



THE UNIVERSITY OF ALBERTA SEIGA RESEARCH TEAM

FINAL REPORT TO THE ALBERTA GAMING RESEARCH INSTITUTE ON

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## The Socio-Economic Impact of Gambling in Alberta

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*Authors:*

Brad R. HUMPHREYS

Brian P. SOEBBING

Harold WYNNE

John TURVEY

Yang Seung LEE

May 25, 2011

# Acknowledgements

This report represents a significant amount of effort on the part of the Edmonton research team. We have collectively spent thousands of hours over the past two and a half years working on this project. Because of this, we thank our wives and significant others for their understanding and support: Jane, Chelsea, Joan and Lynne—thanks for putting up with us!

At several points in this report we make use of population survey data for the Province of Alberta. Professor Robert Williams of the University of Lethbridge designed the survey, contracted with a survey research firm to carry out the work, and oversaw the entire process. We thank Professor Williams for this work, and acknowledge his contribution. Jennifer Arthur of the University of Lethbridge calculated the driving distance between the residence of each individual in these surveys and the nearest casino. This was a tedious and time consuming process, and we thank her for her work. The survey research firm Consumer Contact in Toronto administered both the population surveys carried out as part of this research project. We thank all the individuals at Consumer Contact who worked on the population surveys for their assistance in this research. We also use a significant amount of secondary data from Statistics Canada. We are grateful for the help of Anna Bombak, data librarian at the University of Alberta for her help in providing us with much of this data. A large number of people at Statistics Canada work hard to produce excellent, timely data; we thank them for their work.

In addition, we had significant help from a number of individuals in other areas in the report. Significant assistance was provided by Anne Clayton, Carolyn Hague, and the rest of the staff at the Alberta Gaming and Liquor Commission (AGLC), and we are grateful for their help in compiling the gambling specific data used in this report. We are grateful for the assistance of Irene Wong at the Research Data Centre at the University of Alberta for her help with the confidential Labour Force Survey data. Sharon Steil at Horse Racing Alberta graciously allowed us to examine the historical annual reports and other material stored at Horse Racing Alberta's office in Edmonton. Judy Lyons at Horse Racing Alberta was helpful with compiling the horse racing employment data used in this report.

# Executive Summary

This report describes the results of a two and a half year research project focused on analyzing the socioeconomic impact of gambling in Alberta (SEIGA). This report reflects only research performed by a team of researchers at the University of Alberta. A companion report was produced by another research team at the University of Lethbridge. These two reports are intended to be coordinated, in that each contains complementary information about the socioeconomic impact of gambling; a complete picture of the socioeconomic impact of gambling will only emerge from both.

Socioeconomic impact of gambling (SEIG) studies identify relevant areas where gambling affects society, define appropriate indicators that reflect the impact of gambling, estimate values for these indicators through quantitative or qualitative methods, summarize the nature of the impact based on estimates of the indicators, and discuss the implications for society. Generally accepted methods for conducting SEIG studies are still emerging; this study builds on a recent, widely accepted SEIG framework developed by Anielski and Braaten (2008). We extend and adapt this framework to take into account specific features of the gambling industry in Alberta. We assess the socioeconomic impact of gambling in six impact domains: the economic and financial domain, the tourism and recreation domain, the employment domain, the health and well-being domain, the legal and justice domain, and the community domain. In addition, we assess the socioeconomic impact of gambling by type of gambling activity and by geographic area in the province. Table 2.1 on page 40 contains a concise summary of the impact domains and indicators used in this research.

SEIG studies have well-known limitations. Some are avoidable, while others are not. We carefully and thoroughly accounted for all known avoidable problems with SEIG studies while performing this research. Unfortunately, space and time limitations prevent a comprehensive analysis of a subject as complex and pervasive as gambling, and some impacts of gambling defy even the most determined attempts at assessment. Despite these limitations, we firmly believe that the two reports identify and assesses the most important socioeconomic impact. The two reports constitute a complete analysis of the socioeconomic impact of gambling, but not an accounting of the costs and benefits of gambling in Alberta. Identifying and assessing the key socioeconomic impacts lies within the scope of SEIG studies. Adding up the value of the costs and benefits in order to assess the net impact of gambling on society lies outside SEIG studies, because no objective weighting system for costs and benefits exist and no two individuals would agree on a common weighting scheme.

## Summary By Impact Domain

### Economic and Financial Impacts

The value of goods and services produced by firms in the gambling industry in Alberta was about \$477 million in 2006, the most recent year for which data are available. This represented about 0.1% of the total value of goods and services produced in the province in that year. As a point of comparison, the oil extraction industry accounted for about 15% of the value of goods and services produced in Alberta in 2006; the gambling industry is not large relative to other industries. The value of goods and services produced by the gambling industry grew by 30% in inflation adjusted terms over the period 1997-2006. Unfortunately, no data on the value of goods and services produced in the gambling industry exist after 2006.

Participation in gambling is high in Alberta, in absolute terms and compared to many other provinces and US states. More than 60% of Albertans reported participating in some type of gambling in the past year. The most common form of gambling was the purchase of lottery tickets, followed by raffles, casinos and VLTs, and bingo. Gambling participation rates appear to have declined somewhat over the past ten years. The reasons for this decline are unclear. Average spending per participant on gambling was about \$300 per participant in Alberta; this represents 0.40% of total household spending; this represents about the same fraction of household spending accounted for by reading matter like books, newspapers and magazines. Based on data from population surveys conducted as part of this research program, there appears to be little evidence that households borrow money in order to finance gambling expenditure. Slot machine players were 8% more likely to report borrowing money to finance gambling expenditure, and 3% more likely to report having financial distress, but no other type of gambling had any relationship to borrowing or financial distress among households in Alberta. A statistical analysis of historical insolvency and bankruptcy rates suggests that the opening of a new casino was associated with between 1 and 137 additional bankruptcy cases province wide, an increase of about 6.6% in the bankruptcy rate.

Based on data from Canadian Business Patterns, there were 3 casino hotels, 31 establishments classified in the “casino industry” (a classification of firms broader than just the charitable and First Nations casinos in the province), 81 establishments in the “lottery industry” and 60 establishments in a catch-all “other gambling” industry group in 2008. All of these classifications of firms are based on the North American Industrial Classification System; definitions can be found in the report, on page 85. 15 of these establishments employed 100 or more workers.

The \$1.7 billion dollars of provincial government revenues derived from gambling represented 4.7% of own source provincial government revenues in Alberta in 2009. This fraction has been growing steadily over time. Provincial government revenues derived from gambling are highest in Alberta, Saskatchewan, and Manitoba. These government revenues derived from legal gambling are also important because absent these funds, the provincial government would have to raise these funds through other means, primarily through higher taxes and fees. Since legal gambling is a voluntary activity, but taxes and fees are not, government funds raised through legal gambling creates less inefficiencies, in terms of deadweight loss, than the alternative methods of raising government funds.

Clearly, the provision of legal gambling in Alberta entails some direct government regulatory costs. However, budget data cannot be used to estimate this cost, both because the primary gambling regulator in Alberta, the Alberta Gaming and Liquor Commission, regulates both gambling and alcohol, and because most government budget data represent fixed costs like salaries that cannot easily be apportioned to specific activities like the provision of gambling. Just because these costs cannot be easily measured does not mean that they are not important.

We expect that the report from the University of Lethbridge will address other governmental costs through key informant interviews. However, we have not been given access to the results and conclusions in the final report by the University of Lethbridge. Interested readers should consult the Lethbridge report for additional details, when it is made available.

## **Tourism and Recreation Impacts**

Gambling is a recreational activity, and a large number of people travel to visit casinos and horse race tracks all over North America. Evidence from the Travel Survey of Residents of Canada indicates that more than 5 million tourists from outside the province visited Alberta each year in 2007 and 2008, and that almost 300,000 of them, about 5%, reported visiting a casino. Total expenditure by Canadian travelers from outside the province on trips that involved at least one visit to a casino in Alberta was more than \$80 million per year in 2007 and 2008. Of course Albertans also travel outside the province and report visiting casinos in other provinces and in other countries. Albertans spent more than \$90 million per year on travel in Canada but outside Alberta on trips that involved at least one visit to a casino in 2007 and 2008. Albertans spent more than \$300 million per year on travel in the United States on trips that involved at least one visit to a casino in 2007 and 2008.

Although gambling is a recreational activity, based on data from population surveys conducted as part of this research program, participation in gambling does not appear to reduce participation in other types of recreation. Casino gambling also produces intangible benefits, because visiting a casino produces satisfaction beyond the total economic cost of traveling to a casino. Estimates from a travel cost model indicate that visiting a casino produces in excess of \$100 million in intangible consumer surplus in Alberta in each year.

## **Employment Impacts**

The gambling industry currently employs between 4,000 and 10,000 workers in the province. This range represents estimates from three different data sources, Canadian Business Patterns, the Survey of Employment, Payrolls, and Hours, and the Labor Force Survey. The range is large because the surveys define the gambling “industry” differently in terms of the firms included in the industry, because the data sources measure employment using different approaches, and because the gambling industry appears to have relatively high turnover in employees. This estimate includes employees at all establishments in the gambling industry as defined by the North American Industrial Classification System, a broader measure of employment in the gambling industry than licensed gaming workers. The horse racing industry employs an additional 2,500 workers, although many of these may not be full time jobs. In 2009 the total annual payroll of firms in the gambling

industry was about \$97 million dollars. Both hourly and salaried workers in the gambling industry earn less than gambling industry employees in other provinces.

Employment in the gambling industry has grown steadily over the past 15 years, and the industry provides a significant number of jobs in the province. Most new jobs created in the gambling industry are full time positions, and workers hired into these jobs come from both the ranks of the unemployed and from a representative cross-section of other industries in the province and are balanced in terms of the proportion of males and females hired. In this sense, the gambling industry is well integrated in Alberta's labor market. Job turnover in the gambling industry appears to be relatively high in the province. The average tenure of an employee in the gambling industry is more than one year less than the average tenure of an employee in other industries in the province.

We did not estimate the indirect effect of the growth of the gambling industry on employment in other sectors of the economy in Alberta, due to both lack of access to a easy to implement regional input-output model for Canada and the limitations of this method for estimating indirect employment effects. However, new workers entering employment in the gambling industry earned a wage that was no different from their previous job, and workers leaving employment in the gambling industry earned a higher wage in their new job. Coupled with the fact that most new jobs in the gambling industry are full time positions, this suggests that the gambling industry does not "cannibalize" employment from other industries.

## **Health and Well-Being Impacts**

Our analysis of the health and well-being impacts of gambling was relatively limited. Problem gambling is an important component of any SEIG analysis, especially in this impact domain. We anticipate that research by the University of Lethbridge research team will address problem gambling, and the effect of problem gambling on health and well being in Alberta in considerable detail. However, we have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult the Lethbridge report when it is made available.

We investigated the relationship between participation in various forms of gambling and self-reported happiness, stress, and health, Based on data from population surveys conducted as part of this research program. We found evidence that participation in casino gambling is linked to higher self-reported happiness, and participation in bingo is linked to lower self-reported happiness. Casino gambling makes people significantly happier. We found evidence that participation in casino gambling and slot machine play is linked to reductions in self-reported stress. We also found evidence that participation in slot machine play is associated with an increased probability of self-reported health problems.

## **Legal and Justice Domain**

The relationship between legal gambling opportunities and crime has been investigated in a number of settings. We analyzed historical crime rate data from Alberta to asses the relationship between variation in both VLTs and casinos and crime rates, controlling for other factors that affect crime

rates. We focused this analysis on nine types of criminal activity that could be affected by changes in access to legal gambling: breaking and entering, credit card fraud, other fraud, drug possession, illegal gambling, prostitution, robbery, shoplifting over \$5,000 and shoplifting under \$5,000. This statistical analysis controlled for local labor market conditions and unobservable factors affecting the rate of crime commission. The relationship between gambling and crime appears mixed. Each 100 additional VLTs in a community were associated with between 1 and 11 additional incidents of credit card fraud. However, each additional 100 VLTs in a community was also associated with between 1 and 6 fewer incidents of prostitution, between 1 and 3 fewer incidents of shoplifting over \$5,000 and between 8 and 26 fewer incidents of shoplifting under \$5,000 in communities. Past increases in the number of VLTs in a community were associated with an increase in credit card fraud and a decrease in several other types of crimes. In a similar vein, past increases in casinos were associated with between 2 and 17 additional incidents of robbery and between 1 and 12 additional incidents of prostitution, but they were also associated with a between 7 and 124 fewer incidents of shoplifting under \$5,000 and between 1 and 5 fewer incidents of shoplifting over \$5,000. Based on historical crime rates in Alberta, the association between increased legal gambling and crime has not been uniformly positive. Increasing access to legal gambling may not increase the commission of crimes in communities.

Legal gambling clearly requires additional policing. Casinos, and casino hotels draw relatively large numbers of patrons, and the parking lots at these locations, like the parking lots at shopping malls and airports, are attractive locations for criminals because of the large number of potential targets in a small area. However, we do not estimate incremental policing, incarceration, or security costs associated with legal gaming in Alberta. Although these costs have been identified as potentially important, accounting for legal and justice costs (and benefits) of gambling based on government provision of judicial and police services is difficult to measure, may confuse benefits with costs, and suffers from problems related to the inherent fungibility of government budgets. Even if the total number of crimes in disaggregated categories (robbery, fraud, theft, etc) directly caused by gambling were known with certainty, the operation of the judicial and policing branches of government are characterized by large fixed costs (the salaries of judges, clerks, and police officers represent a large portion of total costs, as do equipment and physical capital) and small variable costs. Fixed costs cannot be easily apportioned across individual crimes or criminals. Also, society clearly benefits from the judicial and policing branches of government; counting spending on these functions as a “cost” seems inconsistent with the societal benefits from these government activities.

We also anticipate that research by the University of Lethbridge research team will address the relationship between gambling and crime. However, we have not been given access to the results and conclusions contained in the final report by the University of Lethbridge. Interested readers should consult the Lethbridge report when it is made available.

## **Community Domain**

Legal gambling in Alberta operates on a charity model. Under this model, certain charitable and nonprofit organizations benefit directly and indirectly from legal gambling. Over the period 1996-2008, more than \$3 billion dollars generated by charitable bingo, casino, pull ticket, and raffle gambling went directly to eligible charitable organizations in Alberta. The allocation of this substantial flow of financial resources was overseen by the Alberta Gaming and Liquor Commission



(AGLC) through the issuance of individual charitable gaming licenses. The annual value of funds flowing to eligible charitable organizations has increased in inflation adjusted terms; the increase can be entirely attributed to increases in charity casino gambling revenues and raffles. Communities in Alberta also benefit from revenues generated by legal gambling through the operation of the Alberta Lottery Fund (ALF). The ALF fund receives funds derived from bingo, VLTs and ticket lotteries in the province and disburses these funds through grants, and through direct transfers to provincial government agencies. Over the period 1998-2009 more than \$15.8 billion dollars of legal gambling revenues were transferred to the ALF. These two sources of funds clearly have a significant impact on the province, and on the lives of Albertans, especially those in need.

First Nations also benefit from funds generated by legal gambling in the province. The First Nations Development Fund is one of the fastest growing components of the ALF, and charity casinos on First Nations reserve land also generate significant charitable revenues. We have not been given access to the results and conclusions about First Nations gambling contained in the final report by the University of Lethbridge. Interested readers should consult the Lethbridge report when it is made available.

## **Impacts by Geography**

Alberta is a large and diverse province. Population, economic activity, and access to legal gambling opportunities are not evenly distributed across the province. We examine the distribution of VLTs, Lottery Ticket Centres (LTCs), and charitable proceeds across different census divisions in the province.

The more populous areas generally have fewer overall gambling opportunities and more alternative entertainment options. The distribution of VLTs per thousand persons is greatest in census divisions with relatively small populations. Less populous census divisions have a relatively high concentration of VLTs per capita. The spatial distribution of net VLT sales essentially track the higher distribution of machines per 1000 population in census divisions. In per capita terms, gambling is relatively more popular in rural parts of the province. The same is true for the location and net revenues from LTCs, although the distinction between sparsely and densely populated census divisions is not so large. This pattern suggests gambling has a strong recreational and entertainment component, as rural areas have fewer recreational opportunities than urban areas, outside of home-based entertainment like television and the internet. The charitable gambling model, and the ALF appear to allocate charitable funds relatively evenly across the province. Since the size of these charitable funds are relatively large, this means that the overall benefits of these funds, in terms of community projects and organizations financed and the additional community-based benefits generated by these activities, are also evenly distributed over the province.

## **Impacts by Type of Game**

We generate a socio-demographic profile of participants in each type of gambling activity using data from the population surveys carried out as part of this research program. Each game attracts a distinctly different participant. The heterogeneous nature of participants in each type of gambling shows that different types of gambling should not be grouped together when assessing the



socioeconomic impact of gambling. It is important to examine each type of gambling separately when considering the effects of some policy change, or the effect of a change in access to different types of gambling activity on society. Of course problem gambling incidence rates are likely to differ across types of gambling. We anticipate that research by the University of Lethbridge research team will address problem gambling in Alberta in considerable detail, including a thorough analysis of problem gambling incidence rates by type of gambling activity. We have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult this report when it is made available.

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## Part I

# Introduction: Gambling in Context and in Alberta

# Chapter 1

## Socio-Economic Impact Analysis

This report assesses the socioeconomic impact of gambling in Alberta. The availability of legal gambling opportunities has increased steadily throughout the world in recent decades, including in Alberta. Gambling, unlike other entertainment and leisure activities—watching television, for example—can potentially have both positive and negative consequences for individuals and society. The increase in access to legal gambling, combined with the potential positive and negative effects of gambling, makes the periodic assessment of the overall effect of gambling on all parts of society an important task. In this report, we document and analyze the results of a three year investigation into a number of important dimensions of gambling.

This is not the first socioeconomic impact study of gambling to be undertaken in Canada, or elsewhere. It is not the first research focused on the positive and negative consequences of gambling in Alberta. But it is a relatively comprehensive and current analysis of gambling, and the gambling industry. Over the past two years, the research team examined other socioeconomic impact studies of gambling, thought carefully about the role of gambling in society, identified those factors that, in our opinion, represent the most important positive and negative impacts of gambling in Alberta, and worked diligently to assess these impacts. Gambling is too complex and extensive a phenomenon to analyze completely; limits of space, time, and the reader's attention would not allow for a fully comprehensive analysis of the positive and negative impacts of gambling on society. Instead, we focused the report on the most important and relevant socioeconomic impacts of gambling in Alberta.

### 1.1 About Socioeconomic Impact Assessments

Humans enjoy gambling. The historical record contains ample evidence of gambling taking place in ancient cultures. Anthropologists report gambling taking place in cultures all over the globe. Other

activities, like eating, drinking, communicating, procreating and others, also take place across cultures and over time, but, unlike gambling, these activities are not voluntary. Any voluntary activity widely undertaken by people since the dawn of civilization, and pervasively undertaken across cultures and societies, must provide some sort of fundamental enjoyment. Note that gambling, like necessary activities potentially has negative consequences for individuals and society in certain circumstances.

Opportunities to gamble have increased all over the world in past decades, governments have expanded legal gambling opportunities, and the development of the internet brought many different gambling opportunities into the home. This expansion also took place in Alberta, which changed from a province with little or no gambling opportunities as recently as the 1970s to a province with many charity and First Nations casinos, electronic gambling machines in bars and lounges, bingo halls, horse racing tracks with slot machines, and thousands of lottery outlets offering instant lottery tickets, high jackpot lotto games, and sports betting in nearly every corner of the province. Governments increasingly permit, and actively engage in, the expansion of legal gambling activities. Given the increase in sales of gambling goods and services that accompanied this increase in gambling opportunities, consumers appear to have an appetite for gambling. In addition, gambling affects many different parts of the provincial economy and society. The growth in government sponsored and provided gambling opportunities, and in demand for gambling goods and services, makes it important to assess the overall impact of gambling in the province. Socioeconomic impact assessments of gambling are an important tool for understanding the role of gambling in Alberta.

Socioeconomic impact assessments are, by nature, difficult to perform. Gambling affects many different segments of society, affects them differently and asymmetrically. Gambling, like driving, drinking, eating, and other commonly performed activities has both positive and negative effects on society. These effects extend well beyond simple monetary transactions. Our perception of different impacts of gambling also differs. Estimates of problem gambling rates periodically make headlines in the local news, while at the same time millions of Albertans regularly participate in legal gambling activities that generate important consumption benefits, satisfaction from partaking in an enjoyable entertainment activity, with no adverse consequences to themselves, their families, or society. A thorough socioeconomic impact analysis must address all these dimensions of gambling. The heterogeneous nature of the impacts of gambling on society make comparisons difficult, if not impossible. Despite these difficulties, socioeconomic impact assessments of gambling are important, and can fulfill a valuable role by informing the public debate about gambling. The key implication of these difficulties is that the results of any socioeconomic impact of gambling study must be interpreted carefully and fully. The whole of a socioeconomic impact analysis is larger than the sum of its parts, and individual components should not be scrutinized in isolation.

## 1.2 Assessing Gambling

### 1.2.1 Problems with Socioeconomic Impact Analysis

Socioeconomic impact studies of gambling are still in their infancy, in research terms. Until research methods in this area mature, any complete socioeconomic impact analysis must address the potential limits to this endeavor fully and frankly. In a 2007 issue of the *American Journal of Economics and Sociology*, Walker (2007) discussed the problems inherent in quantifying the social benefits and costs of gambling. Since quantification forms the bedrock of any socioeconomic impact analysis, Walker's (2007) critique carries special weight in the debate about socioeconomic impact methods. Walker (2007) pointed out the importance of understanding the problems associated with quantifying social benefits and costs associated with gambling in order to avoid misinterpreting the results of socioeconomic impact studies and misinforming both policy makers and the public as to the costs/benefits of gambling within any jurisdiction. This caveat clearly applies here.

Walker (2007) identified four potential problem areas in socioeconomic impact studies of gambling. The first, biases on both sides of the debate about the provision of legal gambling opportunities, commonly arises in the debate surrounding casino gambling, where researchers on both sides take strong *a priori* positions about the appropriateness of legal gambling and do not let the data speak for its self. The second involves the quality of socioeconomic impact research in scholarly terms. He observed that, since most socioeconomic impact of gambling research takes the form of public reports, book chapters, and conference presentations, the research was not subject to the academic peer-review process. As this caveat applies to our study, we address this point in detail later in this report.

The third problem identified by Walker (2007), and perhaps the most important, relates to measurement of costs and benefits. Here, Walker (2007) identified four specific areas related to measurement requiring caution: the counterfactual scenario underlying socioeconomic impact analysis, the problem of comorbidity, the relationship between government expenditure and social costs, and the validity and reliability of survey data used in socioeconomic impact studies. In many socioeconomic impact studies, researchers attempt to identify the opportunity cost of building a new casino or determine the effect of some type of gambling on employment. These questions are difficult to answer because the answer depends, in part, on the "What would have happened" proposition, sometimes called a counterfactual. Unfortunately, this problem is impossible to mitigate effectively; we cannot know what Albertans would do if gambling were eliminated in the province; we cannot determine where the resources put into casino construction would have gone, absent these casinos. We also would not know where many of the government, charitable, and non-profit organizations would have obtained revenue that they currently receive from gambling in order to fund their activities.



The second measurement issue relates to comorbidity, the idea that problem gamblers tend to experience multiple mental and physical disorders. The comorbidities experienced by problem gamblers makes it difficult to determine the costs associated with problem gambling, as the comorbidities associated with problem gambling—substance abuse, mood disorders, etc.—are also costly. This may be the biggest challenge to researchers assessing the socioeconomic impact of gambling. As Walker (2007) points out, most researchers attribute the entire social cost associated with problem gambling to gambling without trying to identify the role played by other disorders. Drug and alcohol abuse are common comorbidities associated with problem gambling, and these problems can lead to many negative outcomes for individuals and society.

The third measurement problem stems from the relationship between government expenditures and social costs. Government clearly incurs some costs stemming from the provision of legal gambling, and a complete socioeconomic impact analysis must address these costs. Past socioeconomic impact studies tended to count all government expenditures on gambling related problems—for example the cost of operating problem gambling treatment centres—as social costs. However, Walker (2007) pointed out that the act of spending money on something does not automatically qualify a publicly provided service as a social cost. Social costs cannot be defined as government expenditure.

The final measurement problem concerns the validity and reliability of surveys and the estimates that are calculated from these data. While survey data can accurately identify problem gamblers, identifying the personal cost of this behavior from survey data is difficult, because money is fungible. It is difficult for an individual responding to a survey question to accurately identify the source of any money lost gambling; it is more difficult to ascribe financial problems like bankruptcy entirely to gambling based on survey data. Survey data has its uses, and this report makes use of survey data; Walker (2007) cautioned against too much reliance on data from surveys to assess the costs of gambling. This report makes extensive use of secondary data to assess costs associated with gambling.

The final set of problems identified by Walker (2007) are, in his terms, unresolved benefit and cost issues. Most socioeconomic impact studies of gambling focus on cost estimation. However, gambling also produces a wide variety of benefits, and quantifying these benefits can be difficult. Among the benefits typically overlooked or mis-measured, Walker (2007) identified (1) failure to account for the net value of gambling related tax revenues, in terms of the opportunity cost of raising those funds by another tax source, (2) failure to accurately measure the employment and income effects of casinos, and (3) failure to estimate consumer surplus and value the benefits of entertainment product variety associated with gambling, as the biggest omissions from socioeconomic impact studies. Walker (2007) also pointed out the many difficulties associated with defining social costs.

In summary, Walker (2007) identified several important potential problems with socioeconomic impact of gambling studies. We have kept these caveats in mind over the past three years, and

have made a determined effort to avoid them. Since Walker (2007) points out that some of these problems cannot be avoided, we also made a determined effort to acknowledge the existence of these unavoidable problems when they appear in the report.

## **1.3 Methodological Principles**

### **1.3.1 The SEIG Analytic Framework**

The methodology for performing socioeconomic impact studies of gambling, while young, is also evolving rapidly. No standard methodology has yet emerged, even though efforts have been made to develop standard methods. In this report, we adopt many of the ideas from Anielski and Braaten's (2008) socioeconomic impact of gambling (SEIG) framework. The development of this framework was supported by a consortium of Canadian gambling research, regulation, and treatment organizations. The framework is "designed to help guide researchers and policy makers to measure, assess and report on the social and economic impact" of gambling (Anielski & Braaten, 2008, p. 6). Most importantly for this study, this SEIG framework developed by Anielski and Braaten (2008) was designed with considerable flexibility, so that researchers can tailor the framework to their specific needs. In a sense, this framework identifies a number of key areas where future SEIG studies should focus their attention. The framework does not address the key issue of how to measure the costs and benefits of gambling. It simply provides guidance on where to look for various costs and benefits of gambling. Anielski and Braaten's (2008) SEIG framework is a map that shows researchers where to look for socioeconomic impacts of gambling, not an omnipotent ruler that allows researchers to measure individual impacts.

Anielski and Braaten's (2008) SEIG framework contains six specific impact themes: (1) Health and Well Being; (2) Economic and Financial, (3) Employment and Education, (4) Recreation and Tourism, (5) Legal and Justice and (6) Culture. These impact themes serve as an organizational structure for socioeconomic impact analysis. Each impact theme identified also has specific variables and indicators associated with the impact theme, a useful feature. In keeping with the flexible nature of Anielski and Braaten's (2008) framework, we have modified it significantly, based on our assessment of the issues in Alberta, data availability, and recent advances in gambling research.

### **1.3.2 Walker's Critique of SEIG Frameworks**

Walker (2008c) identified several key issues that arise when assessing the strengths and weaknesses of general SEIG framework that underlies the approach, data identification and collection, and analysis contained in this report. He outlined eight specific problem areas in any SEIG framework: the

implicit tradeoff between flexibility and comparability, reliance on Genuine Progress Index (GPI) measures instead of Gross Domestic Product (GDP) measures, potential methodological biases generating underestimates of the benefits from gambling, measurement problems, incorrect attribution of gambling costs, questions about the ability of specific measures to answer the overall research questions posed, the strength of the SEIG framework relative to other alternative methodologies, and the lack of peer-review of SEIG studies. Below, we expand upon some of these issues and address how this report attempts to answer these criticisms.

Our analytical framework is based on an interdisciplinary, mixed methods approach to the analysis of the impacts of gambling. While this is a beneficial strategy to undertake, it remains open to a number of the problems identified by Walker (2008c). The first relates to the comparability of this study to other socioeconomic impact studies. Our approach uses some of the six impact themes identified by Anielski and Braaten (2008), but also adds additional areas of focus, based on specific features of the gambling environment in Alberta. This prevents a detailed, point-by-point comparison of this study with others based on Anielski and Braaten's (2008) framework. The second problem identified by Walker (2008c) is that the flexibility inherent in SEIG studies can produce biased conclusions. Different disciplines define gambling-related terms and concepts in different ways, potentially leading to systematic bias in accounting for both costs and benefits of gambling, depending on the disciplinary background of the researchers and the intended audience of the research. The research team for this SEIG project recognizes these two potential problems. In selecting areas of focus, we have attempted to make the impact domains used here as comparable as possible to the impact themes identified by Anielski and Braaten (2008) and other SEIG analyses based on Anielski and Braaten's (2008) framework, while at the same time offering new, alternative methods for conducting a SEIG analysis. The SEIGA research team contains researchers from a variety of disciplinary backgrounds and perspectives. However, unlike most other SEIG studies, this study of the socioeconomic impact of gambling in Alberta was undertaken by a number of researchers with a primary grounding in economics. The research team also contains members with a background in leisure and recreation research and policy studies. This particular makeup of the research team clearly affects the approach, and tenor of the report. While we have tried to maintain an interdisciplinary approach, a leopard cannot change his spots, and we simply acknowledge the strong influence of the discipline of economics in this report. Economists' perspective on the assessment and measurement of costs and benefits differs from most other disciplines. The nature of these differences will probably be apparent to anyone who has read a SEIG report.

Walker (2008c) noted that the SEIG framework is likely to generate impact assessments biased towards anti-gambling findings. This potential for bias stems from the fact that the SEIG framework fails to account for consumer surplus generated by gambling among the benefits. Consumer surplus is the difference between the amount that consumers would be willing to pay for a good or service and the actual price paid for that good or service. Walker (2008c) shows that consumer surplus is important in gambling research for two reasons. First, the overall price of gambling is reduced when

more gambling activities are introduced in a specific area. For example, the opening of another casino in the province would reduce the overall price of gambling faced by consumers of gambling services in the province, increasing the consumer surplus generated by gambling. Second, bundling clearly exists in the operation of gambling businesses such as casinos. The opening of new casinos typically results in the opening of new hotels and restaurants nearby, allowing consumers to bundle their gambling experience with hotel stays, meals, and other consumer goods and services. These bundled benefits generate additional consumer surplus from gambling activities. For the SEIGA project, we estimate consumer distance surplus using data from the Travel Survey of Residents of Canada supplied by Statistics Canada and from the population surveys carried out as part of this research project. The model used to analyze these data permits estimation of consumer distance surplus for casino patronage. While this does not capture all of the consumer surplus generated by gambling in Alberta, it does represent an improvement in the framework.

Walker (2008c) and Anielski and Braaten (2008) both discuss measurement problems associated with socio-economic impact studies of gambling. The problem extends beyond measurement, in that finding good sources of data to measure socioeconomic impacts also represents a significant problem. The SEIGA project encountered similar problems in identifying appropriate data sources for some of the impact areas. In preparing the final report, we believe that we have found the best data sources that are currently available in Alberta. The data are drawn from many sources including national and provincial government organizations and secondary sources. Another problem area in SEIG studies identified by Walker (2008c) is the problem of comorbidities associated with problem gambling. Clearly, problem gamblers represent an important source of costs in socioeconomic impact studies. However, research on problem gambling clearly indicates that problem gamblers exhibit comorbidities—other mental and physical health problems like substance abuse, personality disorders, depression, anxiety, and others—that contribute to the societal costs generated by these individuals. The presence of comorbidities is a problem in SEIG studies because these factors are difficult to separate from problem gambling, yet they also lead to socioeconomic costs. No method for apportioning socioeconomic costs across problem gambling and its associated comorbidities currently exists, and attributing all the socioeconomic costs of this group of related problems clearly overstates the cost to society of problem gambling.

The final problem with SEIG analysis identified by Walker (2008c) is that most or all SEIG reports, while funded from public or government sources, do not go through a peer-review process. The peer-review process is a well established quality control mechanism in nearly all research disciplines and plays a key role in ensuring that new research is sound and contributes to the general body of knowledge in a specific area or areas. Since the final output of socioeconomic impact studies are for public use, and for use by regulators, these SEIG reports typically do not go through the peer-review process. The SEIGA project will be peer-reviewed in an arrangement with the Alberta Gaming Research Institute. In addition, to date the SEIGA project has 1 paper accepted in a peer-reviewed academic journal and several other papers ready to be submitted for

consideration at peer-reviewed academic journals. This provides additional validation of individual components of the SEIGA study.

## **1.4 Present Study**

### **1.4.1 Objectives and Research Questions**

This project examines the socioeconomic impact of gaming in Alberta using a modified SEIG framework. From our original proposal, the research team identified seven specific research questions to guide our inquiry into the socioeconomic impact of gambling in Alberta:

1. What are the nature, characteristics and magnitudes of the social and economic impacts of legalized gambling in Alberta?
2. Do geospatial patterns exist in these impacts?
3. Do the socioeconomic impacts differ as a function of type of gambling?
4. What, if any, relationship exists between gambling availability and gambling impacts?
5. Have the socioeconomic impacts of gambling change over time?
6. Which specific individuals, groups, organizations and sectors benefit most and least from legalized gambling in Alberta?
7. What do the data suggest about potential future impacts of gambling expansion or contraction?

### **1.4.2 General Approach**

The development of our analytical framework, research questions, data collection strategies, methods, and analysis have roots in the multiple (mixed) methods research approach. The SEIG framework identifies the areas where gambling affects society. Based on the specific areas identified in the SEIGA framework, we identified methods of assessing the impact in each area, data sources, and approaches appropriate for each. In some cases secondary data were clearly available to assess the impact of gambling in that area. For example, the CanSim II database maintained by Statistics Canada contains information on the value of production by firms in the gambling industry in each province. In other cases, secondary data existed that would help to assess impacts. For example,

the Labour Force Survey contains some information on workers moving into and out of employment in specific industries. We also designed two population surveys to collect primary data in the province based on the SEIGA framework. Finally, we identified some areas that defy quantification, and employed qualitative methods like key informant interviews to assess the impact in these areas.

Following the data collection phase, the data analysis phase focused on answering the seven research questions identified above. Report writing focused on interpreting the results from the data analysis to answer the seven questions listed above.

This report minimizes the use of the terms “cost” and “benefit” where possible, unlike the terminology used in many other socioeconomic impact studies. This reflects an attempt to avoid developing detailed cost and benefit estimates. We document, examine and sometimes estimate “impacts” associated with certain domains, gambling types, or geographic areas. This may seem like a subtle distinction. However, by using the appropriate terminology we can report the impacts in the most appropriate and consistent way for the specific topic at hand, rather than restricting the analysis to dollar amounts arrived at by dubious assumptions and approaches.

### 1.4.3 Data Sources

The research undertaken in this project used both secondary and primary sources. Below we describe the major secondary and primary data sources used in this project in general. Detailed descriptions can be found throughout the report, where necessary.

#### Secondary Data

**Statistics Canada** Statistics Canada is the main source of secondary data that we use for the report. It is the main statistical agency of Canada and provides researchers with a wealth of data that examines everything related to the behavior of Canadians. It also provides the demographic and industrial information necessary to conduct secondary data analysis. Statistics Canada also administers surveys regarding specific aspects of Canadian living. Some of these surveys we use throughout the report and provide detailed descriptions when they arise in the report. The list below contains the secondary data sources used in the final report.

1. CanSim II
2. Canadian Business Patterns
3. Survey of Employment, Payrolls, and Hours

4. The Survey of Household Spending
5. The Travel Survey of Residents of Canada
6. Labour Force Survey
7. Uniform Crime Reporting Survey

Through the Data Liberation Initiative (DLI), we were able to obtain the public use files for all four surveys. For the Labour Force Survey, the research team submitted a request to access the confidential Labour Force Survey data specifically for this project. These surveys provided us with an opportunity to perform a detailed analysis of the effect of gambling on the province.

## **Primary Data**

**Provincial Agencies** A number of provincial agencies and organizations provided us with annual reports and other official documents. These documents represent a rich source of information on gambling in the province. The list below contains the provincial agencies and organizations who provided reports.

1. Horse Racing Alberta
2. Alberta Gaming and Liquor Commission
3. Alberta Lottery Fund
4. Northlands Park

**Alberta Gaming and Liquor Commission** The Alberta Gaming and Liquor Commission (AGLC) provided the research teams with some very specific information regarding gambling throughout the province. From AGLC, we received detailed information on VLTs and Lottery Ticket Centres not to mention the rich secondary data present in the AGLC annual reports.<sup>1</sup> These data provides the research team with the ability to present geographical profiles of census divisions regarding the availability of gaming products in the province along with providing detailed impacts by these games that will be useful for both the agency and public policy makers. This analysis and subsequent presentation the research team will be something that has not been presented in other socioeconomic impact studies on gaming in Canada.

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<sup>1</sup><http://www.aglc.gov.ab.ca/publications/annualreports.asp>



**Horse Racing Alberta** Horse Racing Alberta provided detailed data on the horse racing industry in Alberta. The annual reports from Horse Racing Alberta provided the research team with both a current and historical overview of the importance and popularity of horse racing in the province. We also received employee licensing count data From Horse Racing Alberta that gives the group its only comprehensive assessment of gambling related employees. A more detailed explanation occurs in the Employment Chapter, Chapter 7, in Section 7.4 on page 142.

**Population Surveys** Population surveys are an important part of socioeconomic studies of gaming. An integral part of the final report are the two population surveys we conducted. The first survey took place in mid 2008 and the second survey took place in mid 2009.

For the population surveys, we used two media to contact survey participants. One is the traditional computer assisted administered telephone interview. In this medium surveys are conducted using a random digit dialing technique. The reason for using the random digit dialing technique is it provides the best opportunity to get a representative sample of the target population, in this case the Province of Alberta. In recent years, contacting people through this medium has been called into question by some researchers for two reasons. First, more people now eliminate landline telephones and use only mobile telephones and voice over internet protocol (VOIP) “phones.” Second, people with landline telephones screen calls, making contact difficult. These factors lead some people to question the validity of participant responses from landline telephone surveys and also raises concerns about whether landline telephones are the best medium for generating a representative sample. As a result, researchers have been experimenting with internet surveys as a medium to solicit a more representative sample (Humphreys, Soebbing, & Williams, 2009).

The SEIGA population surveys used both methodologies (online and landline telephone) to contact survey participants. The population surveys questioned participants in four main areas:

1. attitude towards gambling
2. participation in gambling activities over the past year. These gambling activities include lottery tickets, instant win lottery tickets, sports betting, bingos, VLTs, slot machines, casino table games, and horse racing.
3. Gambling Problems
4. Comorbidities (examples include smoking, drinking, recreational drug use, and depression)

Results and analysis from the population surveys will be used throughout the report. Appendix B describes the data and the coverage of the survey.

**Key Informant Interviews** A number of key informant interviews were performed. Detailed information on these interviews, and the methods used, can be found in the University of Lethbridge volume of the SEIGA report.

#### 1.4.4 Data Analysis

Another important aspect of a multiple (or mixed) methods research strategy are the analytical approaches used to analyze the primary and secondary data. In this project, we use both quantitative and qualitative data analysis techniques. We outline these techniques below.

**Quantitative Analysis** The report uses multiple quantitative methods to analyze the secondary data obtained from Statistics Canada, AGLC, and Horse Racing Alberta as well as the primary data from the population surveys. In the report, we report summary statistics like means, standard deviations, frequencies, and proportions. In other places we use multiple regression analysis to quantify one variable's impact on another variable. For example, we use year-to-year variation in the number of VLTs in province to explain observed variation in the number of personal bankruptcies in the province, controlling for other factors known to affect bankruptcies. We explain in detail our methods throughout the report as well as in the technical appendices found at the end of the report. Technical Appendix D on page 317 contains a detailed description of the panel regression models used in this report. Technical Appendix E on page 325 contains a detailed discussion of the instrumental variables (IV) analysis used with the survey data. Technical Appendix F on page 342 describes the travel cost model used in Chapter 6.

**Qualitative Analysis** All of the qualitative analysis was performed by the University of Lethbridge research team. Detailed information on these qualitative methods used can be found in the University of Lethbridge volume of the SEIGA report.

## Chapter 2

# The SEIGA Framework

### 2.1 Description of the SEIGA Framework

Our analytic framework builds on the work done by Anielski and Braaten (2008). We draw heavily from Anielski and Braaten’s (2008) framework, although the SEIG framework developed here assesses the impact of gambling in the six specific impact domains, which differ from Anielski and Braaten’s (2008) impact themes in both scope and content. Our extension of Anielski and Braaten’s (2008) SEIG framework is consistent with the intent expressed in that document. As Anielski and Braaten (2008) note, the “framework is expected to evolve through ongoing application of the analytic tools, the development of specific impact indicators, and the analysis and interpretation of the impact results” (p6). We attempt to contribute to that evolution with our framework developed for this research project.

It is important to recognize not only the strengths of our framework but also to recognize its limitations. One limitation is that, while our domain themes are important and necessary, they examine a limited number of dimensions of gambling’s impact on society. Our framework also contains two additional dimensions of gambling impacts not included in Anielski and Braaten (2008). The first dimension is impacts by specific type of game. VLTs, lottery, casino gambling, and all other types of gambling have different and unique characteristics and generate different benefits and costs in society, for participants and non-participants. For example consider the impacts of a casino and sports betting. A casino will have different impacts than sports betting because casinos attract people from different provinces and countries to come and participate in casino gambling in Alberta, while sports betting does attraction people from outside the province. Casino gambling will affect different sectors of Alberta’s economy than sports betting. In addition, the characteristics of sports bettors and casino gamblers in the province differ, leading to different impacts on participants. As a result, we felt it important and necessary to perform an assessment

of the impact of gambling by game type. Part of the analysis of examining the impact by game type is to examine the demographic profile of players of that game, how the revenues from these games are distributed, and the current trends regarding the specific game. This analysis begins with Chapter III.

The second dimension we add is an impact assessment of the impact of gambling by geography. Alberta is a large province with two major metropolitan areas (Calgary and Edmonton) that comprise almost two-thirds of the overall 2009 provincial population.<sup>1</sup> The province also contains large, sparsely populated regions. Given this geographic diversity, we believe that it is important to study gambling's impact by specific geographic boundaries, be it the entire province, census divisions, or major cities and centres in the province. This spatial analysis can be found in Chapter IV.

Anielski and Braaten (2008) also observes that one of the key limitations of SEIG studies is “the availability of the proper statistical and qualitative data to populate the recommended indicators” (p. 58). Our framework, and this report, are no different as we face the same difficulty finding specific secondary data that reflects the impact of gambling at a level acceptable for conducting a SEIG analysis and generating appropriated primary data. However, the researcher team identified a number of excellent sources of secondary data not used before in a SEIG analysis which, combined that with the primary data, provide a strong foundation for this report. More details can be found in Section 1.4. Even though our secondary and primary data sources are not “perfect,” we believe they permit a strong and thorough analysis of the impacts of gambling on society, including impacts across games types, domains, and geographical areas.

## 2.2 The SEIGA Framework and Impact Indicators

Anielski and Braaten (2008) presented their SEIG framework in tabular form showing impact themes and indicators. In the spirit of that concise and informative presentation, Table 2.1 summarizes the six impact domains that make up our SEIGA framework and the indicators used in each impact domain. In addition, Table 2.1 shows the section and page where each indicator is discussed in the report. Table 2.1 serves a both a concise summary of the SEIGA framework developed by the research team and an overview of the structure of the report.

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<sup>1</sup>Census Metropolitan Area population taken from <http://www40.statcan.gc.ca/l01/cst01/demo05a-eng.htm>.

Table 2.1: SEIGA Framework and Indicators

Impact Domain	Impact Indicators	Exp. Effect	Notes/ Section
Economic & Financial	Gambling GDP	+	5.1 p. 65
	Personal/household expenditures on gambling	+	5.2 p. 66
	Bankruptcy (personal)	-	5.4 p. 72
	Bad debts (personal, household)	-	5.4.3 p. 81
	Costs to recover bad debts	-	5.4.1 p. 76
	Net business sector growth	+/-	5.6.2 p. 87
	Producer surplus from gambling	+	See Note 2.3.1
	Bankruptcy (commercial)	-	See Note 2.3.2
	Government gambling revenues	+	5.7.1 p. 91
	Direct regulatory costs related to gambling industry	+/-	5.7.2 p. 94
	Government defensive expenditures	-	Lethbridge Volume
	Incremental social service program expenditures	-	Lethbridge Volume
	Incremental public infrastructure costs	-	Lethbridge Volume
Tourism & Recreation	Change in property values	+/-	5.5 p. 84
	Gambling patronage (participation rates)	+	6.1 p. 102
	Tourist expenditures on gambling venues	+	6.2 p. 103
	Consumer surplus from gambling	+	6.3 p. 106
Employment	Gains from gambling as a leisure activity	+	6.4 p. 110
	Gaming industry employment	+	7.2 p. 118
	Gaming industry payroll	+	7.2.2 p. 119
	Net job creation (net job loss) in gaming industry.	+/-	7.2.2 p. 119
	Indirect employment related to gaming industry	+	See Note 2.3.3
	Unemployment/underemployment from gaming industry	+/-	7.3 p. 133

Impact Domain	Impact Indicators	Exp. Effect	Notes/Section
	Characteristics of Workers Hired in the Gaming Industry	+	7.3.1 p. 133
	Productivity losses and absenteeism	-	Lethbridge Volume
	Employment losses in other industries	-	Lethbridge Volume
Health & Well-being	Problem gambling prevalence	-	Lethbridge Volume
	Morbidity and disease	-	Lethbridge Volume
	Premature mortality	-	Lethbridge Volume
	Stress, anxiety and depression	-	8.3 p. 155
	Suicide (thoughts, attempts, actual)	-	Lethbridge Volume
	Social isolation	-	Lethbridge Volume
	Loss of quality time with family, friends, community	-	Lethbridge Volume
	Substance abuse related to gambling	-	Lethbridge Volume
	Psychological impacts on family, friends of gamblers	-	Lethbridge Volume
	Family break-up (separation, divorce, impact on kids)	-	Lethbridge Volume
	Domestic violence	-	Lethbridge Volume
	Citizen attitudes towards gambling and gaming venues	+/-	Lethbridge Volume
Legal & Justice	Reduced crime rates	+	9.2 p. 165
	Crime related to gambling (e.g. embezzlement, fraud)	-	9.2 p. 165
	Policing and incarceration costs	-	See Note 2.3.4
	Judiciary costs	-	See Note 2.3.4
	Private security costs	-	See Note 2.3.4
Community	Local charity/non-profit dependence on gaming revenues	+/-	10.1 p. 174
	Other public sector dependence on gaming revenues	+/-	10.2 p. 178
	Loss of community social cohesion	-	Lethbridge Volume
	Sense of safety from gaming venues	+	Lethbridge Volume
Geography	Spatial distribution of VLTs and sales	+/-	19.2.1 p. 259

Impact Domain	Impact Indicators	Exp. Effect	Notes/ Section
	Spatial distribution of LTCs and sales	+/-	19.2.2 p. 267
	Spatial distribution of charitable gaming proceeds	+	19.3 p. 270
	Spatial distribution of ALF grants	+	19.4 p. 275
Type of Activity	Casino supply, demand, charitable revenues	+/-	11.1 p. 193
	Casino problem gambling	-	Lethbridge Volume
	Slot Machine supply, demand, charitable revenues	+/-	11.2 p. 199
	Slot Machine problem gambling	-	Lethbridge Volume
	VLT supply, demand, charitable revenues	+/-	12.1 p. 203
	VLT problem gambling	-	Lethbridge Volume
	Lottery supply, demand, charitable revenues	+/-	13.1 p. 215
	Lottery problem gambling	-	Lethbridge Volume
	Horse racing supply, demand	+/-	14.1 p. 223
	Horse racing problem gambling	-	Lethbridge Volume
	Bingo supply, demand, charitable revenues	+/-	15.1 p. 233
	Bingo problem gambling	-	Lethbridge Volume
	Instant win supply, demand, charitable revenues	+/-	16 p. 238
	Instant win problem gambling	-	Lethbridge Volume
	Sports betting supply, demand	+/-	17 p. 248
	Sports betting problem gambling	-	Lethbridge Volume

## 2.3 Notes on the Impact Indicators

### 2.3.1 Producer Surplus Estimates

We do not estimate producer surplus for the gambling industry. In the standard economic supply and demand model of a perfectly competitive market, producer surplus is the area above the supply

curve and below the market clearing price. Producer surplus is a measure of the difference between the amount that a producer of some good or service pays to produce that good or service and the amount per unit that the good or service can be sold for. For example, lottery tickets could generate producer surplus if the the price that consumers were willing to pay for lottery tickets exceeded the total cost of producing and selling lottery tickets. This is certainly the case, since the takeout rate for lottery tickets is 45% in most settings. Estimating producer surplus requires detailed data on the production of the good or service in question. We lack sufficiently detailed data on the production of gambling goods to estimate producer surplus in this setting.

### **2.3.2 Commercial Bankruptcy**

We do not analyze commercial bankruptcy rates. The personal rates analyzed in Section 5.4 on page 72 contain both individuals and sole proprietorships. Historical bankruptcy data are available from the Office of the Superintendent of Bankruptcy (OSB), and it only provides data on business bankruptcies back to 1998 for economic regions and CMAs in Canada, which provides too short a panel of data to analyze statistically with the panel data models used in Chapter 5.

### **2.3.3 Indirect Employment Effects**

We do not estimate the indirect employment effects of the gambling industry in Alberta in this report. Clearly, the gaming industry does not exist in a vacuum. Inter-industry connections are important features of industrial economies; establishments in the gaming industry purchase goods and services from other industries, and the output of the gaming industry can be viewed as an entertainment good that may have a number of substitutes in consumer demand. The estimate of total payroll in the gambling industry developed below is relatively large, suggesting that employees in the gambling industry have considerable disposable income to spend on other goods and services. In principle, we could use a multiplier approach derived from input-output tables to estimate the indirect and induced employment effects of the gambling industry. However, no easily available regional input-output analysis software currently exists in Canada, and multipliers derived from input-output models have a number of well established limitations. Future research could address this omission.

### **2.3.4 Legal and Justice Costs**

We do not estimate incremental policing, incarceration, or security costs associated with legal gaming in Alberta. Although these costs are identified by Anielski and Braaten (2008), Walker (2007) argued that accounting for legal and justice costs (and benefits) of gambling based on



government provision of judicial and police services is difficult to measure, may confuse benefits with costs, and suffers from problems related to the inherent fungibility of government budgets. Clearly, any attempt to identify incremental costs to the judiciary and police attributable to gambling requires dubious assumptions. Even if the total number of crimes in disaggregated categories (robbery, fraud, theft, etc.) directly caused by gambling were known with certainty, the operation of the judicial and policing branches of government are characterized by large fixed costs (the salaries of judges, clerks, and police officers represent a large portion of total costs, as do equipment and physical capital) and small variable costs. Fixed costs cannot be easily apportioned across individual crimes or criminals. Also, society clearly benefits from the judicial and policing branches of government; attributing spending of these functions to a “cost” seems inconsistent with the societal benefits from these government activities. Based on Walker’s (2007) criticisms, and our assessment of these criticisms, we will focus only on estimating the relationship between gambling and the commission and detection of crime in this analysis, and do not attempt to estimate a dollar value of the benefits and costs of crime in the operation of the judiciary or police force.

Qualitative analysis, in the form of key informant interviews and other methods, can provide important information about perceptions of legal and justice costs associated with gambling. We anticipate that research by the University of Lethbridge research team will address this point. However, we have not been given access to the results and conclusions contained in the final report by the University of Lethbridge. Interested readers should consult the Lethbridge report when it is made available for more information about the legal and justice costs of gambling in Alberta.

### **2.3.5 The Lethbridge Volume**

These sections of the report were to be addressed by the University of Lethbridge SEIGA research team. We were not provided with a copy of the completed volume produced by the SEIGA research team at the University of Lethbridge. However, based on our understanding of the division of labor for this research project, these areas should be discussed in detail in the Lethbridge volume.

## Chapter 3

# Gambling in Alberta: An Overview

### 3.1 Gambling in Alberta

Gambling in Alberta begins with the cultural traditions of the indigenous First Nations communities that predated the arrival of European settlers in the province. Considerable anecdotal evidence suggests that gambling took place in the early days of the province. Appendix A contains a detailed time line of gambling-related events in Alberta, from which the following highlights are drawn.<sup>1</sup> The original values and norms prevailed in Alberta until the mid-1960's, when the first charitable casino event, the Silver Slipper, was held at Edmonton's Klondike Days in 1967, and continued annually. Until that point, the only legal forms of gambling in the province were pari-mutuel wagering on horse racing, legalized in 1910, and bingo games of the type associated with church basements. In the 1970s, sweepstakes sales were permitted. By 1980, sweepstakes and lotteries fell under government control, including variations of the familiar 6/49 lottery games.

In 1980, Alberta's first private casino opened, in Calgary. The following year, Casino ABS opened in Edmonton. ABS stood for "Alberta Bingo Supply," the parent company of the casino. The name was later changed to Casino Edmonton. In 1985, the Criminal Code of Canada was modified to transfer legal gambling authority to provincial jurisdictions. Previously it had been under federal control. In addition, the Criminal Code of Canada legalized computer video (VLTs) and slot machines (Smith & Wynne, 2004). Indeed, as the decades progressed, more casinos were established in Alberta, offering a great deal of competition to horse racing and bingo for Albertans' gambling dollars.

The more controversial video lottery terminals (VLTs) were introduced formally in 1992. Although successful as a form of entertainment and source of gambling revenue, many communities

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<sup>1</sup>This material comes from a table on the Alberta Gaming and Liquor Commission (AGLC) website; <http://www.aglc.gov.ab.ca/gaming/gaminghistoryfacts.asp>

viewed VLTs with hostility. In response to plebiscites, and despite the objections of retailers, VLTs were ‘removed’ from seven communities in Alberta. In the case of Fort McMurray, VLTs were taken out of bars and lounges, and concentrated in the casino. They effectively remained in the community, but as slot machines (permitted in casinos since 1996), and out of bars where it was feared patrons might be more susceptible to developing gambling problems.

With the establishment of casinos and lotteries, and bolstered by the introduction of VLTs, the revenues received by the government of Alberta increased greatly. Responsibility for managing the revenues, setting standards, and maintaining fairness in provincial gaming was transferred to the Alberta Gaming and Liquor Commission (AGLC). Under their oversight, the charitable gaming model was established to ensure that the proceeds and benefits of legalized gambling were returned to the citizens of Alberta. In response to concerns about problem gambling, some of the revenues are directed to agencies that detect and counsel such behaviour, as well as to encourage Albertans to enjoy their gambling options responsibly.

The latest change in Alberta’s gambling landscape was the construction of First Nations casinos on reserve land. The River Cree Resort opened in 2006. There are now five First Nations casinos in Alberta, all of which comply with the AGLC charitable gaming model, but with provisions that allow flexibility in responding to First Nations needs. According to the latest AGLC Annual Report (2009-2010), the province grossed \$1,399,426,000 from casinos, raffles, pull-tickets, and bingos. Almost \$323 million of the gross went to charitable organizations.

In summary, the history of gambling in Alberta began with the indigenous population, and now has been adapted to permit the return of legalized gaming to First Nations’ lands. The lawlessness of the West has been tamed, but the rigid morality that molded its transition has been eroded over the last century to permit a spectrum of alternatives to Alberta’s gamblers. Under the current model, the desire of Albertans to indulge in gambling, evident throughout the history of the province, is met with venues and games that are monitored to ensure fairness, and where responsible gambling is encouraged.

## **3.2 A History of Horse Racing in Alberta**

The origins of horse racing in Alberta are vague and anecdotal. Stories exist about farmers racing for money at harvest celebrations or country fairs as well as reports of horse owners racing Hansom carriages along the streets of Edmonton. In the 1880’s residents raced saddle horses in informal competitions at Rosedale Flats, which is now downtown Edmonton (Northlands Park, nd). Other early reports of horse racing in Alberta come from the Cochrane area in the 1880’s and 1890’s. The Cochrane Racing Association was established in 1894, and a racetrack was built in town soon after

(Archives Society of Alberta, n.d.). Informal races at the Rossdale Flats in the 1880's gave way to more selective and organized competitions in 1905. A track was constructed, with stables and accommodations added in 1910 (Northlands Park, nd).

The Millarville Race Club was formed in 1905 in Millarville, Alberta, holding its first meet on June 23, 1905. Since horse racing in America was illegal during this period, Canadian tracks flourished. In Edmonton, "winter and summer the harness racers would practice their demanding art on Jasper Avenue" (Cashman, 1976, p. 155). In 1900 racing activities were moved from Rossdale Flats to the current site of Northlands Park.

Standardbred, or harness racing (for a detailed description of the breeds of horses and their respective racing formats, please see section 14.1 on page 223) also had early roots in Edmonton, beginning in 1909. It was not until 1952, however, that a dedicated harness meet was scheduled. Harness racing proved to be popular in Edmonton, and today Northlands Park is home to both standardbred and thoroughbred racing. By 1965, harness racing was ready to expand to other centres. The Alberta Racing Commission (ARC) was established to oversee the regulation and operation of horse racing in Alberta. The commission expressed concern about the availability of horses and the preservation of the legitimacy of the sport, but otherwise gave their approval. Indeed, while harness racing grew in popularity in other parts of North America, it was stymied in Alberta. Horses and bettors seemed plentiful enough, but the commission lamented a lack of qualified officials and drivers (Alberta Racing Commission, 1965).

The response of the Commission to the shortage of bloodstock was to take a more active role in encouraging local breeders and horse owners to raise and race Alberta standardbred horses. The incentives were in the form of bonuses for finishing first to fourth in races, thus encouraging not only an increase in the stock of horses, but also the quality of the racers. The Commission also began to match the increase in horses to the spread of racing in the province, subsidizing community racing in the smaller cities of Westlock, Grand Prairie and Red Deer.

Community racing is differentiated by track designation (A - E) depending on their purse sizes. The tracks in Edmonton and Calgary are considered 'A' or 'B' tracks (Churchill Downs and Belmont in the US, for example, are considered 'A' tracks). Community tracks in towns and small cities fall into categories from 'C' to 'E'. Although the purses may be smaller, the rules and regulations apply no less stringently, as fairness must be maintained at all times for all participants from horse owners to bettors. Naturally, the lower purses are less likely to attract quality horses, which gravitate to the higher purses and profile of the 'A' and 'B' tracks.

Other developments in different regions influenced racing and betting in Alberta. Enterprising brokers in Ontario had begun experimenting in the mid 1960s with off-track betting in that province. The businessmen claimed to be simply taking a fee for the service of calling an agent at

the track where the bet was to be placed, and purchasing the requested wager. This activity was a little too much like bookmaking, where an individual offers odds and takes bets on horses, and even though the practice spread briefly to Edmonton and Calgary, the provincial governments successfully lobbied the federal government to prohibit such operations (Alberta Racing Commission, 1970). This experiment, limited though it was, revealed a demand for cross-track wagers, and was a harbinger of things to come—particularly modern simulcast wagering in teletheatres, whereby present day patrons can place bets at any of a number of tracks in North America in real time.

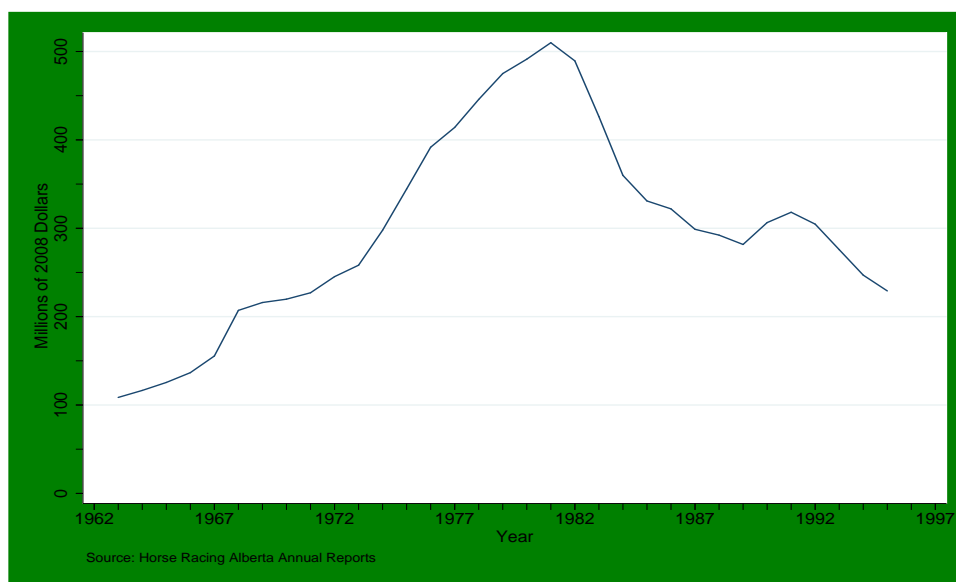
As the 1970s came to a close, ARC assumed control of both harness and thoroughbred racing. Not only was attendance at horse tracks increasing, but also the amounts wagered were increasing. Patrons were betting more per race. The quality of the horses was improving, and Northlands Park positioned itself as one of the leading racetracks in Canada. Indeed, by 1980 Northlands Park boasted the highest per capita wagering in Canada, and horse racing was considered a leading feature of Edmonton life. Although the attendance and wagering records of ARC annual reports was testimony to racing's greater popularity in Alberta's capital city than in Calgary, the latter demanded more summer racing dates than Edmonton held at that time. Despite the strain this would place on the supply of quality horses, the ARC tried to accommodate Calgary in its request.

What followed from this competition between cities, arbitrated by an ambitious commission, was a growing appreciation of the social value of horse racing. Mention has already been made of subsidies to municipalities to encourage racing events. Even while the recession of the early 80's cast a pall on the economy, the first race in Alberta's history with a purse over \$100,000 was held. Pari-mutuel wagers continued to climb in Alberta's community racing meets. In an effort to stimulate this trend the Province of Alberta rebated 2% of revenues from the previous year's total wagers to supplement purses, breeding programs and salaries. The value of racing to local communities was reflected in an offer from the City of Lethbridge and the Alberta Racing Commission to guarantee track losses up to \$21,000 if Whoop-up Downs would continue racing in 1982 after the track had announced plans to discontinue their annual meets. The Commission declared that year, 1982, to be the most successful year in the history of Alberta horseracing up to that point (Alberta Racing Commission, 1983).

The success was not to last, however. Not only was one of the worst recessions in Canadian history wreaking havoc nationally, but the National Energy Program, introduced on October 28, 1980, also exacerbated the impact of the recession on Alberta. As well, the horse racing industry was losing its monopoly on the province's gambling revenues. Table A.1, Gaming History and Facts, in Appendix A shows increased competition from a number of sources around that time. Sweepstakes became a fixture at the Calgary Stampede and Edmonton Klondike Days in the 1970's. In 1975 the first lottery ticket—the Westerner—became available. In the same year, as a precursor to what was to come, the Edmonton Kinsman Club established Alberta's first not-for-profit casino, the Silver Slipper at Klondike Days held at Northlands Park. A privately operated charity casino

opened in each of 1980 and 1981. The Cash Casino opened first in Calgary, and then Casino ABS in Edmonton. Finally, in 1982, already declared Alberta horse racing's most successful year, Lotto 6/49 was launched. The change was dramatic, as shown on Figure 3.1 which shows the annual total value of pari-mutual wagers in Alberta, also called "handle," over the past 45 years, expressed in inflation adjusted terms.

Figure 3.1: Total Parimutual Wagers in Alberta



By 1983 the recession was in full swing, but ARC still recorded the third highest pari-mutuel handle in the history of Alberta horse racing (Alberta Racing Commission, 1984). The province continued its support of horse racing with the rebate of 2% of the previous year's wagers to the industry. In 1984, as the first declines in wagering handles became apparent, the Province of Alberta increased its subsidy of horse racing by a further 2.25%, targeting the exhibitions and fairs that featured horse racing. The commission made note that year of the growing competition from gambling within the province: "Our racetracks must promote vigorously to maintain their market share which is so important to the horse industry, an adjunct to agriculture in the province. (We) will continue to urge exhibitions and fairs to recognize the vital importance of racing to their year-round operations." (Alberta Racing Commission, 1985, p. 6)

The decline in wagering due to the recession, although severe, as shown on Figure 3.1, was not as devastating as originally projected by the commission. For this reprieve, it credited the provincial government's supplementary rebate of 2% directly to the commission. At work behind the scenes was a transfer of gambling revenues from other sources, in this case the lotteries. "The exercise was achieved without cost to the general taxpayer when the former capital grant to racetrack from pari-mutual revenues was replaced by an increase in grants from lotteries" (Alberta Racing Commission, 1987, p. 1). This may have marked the first acknowledgement of compensation of lost wagering

revenues with the proceeds from a competing form of gambling. The rebates financed, among other things, a special bonus of \$500 for first-place Alberta-sired racing horses, and additional bonuses of \$250 and \$125 for second and third place finishers as well (Alberta Racing Commission, 1987).

In its annual report for the 1986 fiscal year, the Alberta Racing Commission explains the case for the increased support in terms of the social benefits of racing: “The Commission and horsemen’s organizations had made representations to the Government for increased support on grounds that horse racing and breeding was a labor intensive form of economic diversification with spin-off as a tourist attraction. Favorable response by the public to the Government’s subsequent action proved the case was valid” (Alberta Racing Commission, 1987, p. 1).

These last few years turned out to be a pivotal time in the history of horse racing in Alberta. The subsidies, generous as they were, led to a rivalry between the racing breeds that continues to this day. The 1985 fiscal year was the first year that standardbred wagers exceeded those of thoroughbreds in the province (Alberta Racing Commission, 1986). That is no longer the case; thoroughbred wagers now greatly exceed that of standardbred, and thoroughbred owners contend that they merit a larger share of the bonuses that have continued to be split evenly between the breeds. While this is true, and at the risk of getting ahead of the chronological narrative, the current wagering distribution is complicated by simulcast wagers, which currently exceed live handles of both breeds. Simulcast refers to the simultaneous broadcast of live racing events at a “host” track to “foreign” tracks. Patrons view these transmissions on multiple screens in ‘teletheatres’, and can make wagers on the outcomes of the races. Foreign tracks pay a subscription fee to the host track for the service. The fee is variable, with marquis events like the Triple Crown races commanding substantial premiums. This will be explained in more detail later, but to return to the current context, the ARC annual report of 1986 made the first mention of simulcast wagering, remarking in a positive note that simulcast races were “beneficial to the industry although there was some doubt whether broadcasting minor races from outside the province was worth the cost” (Alberta Racing Commission, 1987, p. 6). Simulcast transmissions between racetracks originated in Canada in 1982 at the Ontario Jockey Club racetracks (Thalheimer & Ali, 1995). Thus the fiscal year 1986 not only saw racing, and the Alberta economy, begin to emerge from the recession, but also marked a more determined rebate and prize supplement designed to stimulate Alberta’s breeding program (which lay the groundwork for later inter-breed disputes), and witnessed the acceptance of simulcast racing which later came to dominate the industry.

By 1989, the Commission became optimistic that the recession was over for the racing industry. Its sanguine outlook may have been a little premature, given the increased competition from other gaming sources, but in 1990 Alberta boasted the largest increase in provincial wager in Canada, at 14%. This increase was buoyed by the simulcast of races between Calgary and Edmonton as harness and thoroughbred racing moved their meets from city to city. The trend of increased provincial handle continued into 1991 as the simulcast market continued to expand, broadcasting to teletheatres in smaller communities (Alberta Racing Commission, 1992).



Along with the benefits of simulcast, a couple of negative trends became apparent. The first was a decrease in live attendance at the races. The racetrack and horsemen actually make less on televised races than they do on the live races, and the effects of decreased attendance were barely compensated by the simulcast revenues. Purse money is diverted to operate satellite facilities, and hospitality revenue is lost to the track (Alberta Racing Commission, 1992).

These declines were matched by a 3% decline in the 1992 provincial wager. Concerned horsemen were mollified by Alberta's favourable comparison relative to the rest of Canadian provinces. Attendance declined, and the total amount wagered also dropped again in 1993. This placed the remaining community tracks (the numbers had decreased from more than a dozen a decade prior, to three—and these were hard pressed to attract horses and jockeys) in a stressful situation. The Commission levied a 0.5% surcharge on simulcast wagers at the teletheatres to supplement the purses at minor meets in an effort to reverse the decline (Alberta Racing Commission, 1994).

Incidentally, the confluence of technology and the provincial government's interest in the expansion of gambling options prompted an experiment in Lethbridge. The Alberta Lottery Corporation placed slot machines in the grandstand and blacked out Lethbridge's teletheatres on live racing days at Whoop-up Downs. "The decline in betting at the parimutuel wickets almost exactly equalled the amount bet in the slot machines" (Alberta Racing Commission, 1994, p. 3). Nonetheless, the track made a small profit that year. The total amount of wagering in Alberta continued to drop through 1993 and 1994. Live wagering decreased considerably, but was compensated by increases in simulcast betting, as well as intertrack and off-track betting (OTB). By this time the commission had enhanced its simulcast offerings by implementing a network of available betting and viewing sites throughout the province. These measures included:

- *Intertrack betting*: the transmission of signals primarily between two points (Thalheimer & Ali, 1995). For Alberta, those two points were Edmonton and Calgary. From the horse racing annual reports, the two tracks 'traded' breeds at certain points during the racing season. Generally, harness racers would run at Northlands in the spring, while the thoroughbreds enjoyed the facilities at Stampede Park. During the summer meet, the thoroughbreds would run in Edmonton and the standardbreds in Calgary, switching again in the fall. Because the horses at both tracks ran on the same days and in the same time-slots, patrons at both tracks could follow whichever races they preferred.
- *OTB*: these were premises in the metropolitan area of a major track, licensed to transmit wagers to the host track, which would be included in the track totals and consequently pay off according to the track odds (Thalheimer & Ali, 1995; Bygrave et al, 2001).
- *Alberta Teletheatre Network (ATN)*: This was formed in 1991. Its formation was to provide "an opportunity for horse owners, breeders and racing fans to view races and wager within



rural areas as well as providing a convenient outlet for other race patrons who are unable to travel to the racetracks or urban OTB facilities” (Bygrave et al, 2001, p. 21). This venture has not shown much historical success. The establishments were of low quality, lacking identifying traits such as consistent signage, and failed to generate substantial levels of customer satisfaction or appreciation (Bygrave et al, 2001).

The management of horse racing in Alberta had become considerably more complex than it was when the Alberta Racing Commission was formed as a public body to govern the sport and develop the industry. The problems that were developing were also complex, requiring coordinated solutions. For instance, the breeding stock continued to decline, and racing stock and personnel were leaving the province for more attractive opportunities and richer purses in more favourable jurisdictions such as British Columbia and Ontario. The provincial government introduced Bill 5, the Racing Corporation Act, in October of 1995. This bill repealed the Alberta Racing Commission Act, and the Pari-mutuel Tax Act in preparation for the privatization of the regulatory functions of the ARC. The Commission would be replaced by the Alberta Racing Corporation, so the acronym ARC would still stand (Alberta Racing Commission, 1996).

Despite an infusion of \$6.5M from the development fund, and increased contributions from simulcast and OTB wagers, the total wager fell again in 1995 and 1996, as recorded in the last annual report by the Alberta Racing Commission. The following year the Alberta Racing Corporation was pleased to report a small increase in the handle. The emphasis on using the handle, which is the amount wagered in the province, is important because it not only measures the tax revenues and income streams for the tracks, but also a percentage of that amount finances the ARC’s activities, including administering the Development Fund. The Development Fund, in turn, has been increasingly seen as the bulwark of the industry in the province, promoting breed development and encouraging ownership of horses and participation in the sport. 1998 trumpeted the continued increase in slot machine revenues and correspondingly, racing purses (Alberta Racing Corporation, 1999).

Racing entertainment centres (RECs) opened in Edmonton and at Whoop-up Downs in Lethbridge in 1997, and immediately (perhaps not surprisingly) showed a “solid return on investment to the industry” (Alberta Racing Corporation, 1998, p. 1). Of the \$3.4M in new net revenues in 1997, \$1.2M was reinvested in horsemen’s purses (Alberta Racing Corporation, 1998). The casino gaming terminal (CGT) revenue continued to drive purse increases and seemed to have turned the industry around by 2000. In the report for the 2000 fiscal year, Chairman Dr. Pat Brennan reported the first modest increase in racing handle since 1991 (Alberta Racing Corporation, 2001). The origins and operation of RECs and CGTs are discussed below.

Despite the subsidy from RECs, the survival of the industry was by no means assured, and managing its disparate interests, responsibilities and participants did not seem to have been satisfactorily resolved by the privatization of the principal racing body three years prior. *The Alberta*

*Horse Racing Industry Review* was commissioned by Alberta Racing Corporation to review the industry in its entirety and within the context of its provincial and continental competitors. This report was quickly and comprehensively completed within 5 months, and outlined the state of the industry as well as recommendations on how it should proceed. One of the recommendations was the formation of a new governing body, Horse Racing Alberta.

The report was during a pivotal in the sense that it provided a candid assessment of the state of Alberta's horse racing industry. The industry was in disarray. The best horses and horsemen were leaving for greener pastures, and there was little incentive for breeders to continue adding stock. The average cost of bringing a yearling to auction was \$10,750, and yet the average sales price was a little more than half of that. The total purse available to be won was only 30% of the cost to the owners of owning and running their horses. The takeout rates, at 15% on win/place/show wagers and 24.8% of feature bets (exactors, triactors, etc) were not as competitive as they could be. The fields were small, and any race with less than eight horses was less attractive to racing fans. These issues seemed to lead to the conclusion that horse racing was becoming a "labour of love" for owners, breeders and bettors, whose combined resources, financial and otherwise, was sustaining the industry. (Bygrave et al, 2001).

Much of current purse money in Alberta is derived from slot machines at racetracks, as part of the province's Racing Industry Renewal Initiative. Slot machine revenues subsidize the horse racing industry in Alberta. The equity effects of this subsidy are unclear, but the use of revenue generated by slot machine players to subsidize the horse racing industry appears to be the result of intense lobbying by horse racing interests rather than based on any reasonable public policy decision. The slot machines are maintained in an on-track casino that is partitioned off from the racing activities on the track, although they are accessible to all patrons. Called 'racinos' or 'racing entertainment centres' (RECs), these gambling venues have become fixtures at tracks throughout North America. They are licensed in Alberta under the authority of the Alberta Gaming and Liquor Commission (AGLC), from which entity the slot machines are leased. The conditions under which the licenses are awarded varies between tracks and jurisdictions, but in general the prerequisite is that the track's primary business is live harness or thoroughbred racing. In some cases, both breeds—and even quarterhorse racing is stipulated, and the proceeds returned to the track are to be used for purse enhancements.

Using slot machine revenues to subsidize the racing industry may or may not be an appropriate policy. Slot machine customers and horse race bettors may represent different groups of gamblers. However, some slot machine revenues, a source of tax revenues as well as the lifeblood of the horse racing industry, to the extent that without these revenues, live racing in Alberta would be very different and might not exist at all. The government of Alberta retains 33.3% of REC revenues. This amounted to \$28.7 million in 2007. This issue deserves further attention.

The slot revenues from RECs has been in decline, reaching around \$10.00 per hour per machine in 2008, compared to \$12.72 per hour per machine in 2006 and \$10.59 per hour per machine in 2007 (The Horsemen's Benevolent and Protective Association of Canada, 2009, p. 4). Of the net proceeds from RECs, 15% is retained by the host track. This money is to cover the operating and staffing costs of the REC. The balance is forwarded to the provincial government through the AGLC. The Commission retains a third of the net proceeds and in turn forwards the balance, 51.67%, to HRA. Horse Racing Alberta returns 13.33% of the initial net slot revenue to the track for racing operations (Northlands, 2007).<sup>2</sup>

HRA returns a portion of the money directly to the track for purse enhancement. Of the total purse money available to be won from all forms of racing in Alberta (\$29.1 million in 2007), almost \$22 million was paid by HRA. The rest of the purse money comes from wagers and the Breed Improvement Program (BIP). Table 3.1 summarizes the purse funding in Alberta in 2007.

Table 3.1: Funding of Purses in Alberta, 2007

Source	Percent
Wagering	27.5
Breed Improvement Program	9.4
Added Monies Stakes	3.6
HRA Gaming Revenue	59.5

*Source: The Horsemen's Benevolent and Protective Association of Canada, 2009*

HRA also distributes a considerable amount to Alberta's breed improvement program (\$7.7 million in 2007). The BIP is important because there are economic gains from exporting champion racing stock. As it is, with dwindling purses and attendance, the price of foals has fallen and some breeders are leaving the province. The remaining stock is taking a decreasing share of purse money. Alberta purses won by horses bred in the province have declined from 64% in 2003 to 48% in 2006. This is motivating some breeders to send their mares to jurisdictions like Kentucky to be bred with stallions there, imposing heavy costs on local horse-owners as well as hazards to the mare and her foal. The added expense is justified by the difference in prices for American-sired yearlings compared to those sired in Alberta: averaging \$20,000 to \$6,000 respectively, but results in a loss of breeding-related income and employment.

In the case of Northlands Park, we can illustrate the effect of these revenue flows from data available in the 2007 annual report, which is summarized on Table 3.2. When taken together, the fungible nature of government revenues and the complexity of cash flows that constitute the supplements and other funding of the industry, it is difficult to ascertain the tax impacts from the horse racing industry. However, it is informative to note that current tax revenues and other

<sup>2</sup>These percentages can be found on page 69 of the Northlands 2007 Annual Report.

benefits derive from slot machine revenues in RECs without which, in addition to the contribution from horse owners themselves, the industry would not be sustained.

Table 3.2: Northlands Park Revenue Accounting, 2007

	Net	AGLC	HRA
Revenues from Racing	\$40,722,340		
Less Operating costs of REC (15%)	<u>\$6,108,351</u>		
Distributed to AGLC	\$34,613,989		
Retained by AGLC (33%)		\$13,560,539	
Distributed to HRA (52%)		\$21,041,233	
Retained by HRA			\$13,624,015
Returned to Northlands (track operations)			\$ 5,428,288
Capital grant			\$1,088,148
Discretionary grant (0.95% of handle)			\$900,782

*Source: Northlands (2007)*

In summary, horse racing in Alberta has been a prominent form of gambling and more broadly, entertainment in Alberta. It has faced decreasing participation and interest over the last decade, and now relies on slot machine revenues and government subsidies to sustain itself among other gambling and entertainment options. While the horse racing industry may provide some economic benefit to the broader Alberta economy, and money from horse racing is redistributed to more rural areas of the province much of the justification for the continued existence of the industry rests on the rich horse racing history in Alberta and its links to the agrarian roots of the province.

## Chapter 4

# The Structure of the Gambling Industry

### 4.1 Regulation of Legal Gambling in Alberta

Alberta, like all Canadian provinces, bases its gaming regulatory policies on current gaming laws at both the federal and provincial level. The federal regulations governing gambling are contained in the Criminal Code of Canada, to which Alberta's regulatory framework conforms.

In the mid-1980's, amid dynamic changes in both existing and new forms of gambling, the Criminal Code was amended in several key ways. The amendments formalized the transfer of authority over legal gambling from the federal government to the provinces. Pursuant to this transfer, Alberta drew up its Gaming and Liquor Act, which, in turn, established the Alberta Gaming and Liquor Commission (AGLC) in 1995 as the provincial regulator with authority over lottery and gambling activities in the province. The AGLC was given responsibility over both gaming revenues and licensing. The disposition of gaming revenues and conditions of licensing are the primary focus of AGLC's policy making.

While the Criminal Code permitted provinces to choose which lotteries to conduct, and what other types of gambling activities to make available by license to non-profit groups, it also constrained provincial choices somewhat through the inclusion of public-minded provisions. "The primary beneficiaries of gaming must be charitable, non-profit, public and community-based initiatives" (Alberta Gaming and Liquor Commission, 2001, p. A2-3). Essentially the backbone of provincial gambling policy is that all gambling in Canada is illegal unless it is specifically exempted. Notably, exemptions are not applicable to all forms of gambling. Section 207(4) outlines lottery schemes and other gambling activities that are not permitted, as follows:

“...a game or any proposal, scheme, plan, means, device, contrivance or operation described in any of paragraphs 206(1)(a) to (g), whether or not it involves betting, pool selling or a pool system of betting other than

- (a) three-card monte, punch board or coin table;
- (b) bookmaking, pool selling or the making or recording of bets, including bets made through the agency of a pool or a pari-mutuel system, on any race or fight, or on a single sport event or athletic contest; or
- (c) for the purposes of paragraphs (1)(b) to (f), a game or proposal, scheme, plan, means, device, contrivance or operation described in any of paragraphs 206(1)(a) to (g) that is operated on or through a computer, video device or slot machine, within the meaning of subsection 198(3), or a dice game.”

(Source: Alberta Gaming and Liquor Commission, 2001, p. A2-6)

As a consequence of these restrictions, slot machines and craps tables were relegated to casinos or other approved establishments, and the definition of “slot machine” was broad enough to include the variation that was later to become the video lottery terminal, or VLT (Alberta Gaming and Liquor Commission, 2001).

Smith and Wynne (2004) note that “the Criminal Code amendment to permit these activities was made without public input and has been an ongoing source of public controversy ever since” (p. 1). This left the AGLC to interpret and apply common law to Canada’s Criminal Code requirements (Alberta Gaming and Liquor Commission, 2001). For instance, the definition of “charitable purpose” as the object of gaming revenues allocation was vague under the Code, and AGLC adopted the criteria for eligibility as follows

1. Relief of poverty
2. Advancement of education
3. Advancement of religion
4. Other purposes beneficial to the community

(Source: Alberta Gaming and Liquor Commission, 2001, p. A2-10)

The last criterion was again left somewhat open to interpretation, as the Alberta Gaming and Liquor Commission (2001) states, “such purposes are subject to change with social priorities” (p. A2-10). To resolve the debate in a public forum, and rectify the lack of public input in the

changes to the Criminal Code, Alberta's Lottery Review Committee was established to undertake public consultation. Recommendations from this exercise led to the formation of the AGLC by amalgamating the authorities and activities, as well as the resources, of the Alberta Liquor Control Board, with the various entities that made up Alberta's gaming regulatory landscape at the time, namely Alberta Lotteries, the Alberta Gaming Commission, Alberta Lotteries and Gaming and the Gaming Control Branch (Alberta Gaming and Liquor Commission, 2001).

The AGLC pushed forward with the public consultation process, inviting Albertans to participate in the Alberta Lotteries and Gaming Summit of 1998, in Medicine Hat, Alberta. This public input process brought a number of Albertans together to address important issues that so far had been absent from public discussion. The areas of concern were presented in a report, and were reflected in the recommendations that later informed policy.

Some of the recommendations from this report included:

- That the government dedicate more resources to gaming research on social impacts of gambling, including treatment of problem gambling and identifying vulnerable subpopulations.
- That gaming and lottery profits not be applied to the province's General Revenue fund, in order to avoid creating a dependence on gambling as a source of funds.
- By corollary, that all profits be directed to support charitable or non-profit initiatives.
- That the profile and visibility of problem gambling treatment and prevention be raised.
- That provincial gaming regulators maintain transparency and endeavour to keep Albertans informed of all aspects of provincial gaming activity.

(Source: Alberta Lotteries and Gaming, 1998)

Although prohibition of gaming activity was considered, and even promoted by some participants, the majority felt that proceeding within strict limits and guidelines was acceptable. Participants were also apprehensive about new forms of gambling on the horizon, particularly VLTs, and the emergence of Internet gaming. These, and the continuing need to identify high-risk groups, necessitated ongoing discussion (Alberta Lotteries and Gaming, 1998).

The AGLC, formed in March 1995, was empowered by the Gaming and Liquor Act in July 1996, which brought lotteries and other gaming activities under the same authority. The Gaming and Liquor Act is divided into eight parts, four of which have relevance to gaming. The first establishes the authority and structure of the AGLC. It outlines the requirement of a board and a CEO, the

former to develop policies that ensure the Commission effects its purpose, and the latter to ensure that the policies are implemented. Of particular importance in this section is the establishment of the Alberta Lottery Fund from the net proceeds of provincial lotteries, to be administered by the AGLC (Alberta Gaming and Liquor Commission, 2001).

Part 2 of the Gaming and Liquor Act specifies gaming activities, and it is from that section that “charitable gaming” came into existence, as a general term for an approved and licensed provincial lottery scheme. This part also stipulates that all gaming workers must be registered, along with, for the protection of gamblers, all gaming supplies. It is this section that enabled the plebiscites banning VLTs from communities that had expressed opposition to them

- (a) County of Lethbridge No. 26;
- (b) Town of Lacombe;
- (c) Municipal District of Opportunity No. 17;
- (d) Regional Municipality of Wood Buffalo;
- (e) Town of Canmore;
- (f) Town of Coaldale;
- (g) Town of Stony Plain.

Source: Alberta Gaming and Liquor Commission, 2001, p. A2-17

Enforcement was dealt with in Parts 4 and 5 of the Gaming and Liquor Act, empowering inspectors to levy fines and seize equipment or supplies in the event of discovering unlawful activity. Under Section 113 are descriptions of gaming-related offences, of which a few examples convey the tone and intent of the Gaming and Liquor Act:

- §. 36 - conduct or manage a gaming activity without a gaming or facility licence;
- §. 40(1) - make, sell, advertise or distribute gaming supplies without being registered or licensed to do so;
- §. 40(2) - possess gaming supplies not approved by the board;
- §. 41 - inducing a breach of contract;
- §. 45 - make, sell, advertise or distribute lottery tickets unless approved by the Commission;
- §. 46(1) - make, sell, advertise or distribute VLTs not approved by the Commission;



- §. 46(2) - possess a VLT not approved by the Commission.

Source: Alberta Gaming and Liquor Commission, 2001, p. A2-17 - A2-18

It is clear from this list that the Province intends, through the AGLC, to regulate access to gaming and the proprietary relationship it has with VLTs, on behalf of Albertans. These prohibitions are enforced with serious penalties to individuals ranging from maximum fines of \$10,000, six months imprisonment, or both, for general offenses. Those described under §. 45 and §. 46(1) carry heavier sanctions of fines up to \$500,000, imprisonment up to 12 months, or both (Alberta Gaming and Liquor Commission, 2001).

The operational part of the Gaming and Liquor Act is the Gaming and Liquor Regulation itself, proclaimed on June 25, 2002. Of the four sections of this regulation, only the first two apply to gaming: the general provisions and those for gaming and provincial lotteries. The general provisions deal with (among other topics, such as age requirements) applications for gaming licenses, evaluation of background checks, facilities and premises, and offences (Alberta Gaming and Liquor Commission, 2001). The background checks, for instance is “aimed at ensuring that those individuals with criminal backgrounds or who are otherwise determined to be a detriment to the integrity of gaming do not become involved in gaming in the province” (Alberta Gaming and Liquor Commission, 2002, p. 2). The second section, that of gaming, further delineates charitable gaming. It licenses the charitable gaming stream of revenues to charities and non-profit groups wishing to engage in bingos, pull tickets, raffles or casinos. The charitable gaming stream is maintained separate from the Alberta Lottery Fund. While groups with worthwhile needs or initiatives may apply to the ALF for funding, non-profit groups must volunteer resources to participate and share in the revenues from charitable gaming. Section 2 of the Gaming and Liquor Act specifies to whom or what entity a license may be approved, and under what conditions (Alberta Gaming and Liquor Commission, 2001).

By the end of the nineties, Alberta’s First Nation communities had expressed an interest in following the example of the United States indigenous population, and exploiting the opportunities for revenue generation through the establishment of casinos on their reserves. Acceding to their requests, the Alberta Government introduced the First Nations Gaming Policy in January of 2001 (Alberta Gaming and Liquor Commission, 2010). The government would continue to regulate and control gaming, maintaining the charitable gaming model, but would alter the allocation of funds, diverting 40% of the on-reserve revenues to a First Nations Development Fund.

At the time this policy was enacted, AGLC was still reviewing the results of the Gaming License Policy Review. While temporarily imposing a moratorium on approval of any more casinos or extensions to Alberta’s gambling venues, it committed itself to shaping specific First Nations policies according to the guidelines expressed by the stake holders, which included representation from First Nations.

With the policies implemented in this period, the Commission, satisfied that Albertans wanted the choice to gamble, had ensured that gaming activities would continue to be delivered “with integrity and in a socially responsible manner” (Alberta Gaming and Liquor Commission, 2003, p. 2). To further that cause, in 2003, AGLC introduced the GAIN (Gaming Information for Charitable Groups) program that helped charitable groups better understand the gaming industry. This initiative demonstrates the efforts of AGLC to comply

with the concerns and recommendations expressed by Albertans at such gatherings as the 1998 Gaming Summit in Medicine Hat.

The development of responsible and balanced policy was an ongoing commitment for AGLC. In 2004 it finally approved five more casinos, including two on First Nations reserves. It also had to consider the changing dynamics within the gaming industry, and the policy framework was flexible enough to permit alterations. In this case (2004) the first private bingo hall was approved to operate under the charitable gaming model (Alberta Gaming and Liquor Commission, 2005). This was in response to the decline in bingo revenues—a response similar to the implementation of Racing Entertainment Centres (RECs) to assist the horse racing industry earlier.

In 2006, a provincial government reorganization dissolved the Ministry of Gaming, to which the AGLC previously reported, and transferred its function to the Solicitor General and the Minister of Public Security. (Alberta Gaming and Liquor Commission, 2007). The same commitments prevailed, however. In its continuing efforts to promote responsible gaming and disseminate information about gambling, AGLC established Responsible Gambling and Information Centres in 2007 (Alberta Gaming and Liquor Commission, 2010). As part of continuing policy refinement, and in response to concerns in other Canadian provinces, it outlined a new code of conduct to lottery ticket retailers (Alberta Gaming and Liquor Commission, 2009a).

In summary, the regulatory framework of gambling in Alberta is characterized by deliberate policy refinement based on input from Albertans. It is a well-articulated and transparent structure that maintains the welfare of all Albertans as its bottom line. The framework is grounded by necessity in the Criminal Code of Canada, but has been, and continues to be honed to meet the needs of the province as it inspects and regulates gambling facilities in an equitable and socially responsible manner. Alberta's charitable gaming model has developed into an effective channel for returning the proceeds from gambling in Alberta to Albertans, and still remains a work in progress.

## 4.2 Current Availability of Legal Gambling in Alberta

A wide array of legal gambling activities are available to Albertans. These include casino gambling at both private charity casinos and casinos on First Nations reserves with table games and slot machines, horse race gambling and slot machines at “racinos,” bingo halls, video gaming entertainment centres, Video Lottery Terminals (VLTs) in bars and pubs, lottery ticket centres that sell traditional lottery tickets, lotto tickets, and provide access to sports betting through the “Sport Select” program, as well as charity raffles and pull tickets. Table 4.1 summarizes the availability of casino, racino, bingo, and slot machine gambling across the province, based on data from the most recent AGLC report.

In addition, to these types of gambling opportunities, there are currently 5,694 installed and operating VLTs in the province, at 1,030 locations, and 70 Video Gaming Entertainment Rooms. Keno is available in 21 bingo halls, 13 casinos, and 48 Video Gaming Entertainment Rooms across the province. The province contains 2,392 Lottery Ticket Centres where an array of lottery products including high jackpot multi-province 6/49 lotto games, scratch off lottery tickets, and parlay style sports betting. In 2009 there were 271 licenses issued for charity raffles over \$10,000 and 6,791 licenses issued for raffles under \$10,000. These represent single event licenses. Finally, in 2009, there were 457 licenses issued for charity pull ticket events. These licenses are in effect for two years.

Table 4.1: Current Casinos, Racinos, Bingo Halls and Slot Machines in Alberta

Area	Casinos	Racinos	Bingo Halls	Slot Machines
Bonnyville	—	—	1	—
Calgary	7	—	4	4,591
Camrose	1	—	—	200
Cold Lake	1	—	1	150
Edmonton	5	1	7	3,696
Enilda	—	—	1	—
Enoch	1	—	—	600
Fort McMurray	1	—	—	399
Grande Prairie	1	1	1	491
Kananaskis	1	—	—	300
Lac La Biche	—	—	1	—
Leduc	—	—	1	—
Lethbridge	1	1	2	398
Medicine Hat	1	—	1	230
Peace River	—	—	1	—
Red Deer	2	—	2	598
Spruce Grove	—	—	1	—
St. Albert	1	—	1	240
St. Paul	—	—	2	—
Vegreville	—	—	1	—
Wetaskiwin	—	—	1	—
Whitecourt	1	—	—	250
Total	24	3	30	12,143

Source: AGLC Annual Report, 2009

### 4.3 First Nations Casinos in Alberta

In the last few years, a number of First Nations communities in Alberta have opened casinos on reserve land. This represents a significant change in the gambling industry, and the availability of legal gambling opportunities in the province. Table 4.2 shows the name, location, and year that each new First Nations casino opened on tribal reserve land in Alberta. First Nations casino gambling represents an important new development in gambling in Alberta, and this topic deserves special attention. In addition to providing jobs for tribal members and revenues to tribal governments, these First Nations casinos generate significant charitable revenues in the province.

We anticipate that the completed volume produced by the research team at the University of Lethbridge will contain an extensive discussion of First Nations casino gambling in the province. However, we have not been given access to the results and conclusions about First Nations gambling contained in the final report by the University of Lethbridge. Interested readers should consult the University of Lethbridge report when it is made available. In this report, we simply point out the existence of First Nations casinos, and the timing and location of the casino openings in the province.

Table 4.2: First Nation Casino Introduction

Year	Casino	Location
2006	River Cree Resort	Enoch
2007	Casino Dene	Cold Lake
2007	Grey Eagle Casino	Tsuu Tina (near Calgary)
2008	Eagle River Casino	Whitecourt
2008	Stoney Nakota Resort	Kananaskis

Source: AGLC Annual Reports, 2006-2009

## Part II

# Impacts of Gambling by Domain

## Chapter 5

# Economic and Financial Impacts

### 5.1 Gambling GDP

Gross Domestic Product (GDP) is a common measure of economic activity. GDP is the value of goods and services produced by firms over a given period of time. Until 2006, Statistics Canada published annual estimates of total provincial GDP and detailed estimates of the contribution of various industries defined by the North American Industrial Classification System (NAICS). The gambling industry is one of the industries identified in the NAICS. The NAICS defines the gambling industry as “establishments (except casino hotels) primarily engaged in operating gambling facilities, such as casinos, bingo halls, and video gaming terminals, or in the provision of gambling services, such as lotteries and off-track betting.” This is a comprehensive definition of the firms engaged in the production of gambling goods and services.

Table 5.1 shows the annual estimates of the total value of the goods and services produced in the NAICS gambling industry and total provincial GDP in Alberta, expressed in constant or real 2009 dollars over the period 1997-2006, the last year for which such estimates are available. From Table 5.1, the value of goods and services produced by the gambling industry, and provincial GDP, grew steadily in the province over most of this period. The gambling industry was expanding over most of this period. These GDP measures are constructed using standard national income and product accounting methods. After 2004, the value of goods and services produced by the gambling industry declined somewhat, from \$587 million dollars to \$477 million dollars.

The fourth column on Table 5.1 shows the value of goods and services produced by firms in the gambling industry as a percentage of provincial GDP. Clearly, the gambling industry is a relatively small industry in Alberta. The value of goods and services produced by firms in the gambling industry accounts for between 0.10% and 0.15% of the value of goods and services produced in the

Table 5.1: Provincial GDP, Constant 2009 Dollars

Year	Gambling Industry	All Industries	Gambling as % of Total	Growth Rate
1997	\$268,099,886	\$265,998,529,512	0.10%	—
1998	\$296,122,197	\$266,900,221,413	0.11%	10.5%
1999	\$333,925,602	\$10,093,980,952	0.12%	12.8%
2000	\$371,571,429	\$336,053,700,000	0.11%	11.3%
2001	\$367,515,512	\$347,578,580,662	0.11%	-1.1%
2002	\$481,990,500	\$334,664,460,000	0.14%	31.1%
2003	\$479,599,138	\$353,481,090,517	0.14%	-0.5%
2004	\$587,881,020	\$388,084,767,705	0.15%	22.6%
2005	\$415,864,940	\$438,954,098,520	0.09%	-29.3%
2006	\$477,020,036	\$458,419,608,192	0.10%	14.7%

Source: Statistics Canada CanSim II

province annually. By comparison, the gas and oil extraction industry accounted for about 15% of the goods and services produced in the province in 2006. In most years, the value of goods and services produced by the gambling industry grew at a healthy rate, suggesting a robust, expanding industry. The average annual growth rate of gambling GDP over the 1997-2006 period in Alberta was 8%. The only notable exception to this growth occurred in 2005, when the value of goods and services produced by the gambling industry declined by nearly 30% in inflation adjusted terms. This period was not a recession in the province, as provincial GDP grew by a robust 13.1% from 2004 to 2005. Below we explore in detail factors that might explain why the Statistics Canada data indicate a contraction in the value of goods and services produced in Alberta in 2005.

In sum, the size of the gambling industry in Alberta is small relative to the total value of goods and services produced in the province. The value of goods and services produced by firms in the gambling industry grew steadily over the period 1997-2006, with one exception, indicating that the industry expanded over the period. Since little has changed in the industry since 2006, it seems reasonable to assume that this growth has continued. Unfortunately, no detailed data on the value of goods and services produced are available for the gambling industry in Alberta after 2006, and the technical demands of National Product Accounting make it impossible for individual researchers to produce such estimates.

## 5.2 Household Expenditure on Gambling

Households are the primary consumers of the goods and services produced by the gambling industry. Since households are the most important consumers of gambling goods and services, a thorough analysis of this type of expenditure must be performed in any SEIG analysis. Several

alternative sources of data on household expenditure on gambling exist. These sources include standard secondary sources like estimates derived from various Statistics Canada survey programs and estimates of total provincial spending on gambling derived from the population surveys undertaken as part of this research project. We discuss each data source and what they tell us about household expenditure on gambling, as well as the relative merits and limitations of each, in this section.

### **5.2.1 Evidence from the Survey of Household Spending**

Statistics Canada produces annual estimates of average spending on four types of gambling activities (government run lotteries; casinos, slot machines and VLTs; bingo; and non-government raffles) from the annual Survey of Household Spending (SHS). The SHS is based on an annual computer assisted telephone interview survey of about 15,000 Canadians and contains detailed questions about household spending in the previous year. The SHS sample is nationally representative and linked to the Labour Force Survey, providing additional information about participants. The SHS has been conducted annually since 1997, providing consistent, stable, and comparable information about household spending over time in Canada. Note that the SHS is a survey, not a census, and is based on data collected from a random sample of Canadians. Summary statistics derived from this, and other surveys, may reflect sampling issues, especially for smaller geographical areas, as the source data come from surveys.

Table 5.2 summarizes the participation rates for households in Alberta for various types of gambling activities based on data from the SHS. Gambling participation in Alberta is high, with between 50% and 75% of Albertans reporting some sort of spending on gambling in any given year based on SHS data. Casino and VLT spending has remained constant over the period; about 20% of the population spent money at a casino or on a VLT over the period. Lottery participation declined through the period, based on SHS data, although much of the decline can be traced to 2007, which appears to be an outlier as lottery participation declined from 62% of the SHS sample in 2006 to 42% of the SHS sample in 2007. Both raffles and bingo participation declined steadily throughout the sample period, indicating that these activities declined in popularity. Note the steep decline in participation in bingo. Interest in bingo declined rapidly over the past 10 years, and now relatively few people play bingo. Section 10.1 on page 174 discusses the effect of this decline on charitable funds from gambling, which have also declined with participation.

Note that the overall household participation rate in any type of gambling, shown in the last column of Table 5.2, exhibits quite a bit of year-to-year variation in the SHS. This suggests that many households participate in gambling very infrequently, perhaps as infrequently as once every few years.



Table 5.2: Percentage of Albertans Participating by Type of Gambling, 1997-2008

Year	Type of Gambling				
	Lotteries	Casinos & VLTs	Bingo	Raffles	Any Type
1997	63	20	12	44	75
1998	63	21	11	41	74
1999	60	20	9	43	73
2000	56	20	10	40	72
2001	58	22	9	41	72
2002	55	18	9	37	68
2003	56	18	7	36	69
2004	55	16	5	35	67
2005	52	18	6	37	67
2006	62	20	6	39	72
2007	42	20	4	24	49
2008	55	19	3	32	64

*Source: Survey of Household Spending*

Table 5.3 summarizes the average annual household expenditure on gambling, in terms of real or inflation adjusted 2009 dollars, in Alberta for the four different gambling activities identified in the SHS. The values reported in this table represent average annual spending for households who participated in each type of gambling in the past year. Since not all households spend money on gambling in any year, the average spending on gambling across all households in the province would be lower.

Table 5.3 contains a number of interesting features of household gambling expenditure. First, note that average expenditure on each of the types of gambling exhibit quite a bit of variation over time. Like the participation rates on Table 5.2 above, this indicates that individual households change their annual spending on gambling quite a bit year-to-year. This is consistent with a large number of households participating in gambling very infrequently, and with regular gamblers varying their average spending over time. The variation in average annual spending on gambling is much more variable than, for example, the variation in average annual spending on food by Albertans. The coefficient of variation on average household spending on gambling (the standard deviation divided by the mean) is six times the coefficient of variation on household food spending, suggesting that households vary their gambling spending quite a bit, compared to the smoother annual spending on food. This is consistent with, for example, households only buying lotto tickets when the jackpot is large, or only occasionally visiting a casino.

Annual average household spending on casinos and VLTs looks quite different from the other types of gambling identified in the SHS. Annual spending on casinos and VLTs increased in real terms over the period 1997-2008. Average annual spending on lotteries declined somewhat over the

Table 5.3: Real Average Expenditure per Participant by Type of Gambling, 1997-2008

Year	Lotteries	Casinos & VLTs	Bingo	Raffles	All Gambling	% of Total
1997	\$182	\$146	\$121	\$54	\$348	0.50%
1998	\$164	\$199	\$105	\$61	\$395	0.50%
1999	\$172	\$198	\$116	\$59	\$380	0.50%
2000	\$165	\$243	\$81	\$59	\$383	0.50%
2001	\$161	\$225	\$94	\$57	\$377	0.50%
2002	\$158	\$224	\$117	\$66	\$427	0.50%
2003	\$160	\$269	\$107	\$51	\$446	0.60%
2004	\$142	\$116	\$72	\$64	\$302	0.40%
2005	\$130	\$163	\$70	\$62	\$328	0.40%
2006	\$182	\$162	\$29	\$65	\$303	0.30%
2007	\$123	\$255	\$39	\$44	\$351	0.40%
2008	\$151	\$177	\$35	\$52	\$305	0.40%

*Source: Survey of Household Spending*

period, except for a significant increase in 2006. Average annual spending on raffles held constant, and average annual spending on bingo declined significantly. Overall average spending on all types of gambling was \$362 over the period, and average household spending was below this from 2004-2008, suggesting a slight decline. Note that the average annual household spending by Albertans on lotteries in 2007, \$123, is significantly lower than other years. Coupled with the decline in participation in the SHS survey noted above, this suggests either some unusual event related to lotteries in Alberta in 2007 that reduced consumer interest, or some sort of data problem. One possible problem is that Statistics Canada added some new gambling screening questions to the 2007 SHS that led to lower response rates than usual. If this effect was large in Alberta, this could be the reason the 2007 estimates appear different. We will look for evidence of this event later in the report, when we analyze specific types of gambling.

The final column on the table shows annual household spending on gambling as a percentage of total household spending in Alberta in each year. On average, spending on gambling accounts for about one half of one percent of household spending among households who choose to gamble; the average figure for all households in Alberta would be even lower, since not all households gamble. Clearly, annual spending on gambling makes up a relatively small portion of household spending. Household spending on gambling is also small relative to other types of entertainment spending. Total household spending on recreation in Alberta was 7% of overall household spending; annual household spending on alcohol and tobacco was about 2.5% of overall household spending. Annual household spending on gambling in Alberta over the period 1997-2008 was very close to average annual household spending on reading material and other printed matter.

It is important to keep in mind that, in the context of overall household spending patterns reflected in the SHS for households in Alberta, gambling is a relatively minor item in household

budgets. Less than one half of one percent of household spending, on average, goes to gambling; about the same amount is spent on newspapers, magazines, and books. Coupled with the evidence of sporadic, irregular participation shown above, the overall picture that emerges from the SHS is that spending on gambling is not an important component of total household spending.

### 5.3 Consumer Debt Attributable to Gambling

As part of the population surveys carried out during this research, we assess the extent to which gambling led Albertans to borrow money in order to finance their gambling activities.<sup>1</sup> The population surveys contained the following question:

*In the past 12 months, about how much money have you borrowed or obtained from selling possessions in order to gamble?*

This question can be used to assess the effect of gambling on consumer debt in the province. Statistical analysis of survey data containing questions about activities like borrowing and gambling must be undertaken carefully. Decisions to gamble and to borrow money are made simultaneously, and a number of unobservable factors affecting both decisions exist that can confound the statistical relationship between these variables. Because of these factors, simple unconditional statistical analysis, like tests of means, as well as conditional statistical analysis, like standard regression models and factor analysis, may yield misleading results about statistical relationships in survey data. Some disciplines overcome these problems by using random assignment of subjects into treatment and control groups. In this case, we cannot randomly assign individuals into groups of gamblers and non-gamblers to assess the relationship between gambling and other variables of interest.

Several well-established statistical techniques exist to overcome the problem of simultaneous determination of economic variables in survey data and omitted variables problems. One widely used approach is the method of Instrumental Variables (IV). In general, instrumental variables methods use a two-step approach to address statistical problems associated with simultaneous determination and omitted variables problems. In the first step, some variable of interest, in this case participation in gambling, is “identified” through a regression model that is used to statistically predict the outcome of this variable. This predicted value of the first variable of interest (gambling participation in this case) is, by construction, statistically unrelated (orthogonal) to any unobservable factors that affect the second variable of interest, in this case, reported problems with debt. In the second step, the relationship between the predicted value of the first variable

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<sup>1</sup>Professor Robert Williams of the University of Lethbridge designed the surveys and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this valuable work.

of interest (the predicted probability of each individual in the sample) and the second variable of interest (reported problems with debt) is analyzed using a regression model. When using the IV method, the statistical relationship between the predicted values of the first variable of interest and the second variable of interest can be interpreted as causal, and not simply correlative, assuming that gambling participation was properly identified. The IV method has been widely used in economics, health and social sciences, and other areas where secondary data analysis without random assignment is common. Angrist, Imbens and Rubin (1996) describe the IV approach as applied in this setting, and provide a detailed discussion of the technique. Appendix E contains details about the IV models used in this report.

The key issue for implementing IV is to statistically identify the variable of interest. In IV models, identification come from a variable that explains the observed outcomes of the first variable of interest but is statistically unrelated to unobservable factors that affect second variable of interest. This variable is called an “instrument” in the jargon of statistics. In this case, we seek an instrument that explains an individual’s decision to participate in gambling but is unrelated to all observable and unobservable factors that affect an individual’s decision to borrow money. Finding appropriate instruments is not an easy process, and in many cases, a suitable instrument does not exist to identify a variable of interest. In this case, we exploit information about where individuals live, and proximity of their residence to a casino in the province, to identify gambling participation.<sup>2</sup> In particular, we calculated the driving distance between the postal code of the residence of each individual in the population survey and the nearest casino. We assume that this distance statistically explains individuals’ decision to gamble, as it reflects access to casinos, but is unrelated to individuals’ decisions to borrow money. Note that this assumption does not require individuals to patronize the nearest casino, it only captures ease of access. If this assumption holds, then we have statistically identified gambling participation, and can make causal statistical inferences about the effect of gambling on borrowing. Note that this assumption requires that casinos are sited independently of the spatial distribution of consumer borrowing in the province and that individuals do not select their residence based on proximity to a casino. Appendix E contains details about the IV regressions used, including diagnostic assessments of the strength of this instrument.

In the 2008 and 2009 population surveys, slightly less than 1% of those surveyed reported borrowing money to gamble. Among these individuals, the average amount borrowed was \$15,253. We used instrumental variables to assess the relationship between participation in different types of gambling and the likelihood that an individual reported borrowing money to gamble. We estimated separate IV models that treated six different types of gambling as endogenous: lottery, scratch off lottery, bingo, slot machine play, VLT play, and casino gambling. The first stage regression

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<sup>2</sup>Jennifer Arthur of the University of Lethbridge calculated the driving distance between the postal code of the residence of each person in the population survey and the closest casino. We acknowledge and thank her for this hard work.

included the distance to the nearest casino and explanatory variables identified in the literature as important for explaining gambling: age, marital status, gender, level of education, employment status, income, and ethnicity. The second stage regression was a probit model with an indicator variable for borrowing money to pay gambling debts and the other explanatory variables from the first stage. Driving distance to the nearest casino was excluded from the second stage probit model. Table 5.4 summarizes the results of the IV estimation of the relationship between gambling and borrowing to finance gambling losses for the six types of gambling activities. Table 5.4 reports the marginal effect of participating in each type of gambling on the probability that an individual borrowed money in the past year to gamble. Recall that these IV results can be interpreted as causal.

Table 5.4: The Effect of Gambling on the Probability of Borrowing

Type of Gambling	Change in Probability that an Individual Borrowed
Lottery Ticket Purchase	No Change
Instant Win Game Ticket Purchase	No Change
Bingo	No Change
Video Lottery Terminal Play	No Change
Slot Machine Play	+8%
Casino Gambling	No Change

Based on the results reported on Table 5.4, Albertan's participation in most gambling activities does not increase the probability that they borrow money to gamble. In five of the six types of gambling analyzed, participation in gambling did not have any effect on the probability of borrowing. The only exception is individuals who play slot machines. Slot machine players were 8% more likely to report borrowing money to gamble than individuals who did not play slot machines.

## 5.4 Gambling-related Bankruptcy

An analysis of the socioeconomic impact of gambling cannot be considered complete without examining the issue of gambling-related bankruptcies. In this section, we briefly review the studies that examine gambling related bankruptcies and perform an original analysis with data from Alberta. The perception of a causal link between gambling and bankruptcy has intuitive appeal, considering that the negative expected returns to gambling have the potential to lead to financial problems. Bankruptcy represents the terminal point of gambling related financial problems, and arrival at that unfortunate destination is sometimes delayed by criminal activity or the accumulation of additional debt.

In Canada, bankruptcy is a legislated procedure based on the federal Bankruptcy and Insolvency Act and augmented by other federal and provincial legislation. Bankruptcy proceedings can be applied to an insolvent person — a person who is unable to pay his or her liabilities from current earnings and other resources — either by self application or by a petition filed by creditors. A person declared bankrupt surrenders property to a trustee in bankruptcy so that proceeds from the sale of this property can be distributed to creditors. The allocation of funds to creditors follows specific legislated rules. A person who is declared bankrupt can be excused from paying any remaining debt and liabilities.

While some interesting unconditional statistical evidence suggesting a possible link between gambling and bankruptcy exists—for instance the prevalence rate of problem gambling and bankruptcy both fall into a similar range of low single-digit percentages—the factors that cause bankruptcy are complex, and unconditional statistical analysis cannot shed much light on the nature of the relationship between gambling and bankruptcy. In general, five major factors influencing bankruptcy have been identified: income shocks (unemployment, divorce), expected future earnings streams, social stigma or other personal consequences, and legal factors—especially those that apply to wage garnishments (Barron, Staten, & Wilshushen, 2002). Economic factors appear to have a larger impact on bankruptcy than social factors (De la Vina & Bernstein, 2002; Barron et al, 2002). Social factors are related to how households determine current expenditures, and plan future investment activity on changes in information. Economic factors include unexpected loss of employment or sudden illness that lead to loss of wealth, financial shocks that upset those plans and expectations, occasionally triggering ‘insolvency events.’ Gambling losses fall into the general category of income shocks.

The primary concern about gambling and bankruptcy is that “if gambling does have an impact on bankruptcy rates, it will likely do so through problem gamblers” (Boardman & Perry, 2007, p. 790). However, another clear theme in the gambling literature is that a “relatively small proportion of individuals with pathological or extreme gambling tendencies do possess a higher than normal bankruptcy rate” (De la Vina & Bernstein, 2002, p. 508). Because problem gambling rates are low in Alberta, and the proportion of problem gamblers who declare bankruptcy is also small, gambling-related bankruptcies are uncommon events and are not often observed. In addition, the existence of many other non-gambling factors affecting bankruptcy makes an assessment of the causal effect of gambling on bankruptcy even more difficult.

Temporal factors also complicate the analysis of the relationship between gambling and bankruptcy. The most common strategy for approaching bankruptcy is to delay filing as long as possible. Bankruptcy is viewed as an economic adjustment tool (Redish, Darra, & Schabis, 2006) to allow consumers to come to terms with the new reality of their financial circumstances—relieving financial distress and starting fresh. There is an inherent reluctance to file for bankruptcy, associated with the stigma attached to the event. One component of this stigma is social, but another important

component of the stigma stems from the financial repercussions of higher future borrowing costs imposed on individuals who declare bankruptcy. This tendency to delay bankruptcy as long as possible contributes to the difficulty researchers experience when examining the relationship between gambling and bankruptcy.

In addition, some individuals nearing bankruptcy will turn to crime, or perhaps informal credit markets, in order to obtain funds to stave off bankruptcy. Consumers generally adopt a “calculating approach to handling financial problems and opt for bankruptcy when other, informal methods for avoiding repayment are limited by court-ordered garnishment” (Barron et al, 2002, p. 13). Again, this confounds the relationship between bankruptcy and the underlying factors that cause bankruptcy.

Despite these limitations, a large body of literature addresses the relationship between gambling and bankruptcy. The principal working hypothesis in this literature is: “If the prohibition of gambling restrains people from starting on the path to abusive gambling, there should be an increase in bankruptcies following the legalization of gambling” (Daraban & Thies, 2010, p. 3). Several previous studies compared bankruptcy rates before and after the introduction of legalized gambling in various jurisdictions. These studies failed to reach a consensus on the nature of the relationship between gambling and bankruptcy. Early influential studies were public endeavors (U. S. Department of the Treasury, 1999; Gerstein et al 1999) commissioned by policy makers in order to understand the consequences of increased access to legal gambling opportunities. These studies found “no connection between bankruptcy rates and either the extent or introduction of casino gambling” (Boardman & Perry, 2002, p. 791). Subsequent research published by academics in peer-reviewed journals also found similar, but by no means unanimous, results.

As seen in Table 5.5, the most recent US studies, using a variety of analytical approaches and data, generally report a weak relationship between gambling and total bankruptcy rates. An earlier Canadian study showed that 2.44% of bankruptcies among consumers over the age of 55 could be attributed to gambling-related problems (Redish et al, 2006). In general, previous research has not uncovered a strong link between gambling and bankruptcy rates.

There are many problems with both data and measurement in this area of research. As raised in Chapter 1, an inherent fungibility issue related to a person’s expenses is present when classifying a bankruptcy as gambling related rather than due to other factors. More specifically related to Canada, the primary concern is the overlap between consumer and business bankruptcies. The Office of the Superintendent of Bankruptcies (OSB) classifies personal and business bankruptcies separately, but the overwhelming majority of business bankruptcies are single proprietorships that effectively represent personal bankruptcies. As a result, consumer bankruptcy figures are undercounted in official statistics.

The OSB statistics identify only the primary cause of a bankruptcy in Canada. In many cases where gambling might have been a contributing or even primary factor, any references to gambling



Table 5.5: Summary of Previous Research on Gambling and Bankruptcy

Author(s)	Sample	Type	Impact on Bankruptcy
Barron et al (2002)	US Counties 1993-1998	Casino	Increase 8%
Baxandall and Sacerdote (2005)	US Counties 2000	Casino	Increase 3%
De la Vina and Bernstein (2002)	US Counties 1989-1994	Casino, PariMutual	No Impact
Edmiston (2006)	US Counties 2000	Casino and Card Room Parimutual, lottery	Increase Decrease
Indiana Gambling Impact Study Commission (1999)	Interviews with Bankruptcy Filers	NA	None
Nichols et al (2000)	Selected US Counties	Casino	Increase in 5 of 8 counties with new casinos
Gerstein et al (1999)	Survey of Adults 1998	All Types	Higher % of gamblers filed; effect due to PG
Thalheimer and Ali (2004)	Selected Counties 1990-1997	Casino, Parimutual	None

Source: Adapted from Daraban & Thies (2010), p. 3

are omitted due to limitations on the OSB forms, perhaps due to omission of the cause due to the stigma associated with gambling.

Some of the studies shown on Table 5.5 failed to differentiate between personal and business bankruptcies. For instance, De la Vina and Bernstein (2002) used National Opinion Research Center (NORC) survey data and found a significant positive relationship between unemployment and total bankruptcies, but no link between casino openings and bankruptcies. De la Vina and Bersteing (2002) also mentioned that the observed relationship between casino openings and bankruptcy in the U.S. may exist because counties already facing difficult economic times opened casinos to improve local economic conditions. In the same vein, a correlation between divorce and bankruptcy has been reported in the literature, but NORC statistics do not include data on divorce. Controlling for unemployment and pari-mutuel wagering, but not for divorces, under random effects, De la Vina and Bernstein (2002) found no significant effect of casinos on bankruptcies. That being said the paper concluded that "...studies indicate that the relatively small proportion of individuals with



pathological or extreme gambling tendencies do possess a higher than normal bankruptcy rate.” (De la Vina & Bernstein, 2002, p. 508).

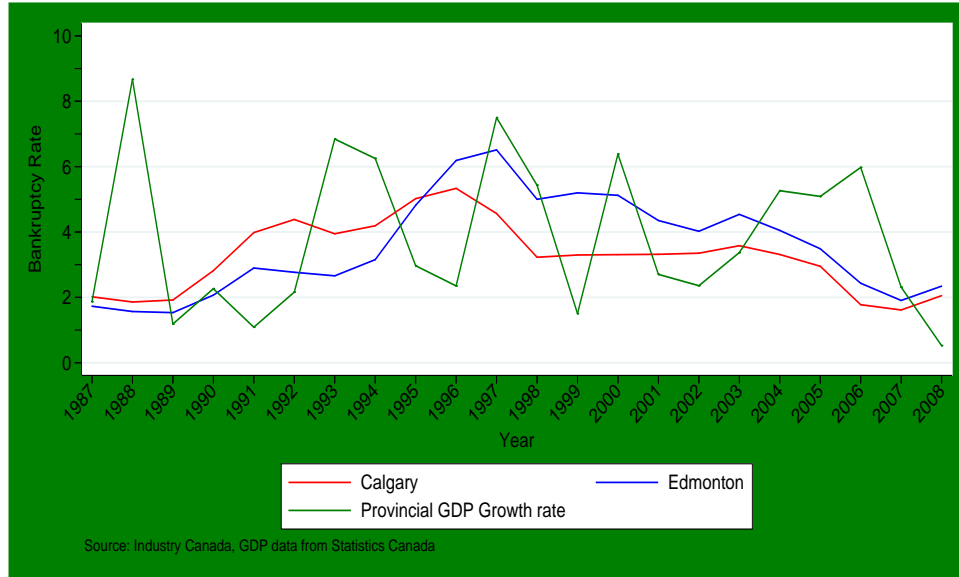
#### 5.4.1 Evidence from Secondary Data

A brief review of estimates from the literature provides context for an analysis of the proportion of consumer bankruptcies resulting from gambling. Redish et al. (2006) concluded that 2.44% of bankruptcies in Canada among seniors (age > 55) are caused by gambling. De la Vina and Bernstein (2002) concluded that economic factors such as unemployment dominate social factors, and render the effect of gambling on bankruptcies small and insignificant. This result is echoed in Nichols, Stitt, and Giacopassi (2000), who found a positive and significant relationship between gambling and bankruptcies in some counties. The results are not universal (Nichols et al, 2000) and vary depending on the features of the communities. In fact, a comprehensive survey of results (Table 5.5) is reported in Daraban and Thies (2010). The consensus of these, and Redish and colleagues’ (2006) results, points to an estimate of about 3% of all consumer bankruptcies attributed to gambling problems.

In order to better understand the relationship between gambling and bankruptcies in Alberta, we examined all available secondary data on bankruptcies in the province. We obtained data on annual bankruptcy rates and insolvency rates, as well as the dollar value of assets and liabilities from bankruptcy proceedings, from Statistics Canada, based on data collected by the Office of the Superintendent of Bankruptcies over the period 1987-2008. These data contain bankruptcy rates for major cities in Alberta per 1000 population over the age of 18. Figure 5.1 shows the annual bankruptcy rate for Calgary and Edmonton over this period, along with the growth rate of provincial GDP expressed in real 2002 dollars as an indicator of overall economic conditions in the province. The first casinos in these two cities opened in 1980 and 1981 according to Appendix A, before the OSB bankruptcy data are available. The figure contains no significant spikes or increases in the years that casinos opened in these cities (1987, 1989, 1996, 1997, 2005, and 2007 in Calgary and 1991, 1996, 2000 and 2006 in Edmonton). Sustained economic growth over the first decade of the 21st century appears to be associated with a decline in bankruptcies in the province.

The social cost of bankruptcies is related to the difference between the liability assigned to the debtor and the assets that can be claimed by the creditors. The real total value of assets, liabilities, and the difference (“deficiencies”) in annual bankruptcies in Alberta are shown on Figure ??, expressed in billions of real 2008 dollars. Despite the decrease in the rate of consumer bankruptcies in Alberta, the real values involved increased over time, except for a decline in the mid-2000s.

Figure 5.1: Consumer Bankruptcy Rates in Calgary and Edmonton



#### 5.4.2 Evidence from Secondary Panel Data

Historical bankruptcy data are available from the Office of the Superintendent of Bankruptcy (OSB) Canada for major cities and economic regions for every Canadian province since 1987. These data take the form of average annual bankruptcy rates per 1,000 population—a measure of the number of people who went through a formal bankruptcy procedure in the province in that year—and the average rate of insolvency per 1,000 population—a measure of the number of people who are either unable to pay their debts or have liabilities that exceed their total assets in that year—for relatively disaggregated geographic areas. The economic regions in Alberta are discussed in Chapter 19 beginning on page 257. Note that not all insolvent persons go through bankruptcy, so insolvency rates are higher than bankruptcy rates per 1,000 population. The OSB collects and distributes data for the entire province and for economic regions in each province. The economic regions in Alberta are Lethbridge-Medicine Hat, Camrose-Drumheller, Calgary, Banff-Jasper-Rocky Mountain House, Red Deer, Edmonton, Athabasca-Grand Prairie, and Wood Buffalo-Cold Lake. Unfortunately, data on bankruptcy rates and insolvency rates are not available for smaller geographic areas in Alberta.

We perform a statistical analysis of the relationship between the opening of casinos in the province and historical bankruptcy and insolvency rates in each economic region over the period 1987-2009. The details of this statistical analysis can be found in Appendix D. In general, this approach uses multiple regression techniques to estimate the conditional correlation between the number of casinos in each economic region and the annual average bankruptcy rate and insolvency rate in the economic region. This multiple regression approach explains observed variation in insolvency and bankruptcy rates across economic regions and over time with observed variation

in other factors, including economic factors like the unemployment rate, demographic factors like the population, and variation in the number of casinos across economic regions and over time. The multiple regression model controls for unobservable heterogeneity in the economic regions and years in the sample, as well as the effect of confounding factors like the unemployment rate in the economic region and the population of the region. However, the regression results are measures of statistical association, and not causal estimates, so they must be interpreted with care.

Each economic region has at least one casino open at some point in the sample period, and with the exception of Calgary and Edmonton, where casinos opened in the early 1980s before the sample period, the casinos opened within the sample period, implying that the statistical analysis includes both periods with casinos and without casinos for six of the eight economic regions in Alberta, providing a basic “before and after” analysis. Note that no distinction is made between First Nations casinos and charity casinos in this analysis. Both are assumed to have the same impact on financial distress.

Table 5.6: Bankruptcy and Insolvency Rates per 1,000 Population

Economic Region	Bankruptcy Rate	Insolvency Rate
Athabasca/Grande Prairie	2.61	2.90
Banff/Jasper	2.52	2.71
Calgary	3.23	3.51
Camrose/Drumheller	1.96	2.11
Edmonton	3.58	3.93
Lethbridge/Medicine Hat	3.27	3.43
Red Deer	3.04	3.28
Wood Buffalo/Cold Lake	2.40	2.67

Table 5.6 summarizes the average bankruptcy rates and insolvency rates per 1,000 population in the economic regions in Alberta over the sample period. The average insolvency rate in Canada was 3.33 per 1,000 population over this period; the average bankruptcy rate in Canada was 2.92 per 1,000. While the average rates of insolvency and bankruptcy are informative, the statistical analysis using multiple regression techniques provides more information about the relationship between casino gambling and financial distress in the province.

The multiple regression model generates parameter estimates that describe the observed relationship between variation in insolvency and bankruptcy rates and a number of demographic and economic factors like the population of the economic area and the unemployment rate in each area. Both the annual insolvency rate and the annual bankruptcy rate increase with the unemployment rate in the economic region over the sample period, consistent with previous results in the literature. When the unemployment rate rises, more people in the economic region lose their jobs and their ability to pay creditors declines; this leads to an increase in insolvency and bankruptcy rates.

The results also indicate that insolvency and bankruptcy rates fall with population in the economic region. Insolvency and bankruptcy are more common in less populated regions of Alberta.

The parameters of interest here capture the relationship between insolvency and bankruptcy rates and the number of casinos in each economic region. The time line in Appendix A shows the year in which each casino opened in Alberta. These openings and closings provide variation in the number of casinos present in each economic region and variation within each economic region over time. The multiple regression model exploits this variation to quantify the relationship between insolvency and bankruptcy rates and casino gambling, conditional on other observable and unobservable factors that affect insolvency and bankruptcy. Two multiple regression models were estimated: a model explaining observed variation in insolvency rates and a model explaining observed variation in bankruptcy rates. Each model had 184 observations (23 years of data for 8 economic regions). The estimated parameter on the variable capturing the number of casinos in each economic region was positive in both models, suggesting that insolvency and bankruptcy rates were higher in economic regions with more casinos, other things equal. The estimated parameter on the variable capturing the number of casinos in each economic region in the insolvency rate model was marginally significant in statistical terms based on conventional significance levels, suggesting that the statistical evidence that variation in the number of casinos in the economic area explains observed variation in insolvency rates is weak. The estimated parameter on the variable capturing the number of casinos in each economic region in the bankruptcy rate model was statistically significant.

The parameter estimates from multiple regression models are random variables, and should be interpreted as such. While it is possible to place a specific value on regression parameter estimates, it is more informative to express them in terms of confidence intervals. The standard confidence interval for regression analysis is 95%. The interpretation of a 95% confidence interval is that, in statistical terms, based on the available data and model, the researcher is 95% confident that the true parameter—in this case the actual relationship between casinos and insolvency and bankruptcy rates—lies in the interval. There is also a small chance, in this case 5%, that the true parameter is bigger or smaller, but random variation prevented the regression model from accurately estimating the true parameter. Confidence intervals are defined by an upper and lower bound, which are simply calculated from the parameter estimate and the standard error of the estimate.

Table 5.7 summarizes the relationship between casinos and financial distress in Alberta, based on the multiple regression analysis (details can be found in the Appendix D). The parameter estimates from the regression model have been converted into elasticities—a common method of reporting estimates that expresses them in terms of the percent change in the dependent variable that occurs when the explanatory variable changes by one unit—and estimates of the actual number of cases in the province to make the interpretation of the results easier.

Table 5.7: The Effect of an Additional Casino on Insolvency and Bankruptcy

Evaluation Point	Elasticity		# of Additional Cases	
	Insolvency	Bankruptcy	Insolvency	Bankruptcy
Lower Bound, 95% CI	-0.001	0.001	-2	1
Parameter Estimate	0.054	0.066	61	69
Upper Bound, 95% CI	0.110	0.132	123	137

From Table 5.7, based on the multiple regression model results, there is a 95% chance that each additional casino opened in Alberta over the period 1987 to 2009 was associated with between two fewer case of insolvency in the province and 123 additional cases of insolvency in the province per year, other factors held equal. On average, each additional casino opened was associated with 61 additional insolvency cases. The confidence interval reflects the weak nature of the results for the insolvency regression model, as the 95% confidence interval includes zero, implying that no association between casino openings and insolvency cannot be ruled out. There is a 95% chance that each additional casino opened in Alberta over the period 1987 to 2009 was associated with between one additional bankruptcy cases in the province and 137 additional bankruptcy cases in the province per year, other factors held equal. On average, each additional casino opened was associated with 69 additional bankruptcy cases.

On average, there were 1,120 insolvency cases, and 1,040 bankruptcy cases in the province in each year over the period 1987 to 2009. Based on those averages, and the marginal impact of casinos on Table 5.7, a new casino opening was associated with an increase of 5.4% in the insolvency rate and 6.6% in the bankruptcy rate in each year. Based on the confidence interval estimates, we are 95% certain that each additional casino opened was associated with between no increase in the insolvency rate and a 11.0% increase in the insolvency rate; we are 95% confident that each additional casino opened was associated with between no increase in the bankruptcy rate and a 11.8% increase in the bankruptcy rate. These results are consistent with those in the research literature on bankruptcy and casino opening reported above. Note the relative imprecision of the estimates. In statistical terms, there is no reason to think that a very small change in the rate of financial distress, a 5% to 6% increase, or a 10% increase represents the most likely association between casino openings and financial distress in the province over this period. This imprecision results from a lack of data, and cannot be improved much given existing data.

In summary, the results of the multiple regression analysis of insolvency and bankruptcy rates and casinos suggests a small, but statistically significant increase in bankruptcies and insolvency when a new casino was opened in the province over the past 23 years. If the same relationship holds in the future, additional casino openings would be expected to have the same effect: about 60 more insolvencies and 70 more bankruptcies in the province. In the previous analysis, all casinos

are treated as if they are the same size. However, casinos are different sizes. Currently, we lack the data in order to exploit the size difference of casinos. Future research should examine this impact. In addition, this statistical analysis may suffer from reverse causality problems. If individuals headed toward bankruptcy turn to gambling in a last-ditch effort to reverse their financial fortunes, a statistical analysis of secondary data will reflect these decisions as a positive association between gambling opportunities and bankruptcy. We lack sufficient data to detect such outcomes, but the results presented here may reflect them, if they occur.

Future casino openings may differ from previous casino openings in important ways, including location, size, and types of games offered. Also, bear in mind that these are personal bankruptcies, and there are also business bankruptcies involving small businesses that are effectively personal bankruptcies that are not included in this analysis. Note that these regression estimates are not causal, they are measures of statistical association. The statistical relationship reported here could be due to siting and opening casinos in areas with relatively poor economic conditions, in which case the statistical relationship would be associative, but not causal.

### 5.4.3 Evidence from Population Surveys

As part of the population surveys carried out during this research, we assessed the extent to which gambling led Albertans into bankruptcy of financial problems.<sup>3</sup> The population surveys contained the following questions:

*In the past 12 months, has your gambling caused any financial problems for you or your household?*

*In the past 12 months, have you filed for bankruptcy because of gambling?*

These questions can be used to analyze the relationship between gambling and bankruptcy and financial stress among residents of the province. Statistical analysis of survey data containing questions about activities like bankruptcy and gambling must be undertaken carefully. Decisions to enter bankruptcy and gamble are made simultaneously, and a number of unobservable factors affecting both decisions exist that can confound the statistical relationship between these variables. Because of these factors, simple unconditional statistical analysis, like tests of means, as well as conditional statistical analysis, like standard regression models and factor analysis, may yield misleading results about relationships in survey data. Some disciplines overcome these problems by using random assignment of subjects into treatment and control groups. In this case, we cannot randomly assign individuals into groups of gamblers and non-gamblers to assess the relationship

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<sup>3</sup>Professor Robert Williams of the University of Lethbridge designed the survey and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.

between gambling and other variables of interest. In addition, there is a concern that people attribute financial problems directly to gambling and not to other potentially serious financial issues. Asking people about with financial problems about gambling invites them to focus on gambling and not other factors. Despite these limitations we believe these questions asked in the survey are the best attempt to examine gambling related bankruptcies given the limitations of the secondary data.

Several well-established statistical techniques exist to overcome the problem of simultaneous determination of economic variables in survey data and omitted variables problems. One widely used approach is the method of Instrumental Variables (IV). In general, instrumental variables methods use a two-step approach to address statistical problems associated with simultaneous determination and omitted variables problems. In the first step, a variable of interest is “identified” through a regression model that is used to statistically predict the outcome of the variable of interest. This predicted value of the first variable of interest is, by construction, unrelated to any unobservable factors that can affect the second variable of interest. In the second step, the relationship between the predicted value of the first variable of interest and the second variable of interest is analyzed using a regression model. When using the IV method, the statistical relationship between the predicted values of the first variable of interest and the second variable of interest can be interpreted as causal, and not simply correlative, assuming that the first variable of interest was properly identified. The IV method has been widely used in economics, health and social sciences, and other areas where secondary data analysis without random assignment is common. Angrist, Imbens and Rubin (1996) describe the IV approach as applied in this setting, and provide a detailed discussion of the technique. Appendix E contains details about the IV models used in this report.

The key issue for implementing IV is to statistically identify the variable of interest. In IV models, identification come from a variable that explains the observed outcomes of the first variable of interest but is statistically unrelated to unobservable factors that affect second variable of interest. This variable is called an “instrument” in the jargon of statistics. In this case, we seek an instrument that explains an individual’s decision to participate in gambling but is unrelated to all observable and unobservable factors that affect an individual’s financial situation. Finding appropriate instruments is not an easy process, and in many cases, a suitable instrument does not exist to identify a variable of interest. In this case, we exploit information about where individuals live, and proximity of their residence to a casino in the province, to identify gambling participation.<sup>4</sup> In particular, we calculated the driving distance between the postal code of the residence of each individual in the population survey and the nearest casino. We assume that this distance statistically explains individuals’ decision to gamble but is unrelated to individuals’ financial situation. If this assumption holds, then we have statistically identified gambling participation, and can make causal

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<sup>4</sup>Jennifer Arthur of the University of Lethbridge calculated the driving distance between the postal code of the residence of each person in the population survey and the closest casino. We acknowledge and thank her for this hard work.



statistical inferences about the effect of gambling on borrowing. Note that this assumption requires that casinos are sited independently of the spatial distribution of consumer finances in the province and that individuals do not select their residence based on proximity to a casino. Appendix E contains details about the IV regressions used, including diagnostic assessments of the strength of this instrument.

In the 2008 and 2009 population surveys, only a 14 individuals reported declaring bankruptcy because of gambling. About 2% of the sample reported financial problems associated with gambling. We used instrumental variables regression models to assess the relationship between participation in different types of gambling and the likelihood that an individual declared bankruptcy or reported experiencing financial problems. We estimated separate IV models for six different types of gambling: lottery, scratch off lottery, bingo, slot machine play, VLT play, and casino gambling. The first stage regression included the distance to the nearest casino and explanatory variables identified in the literature as important for explaining gambling: age, marital status, gender, level of education, employment status, income, and ethnicity. The second stage regression was a probit model with an indicator variable for bankruptcy or financial stress and the other explanatory variables from the first stage. Driving distance to the nearest casino was excluded from the second stage probit model. Table 5.8 summarizes the results of the IV estimation of the relationship between gambling and financial problems for the six types of gambling activities. Table 5.8 reports the marginal effect of participating in each type of gambling on the probability that an individual declared bankruptcy or reported financial stress because of gambling. Recall that these IV results can be interpreted as causal.<sup>5</sup>

Table 5.8: The Effect of Gambling on Bankruptcy and Financial Distress

Type of Gambling	Change in Probability of Bankruptcy	Change in Probability of Financial Distress
Lottery Ticket Purchase	No Change	No Change
Instant Win Ticket Purchase	No Change	No Change
Bingo	No Change	No Change
Video Lottery Terminal Play	No Change	No Change
Slot Machine Play	No Change	+3%
Casino Gambling	No Change	No Change

The results reported on Table 5.8 suggest that gambling has little effect on bankruptcy rates and financial stress in the province, based on the population survey data. With the exception of slot machine players, no type of gambling was associated with declaring bankruptcy or reporting financial stress in the surveys. Slot machine players were 3% more likely to experience financial stress than people who did not play slot machines. Note that this result is consistent with the effect of gambling on borrowing from the population surveys reported on Table 5.4 above.

<sup>5</sup>The full results are in Tables E.4 and E.5 of Appendix E.



#### 5.4.4 Summary

In summary, the effect of gambling on bankruptcies is difficult to isolate and quantify. Part of this is because of the way data is collected. Bankruptcies are not asked explicitly for all contributing factors—only the primary factor. Because of social stigmas attached to gambling, an individual may be reluctant to appear irresponsible, and might hesitate to declare gambling as a primary cause. Left to impute this data, researchers have been hard pressed to find a measurable and significant correlation between gambling and bankruptcy. The literature points to an average of about 3%, which yields a figure of approximately \$8 million in 2008, which represents the deficiency in bankruptcy claims between the liabilities and assets of the bankrupt.

### 5.5 The Effect of Casinos on Property Values

We do not analyze the effects of casinos and bingo halls on local property values, due to a lack of appropriate data. Analyzing the effect of gambling venues on property values requires access to data on transaction prices, or perhaps self-reported property values, for residential property, the characteristics of the property (size, bedrooms, baths, etc), and a measure of proximity to gambling venues before and after the venues opened. After a long search, we were unable to locate a data source with these characteristics in Alberta. This would be a good topic for future research, as casinos and bingo halls may generate external costs and benefits that could be capitalized in the price of fixed assets like property.

Some evidence exists suggesting that the presence of a casino increased residential property values. Wenz (2007) used data from the 1990 and 2000 US Census of Population and Housing to assess the effect of proximity to a casino on housing values. Wenz (2007) used a hedonic housing price model that generates estimates of the implicit price of various characteristics like number of bedrooms, lot size and structure age. This methodology can also be used to estimate the effect of proximity to a casino on housing prices. Wenz (2007) concludes that proximity to a casino increases the value of owner-occupied residential housing by about 1.8%, or \$2,000-\$3,000, and that the effect increases in areas with lower population density. The positive effect of proximity to a casino reflects that the intangible local benefits generated by casinos, in the form of amenity values and enhanced community services financed by casino tax revenues, outweighs the negative external costs generated by casinos, and these positive net benefits are capitalized into owner-occupied housing prices. This result has important implications for Alberta, where a number of casinos exist and the population density is relatively low. If this result can be applied to Alberta, then casinos here may also generate significant positive external benefits for Albertans.

The study has several limitations. It uses self-reported estimates of the market value of a house, not transactions values. It does not statistically control for spatial autocorrelation in the data.

And it is based on data from the US, not Canada, where the housing market may have different characteristics. Still, the results are suggestive of important intangible benefits from casinos in the province.

Casinos could also have an effect on commercial property values. Similar to residential property values, we were unable to locate a data source to examine the effect that the presence of a casino has on commercial property values. Recent research by Wiley and Walker (2011) examines the effect of a casino's presence on retail property values in the city of Detroit, Michigan, in the United States. The results of their study indicate that the presence of a casino increases retail property values. The increase of retail property values are strongest within a five-mile radius of a casino.

Another important issue related to the effect of casinos on property values is the opportunity cost of land. Opportunity cost is defined simply as the value of the next best alternative. It is reasonable to assume that government or private business has a choice in how to develop the land. Once a casino is built, the land around the casino will more than likely be developed with commercial property such as restaurants, hotels, and bars. The opportunity cost of the surrounding land will more than likely be higher compared to before the casino was built. This would also be a good topic for future research.

## **5.6 The Size of the Gambling Industry in Alberta**

### **5.6.1 Evidence from Canadian Business Patterns**

The Canadian Business Patterns (CBP) is an annual census of businesses in Canada produced by Statistics Canada. CBP data are available since 2000 and contain detailed information on the number of businesses across relatively small geographic areas, including provinces, census divisions, census subdivisions, census agglomerations, and metropolitan areas. The economic regions in Alberta are discussed in Chapter 19 on page 258. In this chapter, we analyze establishments in the gambling industry at the census division level in Alberta, the smallest geographic area at which CBP data are available in the province. CBP reports the number of businesses located in geographic areas based on the North American Industrial Classification System (NAICS). The NAICS is a taxonomy of businesses in Canada, the United States and Mexico. The NAICS classifies businesses into broad 2-digit codes, called industries (manufacturing, retail trade) as well as more detailed classifications within each industry. For example, the two digit NAICS code industry "Arts, Entertainment, and Recreation" (NAICS code 71) can be subdivided into numerous three digit industry groups like "Amusement, Gambling, and Recreation Industries" (NAICS code 713). In general, the longer the NAICS code, the more detailed and specific the classification of businesses in that code group. In general, the first two digits of a NAICS code identifies the largest business sector, the third digit

identifies the subsector, the fourth digit identifies the industry group, and the fifth digit identifies particular industries within that industry group. When a NAICS code contains a sixth digit, that final digit identifies a national industry, which can differ in Mexico, Canada and the United States. The basic unit of observation in the NAICS is an establishment, which is a physical location where business is conducted, or services or industrial operations carried out. Examples of establishments include individual stores, farms, or mines.

The CBP data contains establishment counts at the 2, 3, 4 and 6-digit NAICS code level. It contains counts of total establishments in each NAICS industry group, as well as establishment counts for specific ranges for number of employees at the establishment: 1 to 4 employees, 5 to 9 employees, 10 to 19 employees, 20 to 49 employees, 50 to 99 employees, 100 to 199 employees, 200 to 499 employees, and over 500 employees. The CBP also contains an indeterminate category as part of the employee range that captures businesses like sole proprietorships and partnerships that do not employ other people. We examine establishments at the 6-digit NAICS code level, which NAICS defines as “national industries.” We use the 6-digit code level because at this level of detail, the NAICS classification system identifies specific gambling industries. In addition, casino hotels fall under a different 4-digit NAICS code from the rest of the gambling industry, data at the 6-digit level allows us to identify casino hotels as part of the gambling industry.

We have identified the NAICS industries shown below as directly related to gambling. Below we reproduce the NAICS definition for each industry, including the industry title, the 6-digit classification code, and the official NAICS description of the industry from the Statistics Canada website. These descriptions come directly from the NAICS definitions on Statistics Canada website.<sup>6</sup>

**Casino Hotels** (NAICS Code 721120). “This industry comprises establishments primarily engaged in providing short-term lodging in hotel facilities with a casino on the premises. The casino on premises includes table wagering games and may include other gambling activities, such as slot machines and sports betting. These establishments generally offer a range of services and amenities, such as food and beverage services, entertainment, valet parking, swimming pools, and conference and convention facilities.”

**Casinos** (NAICS Code 713210): “This industry comprises establishments primarily engaged in operating gambling facilities that offer table wagering games along with other gambling activities, such as slot machines and sports betting. These establishments often provide food and beverage services. Included in this industry are floating casinos (i.e., gambling cruises, riverboat casinos).”

**Lotteries** (NAICS Code 713291): “This industry comprises establishments primarily engaged in organizing lotteries and selling lottery tickets through existing retail distribution channels or directly to consumers. Establishments owned or operated by governments are included.”

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<sup>6</sup>URL: <http://stds.statcan.gc.ca/naics-scian/2002/>.

**All Other Gambling Industries** (NAICS Code 713299): “This industry comprises establishments primarily engaged in operating gambling facilities (except casinos or casino hotels) or providing gambling services.” This classification covers all other industries that are not classified in a particular category but whose primary business function is gambling related. Examples of business included in this category are bingo halls, gambling control boards, lottery corporations, and off-track betting parlors.

Using CBP establishment count data provides a relatively comprehensive picture of the number of businesses in the gambling industry in the province. This comprehensive approach provides a complete description of the entire industry and its role in Alberta’s economy.

### 5.6.2 Establishment Counts by NAICS Code in Alberta

The CBP data allow us to document the number of establishments in the gaming industry in the province, and to get a sense of the size of these establishments, in terms of number of employees. Size and number of establishments are important indicators of economic activity, although they cannot provide information about the dollar value of employment in the gambling industry in the province. In the next section, we use another data source to develop evidence about wages and earnings in the gambling industry.

Table 5.9 shows the provincial total establishment counts for casino hotels from 2000-2008 by employee range. In Alberta, the number of casino hotels increased from one with 20-49 employees in 2000 to a maximum of four, in 2004 and 2007, including two with more than 500 employees. The table also shows that the size of casino hotels in the province grew over the period, providing more jobs in the province. In 2002 the province had one casino hotel with 20-49 employees and one with 100-199 employees. In 2008 all three casino hotels in the province had more than 100 employees.

Table 5.10 contains the provincial establishment counts for the NAICS casino industry. Since 2000, the number of casinos in the province has almost tripled, going from 12 in 2000 to 31 in 2008. In addition, an increase in the number of establishments with 500 or more employees occurred throughout the period. Overall, a majority of the casinos in the province employ more than 50 people, and many employ more than 500. This NAICS industry also contains a large number of businesses in the indeterminate employment classification, meaning they have only one or two employees. While these businesses may be small in terms of employment, they may still have considerable economic impact in the local economy. Note this may understate the number of hotels associated with the gambling industry in Alberta if hotels open near casinos but not near enough to be counted in the Casino Hotel national industry.

Table 5.11 contains establishment counts by year and employment category for the NAICS lottery industry. This NAICS industry clearly includes a large number of small businesses, including

Table 5.9: Provincial Establishment Counts, Casino Hotel (NAICS Code: 721120) Industry

Year	Number of Establishments								
	Total	1-4	5-9	10-19	20-49	50-99	100-199	200-499	500+
2000	1	0	0	0	1	0	0	0	0
2001	1	0	0	0	1	0	0	0	0
2002	2	0	0	0	1	0	1	0	0
2003	2	0	0	0	1	0	1	0	0
2004	4	0	0	0	2	1	1	0	0
2005	2	0	0	0	1	0	1	0	0
2006	3	0	0	0	2	0	1	0	0
2007	4	0	0	0	1	0	1	0	2
2008	3	0	0	0	0	0	1	1	1

Table 5.10: Provincial Establishment Counts, Casino (NAICS Code: 713210) Industry

Year	Number of Establishments								
	Total	1-4	5-9	10-19	20-49	50-99	100-199	200-499	500+
2000	12	1	0	0	1	2	1	2	1
2001	14	1	0	0	0	3	1	3	0
2002	15	0	0	0	1	4	1	3	0
2003	19	0	0	0	0	4	3	4	1
2004	23	0	0	0	0	5	4	4	1
2005	24	0	2	0	0	2	4	4	2
2006	24	0	2	0	0	2	4	2	4
2007	28	0	2	0	0	3	4	2	4
2008	31	0	2	0	0	3	5	3	3

many partnerships and businesses with 1 to 4 employees. Note the “Total” column also contains establishments in a “indeterminate” category that contains sole proprietorships and partnerships. Very few of the businesses in this category employ more than 20 people. These are small retail establishments that primarily sell lottery tickets. Note the decrease in the number of lottery establishments over the period. In 2008 there were 81 lottery establishments in the province, down from 117 in 2000 and the maximum of 124 in 2001. In addition to the decrease in the number of establishments, the size of these establishments has decreased over time, as no firm employs more than 99 employees.

Table 5.12 contains establishment counts for the NAICS industry containing all other businesses in the gambling industry. This is a “catch-all” category, so the businesses counted in this NAICS industry are heterogeneous. Similar to Table 5.11, Table 5.12 shows a decrease in the number of establishments in the NAICS industry. Starting in 2000, there were 92 establishments in the

Table 5.11: Provincial Establishment Counts, Lottery (NAICS Code: 713291) Industry

Year	Total	Number of Establishments							
		1-4	5-9	10-19	20-49	50-99	100-199	200-499	500+
2000	117	60	13	5	1	0	0	1	0
2001	124	62	14	5	1	0	0	1	0
2002	115	49	16	3	2	1	0	1	0
2003	111	52	14	6	3	1	0	0	0
2004	108	55	8	5	3	1	0	0	0
2005	99	54	11	2	3	1	0	0	0
2006	95	54	6	3	3	1	0	0	0
2007	87	53	8	1	3	1	0	0	0
2008	81	41	15	1	2	1	0	0	0

providence that were classified as other gambling industries. In 2008, the number has decreased to 60 establishments. The decline in establishments was primarily in the smaller employment categories. Note the “Total” column also contains establishments in a “indeterminate” category that contains sole proprietorships and partnerships; the Other Gambling national industry contains a substantial number of these establishments. Most of these establishments in this NAICS industry employ less than 50 people. Toward the end of the period, the average size of establishments increased, even though the total number of establishments was decreasing. This suggests that the overall employment impact of this NAICS industry did not decline over the period.

Table 5.12: Provincial Establishment Counts, Other Gambling Industries (NAICS Code: 713299)

Year	Total	Number of Establishments							
		1-4	5-9	10-19	20-49	50-99	100-199	200-499	500+
2000	92	13	13	26	18	2	1	0	0
2001	93	11	13	28	15	2	1	0	0
2002	85	12	11	23	16	2	1	0	0
2003	82	11	12	20	18	1	2	0	0
2004	80	10	13	17	19	1	1	0	1
2005	74	10	11	17	19	1	1	0	0
2006	73	11	10	18	18	0	0	1	0
2007	67	12	9	13	15	1	0	1	0
2008	60	7	2	20	17	0	0	1	0

In addition to establishment counts at the provincial level, the CBP data also permit an analysis of regional patterns in the location of businesses in the gambling industry, based on census divisions. It is important to understand the spatial distribution of these businesses across the province because this shows where gambling activity takes place. Table 5.13 contains establishment counts for each

of the four NAICS industries by census division in the province. Keep in mind that the table lists the primary city or town in each census division but the data include much larger areas than just these cities. This distinction is especially important in rural census divisions. From Table 5.13, the largest concentration of businesses in the gambling industry lies in the two largest cities in Alberta, Calgary, and Edmonton. This is not unexpected, since most of the economic activity in the province takes place in these cities, and most of the consumers in the province live in these cities. Also note the clear decline in the number of gambling establishments in many of the rural census divisions. For example, the census division containing Red Deer had 13 gambling related establishments in 2000 but only 1 establishment in the gambling industry in 2008. A similar pattern exists in Lethbridge, Camrose-Lloydminster, Slave Lake and Grand Prairie.

Table 5.13: Total Establishment Counts in Gambling Industry by Year and Census Division

Census Division	2000	2001	2002	2003	2004	2005	2006	2007	2008
Medicine Hat	4	4	5	5	5	6	6	7	7
Lethbridge	8	9	10	9	9	10	10	7	7
Fort MacLeod	1	1	1	1	1	1	1	1	1
Hanna	0	0	0	0	0	0	0	0	1
Drumheller	3	2	2	1	2	1	1	1	1
Calgary	70	76	71	69	70	63	61	60	55
Stettler	0	0	0	0	0	0	0	0	1
Red Deer	13	12	10	9	11	9	10	10	1
Rocky Mountain House	0	0	0	0	0	0	0	0	1
Camrose-Lloydminster	6	7	5	5	3	3	3	4	3
Edmonton	90	94	88	88	85	78	82	76	78
St. Paul	4	4	5	6	6	6	4	4	5
Athabasca	0	0	0	0	0	2	0	1	0
Edson	2	2	2	2	2	2	1	1	1
Banff	0	0	0	0	0	0	0	0	0
Fort McMurray	7	7	5	5	5	5	5	5	6
Slave Lake	3	3	3	3	3	2	2	2	1
Grande Cache	0	0	0	0	0	0	0	0	0
Grande Prairie	11	11	10	11	13	11	9	7	6

The reasons for the decline in the number of establishments in the gambling industry in some census divisions are unclear. It could represent a contraction of the industry, perhaps because of declines in demand for gambling goods and services in these areas. Or it could represent a concentration of suppliers of gambling goods and services over time, as individual firms in these industries grow. This could be good for consumers of gambling goods and services if there are economies of scale in the production of gambling goods and services, as a smaller number of larger businesses can provide products at a lower cost in the presence of economies of scale. Unfortunately, we lack data to fully explore this possibility.

Still, the analysis of establishment counts at the sub-provincial level shows that the gambling industry is not static. Opportunities to gamble in the province changed over time, and the nature of the change was different in different parts of the province. These changes could reflect demographic shifts, changes in preferences for gambling, or other factors. But even a relatively regulated industry like gambling changes over time and geography.

## 5.7 Government Gambling Revenues and Costs

In Alberta, like the rest of Canada, legal gambling is a government sponsored and regulated industry. Section 4.1 on page 4.1 in Chapter 3 discusses the regulatory structure of the gambling industry. The Alberta Gaming and Liquor Commission (AGLC) regulates all elements of the gaming industry. As a government sanctioned and regulated industry, the gambling industry generates revenues for the government and it also generates costs. In this section, we examine the direct governmental benefits and costs of gaming in Alberta.

### 5.7.1 Government Gambling Revenues

The provincial government derives revenues from gambling. In this section, we examine the role that gambling plays in provincial government budgets in Alberta. There are many data sources that could be used to estimate the role played by gambling revenues in government budgets. In order to provide context for the role of gambling revenues over time, we require data that are consistently measured over time, and take into account differences in the way gambling revenues are collected over time. We also require data on broader government revenues over time in order to place the role of gambling revenues in context.

Our primary data source for this analysis of government revenues from gambling is the Provincial and Territorial Government Revenue and Expenditures program operated by Statistics Canada. The program combines financial accounts from governmental units at different levels to yield total unduplicated financial statistics, in this case at the provincial level. The program conducts an annual census of provincial and territorial governments including detailed data on revenues and expenditures based on official published financial reports. The data are consistent with the Financial Management System (FMS), an analytical framework designed to produce statistical series describing government finances which are consistent over time and comparable across provinces, developed by Statistics Canada and are available over the period 1989-2008 as CANSIM Table 385-0002.

We define total provincial revenue as Own Source Revenue, an aggregate measure of provincial government revenues that includes income taxes, consumption taxes, property and related taxes,



health and drug insurance premiums, contributions to social insurance plans, the sales of goods and services, and investment income. The measure of gambling revenue from the Provincial and Territorial Government Revenue and Expenditures program is remitted gaming profits, a FMS concept that includes total remitted profits of government owned lottery and other gaming corporations. Government owned lottery, as well as other gaming corporations like the Western Canada Lottery Corporation, operate as monopolies, so their profits are counted as taxes on products, or indirect taxes, in the FMS framework.

In Alberta, the Provincial and Territorial Government Revenue and Expenditures program defines remitted gaming profits as revenues from the Alberta Lottery Fund (ALF). ALF revenues come from slot machines, VLTs and lottery tickets sold in the province. Taxes on casinos and pari-mutual horse race betting are included in amusements taxes in the FMS framework.

Table 5.14: Provincial Gambling Revenues, millions of real 2009 Dollars

Year	Total Own Source Revenues	Gambling Revenues	% From Gambling
1989	\$17,099	\$199	1.2%
1990	\$17,472	\$183	1.0%
1991	\$18,523	\$184	1.0%
1992	\$17,661	\$193	1.1%
1993	\$17,137	\$218	1.3%
1994	\$18,332	\$505	2.8%
1995	\$21,252	\$715	3.4%
1996	\$20,384	\$793	3.9%
1997	\$22,293	\$888	4.0%
1998	\$23,342	\$1,032	4.4%
1999	\$21,269	\$1,101	5.2%
2000	\$24,124	\$1,101	4.6%
2001	\$33,492	\$1,241	3.7%
2002	\$25,271	\$1,343	5.3%
2003	\$26,032	\$1,269	4.9%
2004	\$27,475	\$1,291	4.7%
2005	\$30,524	\$1,416	4.6%
2006	\$36,326	\$1,503	4.1%
2007	\$37,668	\$1,581	4.2%
2008	\$36,821	\$1,614	4.4%
2009	\$36,263	\$1,705	4.7%

Source: Statistics Canada Financial Management System data.

Table 5.14 shows total own source provincial revenues and revenues from gambling in Alberta over the past 20 years. The values on this table are expressed in billions of real, or inflation adjusted, 2009 dollars. Total provincial government revenues have been well over \$35 billion per year since 2006. The important features of gambling revenues are (1) the value of gambling revenues

to the provincial government has grown steadily over this period, especially after the introduction of Video Lottery Terminals in the mid 1990s; (2) gambling revenues have grown faster than other government revenues over this period, as the fraction of government revenues accounted for by gambling has also grown over time; and (3) gambling revenues account for about 4.5% of total government revenues in Alberta.

To place the role of gambling revenues in context for the provincial budget, income taxes currently account for about 35% of provincial revenues, and natural resources taxes, licenses, and royalties account for another 35% of provincial revenues. Although gambling revenues are small relative to these sources, government gambling revenues account for more than twice the revenues generated by alcohol and tobacco taxes, which account for about 2% of provincial government revenues.

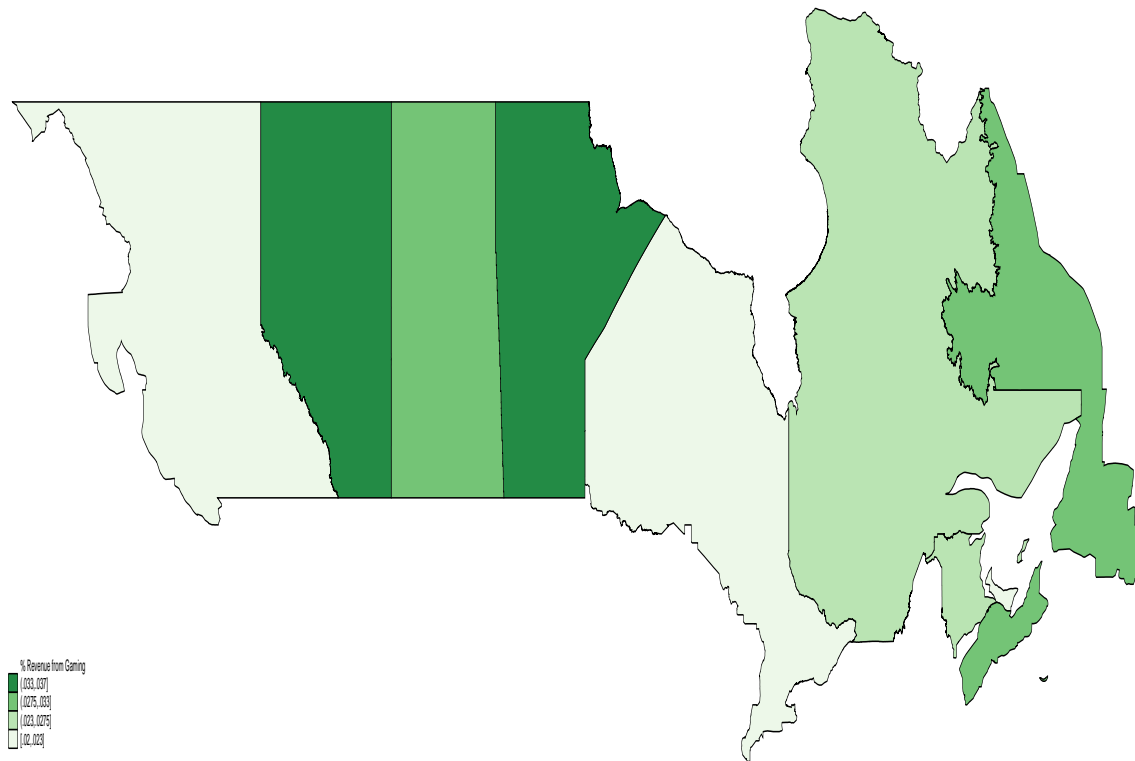
Note that the provincial gambling revenues on Table 5.14 are larger than the estimated household spending on gambling reported on Table 5.3, based on the population of Alberta. The source data for these tables come from different Statistics Canada data collection program. The government revenue data come from the Financial Management System (FMS) while the consumer spending estimates come from the Survey of Household Spending (SHS). FMS data are from a census — all governmental units respond every year — while the SHS is based on a survey and may reflect sampling problems. In addition, the SHS does not include spending on horse race betting but the FMS includes revenues from this source, and the FMS does some data imputation and manipulation to make the reported revenues for different provinces comparable.

Note that Alberta relies more heavily on gambling revenues than many other provinces. Figure 5.2 depicts gambling revenues as a percentage of all own source revenues in Canadian provinces over the period 1989-2009. The darker the shading of the province on Figure 5.2, the larger are gambling revenues as a percentage of own source revenues.

On Figure 5.2, Alberta and Manitoba have the darkest shading, indicating that gambling revenues make up a relatively larger share of own source revenues in these two provinces than in other provinces. Saskatchewan also appears darker than the other provinces; it appears that provinces on the prairies tend to rely more heavily on gambling revenues than other provinces in Canada. However, even in Alberta and Manitoba, gambling revenues make up a relatively small fraction of own source revenues, compared to income taxes and other broad based tax sources.

Another important point to keep in mind when interpreting the importance of gambling revenues to the provincial budget is the fact that these revenues come from an activity that consumers participate in voluntarily. This makes the opportunity cost of this revenue source larger than, for example, the opportunity cost of income taxes and other involuntary taxes. If the government were to eliminate gambling, and the associated revenues generated by, new revenues would have to come

Figure 5.2: Gambling Revenues as a Percent of Own Source Revenues, Canadian Provinces



from involuntary tax sources like increased income or property taxes. To get an idea of where some of the gambling revenues, see, Table C.1 of Appendix C on page 314 which shows the 2009-2010 fiscal year allocations by the Alberta Lottery Fund (ALF) Ministry.

In summary, gambling revenues are a relatively small component of provincial government revenues, and have been growing over time. Gambling revenues are larger than revenues collected from alcohol and tobacco taxes, and should be viewed somewhat differently than other revenue sources because of the voluntary nature of gambling participation.

### 5.7.2 Direct Regulatory Costs

The Alberta Gaming and Liquor Commission (AGLC) regulates the gaming industry in Alberta. As the primary regulatory agency in the province, the AGLC generates most of the direct regulatory costs of the gambling industry in Alberta. As a government agency, detailed budget data are available for the AGLC for every year since its creation in 1995. Given the mission of AGLC, and the availability of budget data for the commission, it would be tempting to simply count the annual budget of the AGLC as the direct regulatory cost of gambling in the province, or, with a bit more

effort, identify specific items in the annual AGLC budget as direct regulatory costs. This would lead to an incorrect estimate of the direct regulatory costs of gambling in the province.

There are two problems with using AGLC budget data to estimate the direct regulatory costs of gambling in the province. First, the agency also regulates the distribution and sale of alcoholic beverages in the province (hence the “L” in the commission’s name) and the direct cost of the regulation of gaming is extremely difficult to distinguish from the direct cost of the regulation of alcohol in the AGLC budget. Even with detailed budget data, for example detailed data on job descriptions and salaries for AGLC employees, the direct cost of the regulation of gaming would be difficult to distinguish from the direct cost of the regulation of alcohol, because the operation of the AGLC, like all government agencies, involves relatively large fixed costs and relatively small variable costs. Two of the four largest operating expenses listed on the 2009 AGLC operating expenses are amortization and “miscellaneous” expenses. Even extremely detailed budget data would not provide enough information to distinguish the direct cost of the regulation of gaming from the direct cost of the regulation of alcohol in these categories.

The second problem can also be clearly illustrated using information from the AGLC annual budget. The AGLC does not just generate regulatory costs. The commission is also directly involved with the generation of benefits that flow from gambling in the province. The third largest cost listed in the AGLC operating expenses is the cost of leading gaming terminal. The AGLC is the owner of VLTs in the province, and provides them to the operators of bars and taverns where they are located. While this is a cost of providing VLT gambling to gamblers in the province, it is not a regulatory cost. Also, the AGLC operating expenses include “media and promotions” and “retail relations.” These activities provide benefits to gamblers in the province, not costs.

The larger issue here is conceptual, and relates generally to SEIG analysis. Current SEIG frameworks identify direct regulatory costs and an important part of the costs of gambling, which they may or may not be. In practice, it is extremely difficult, if not impossible to quantify the direct regulatory costs of gambling; it is also extremely difficult, if not impossible, to separate the benefits generated by government from the costs. From a broader perspective, the inclusion of direct regulatory costs in SEIG analysis rests on equally shaky ground. Suppose the industry being studied was the food industry, which also undergoes strict governmental regulation. Can the regulation of the production of food be thought of as a cost to society? Perhaps, but the regulation of food provides society with safe, and nutritious food with the information needed to make informed dietary choices. The regulatory cost in the food industry is reflected in the price of food, and consumers are willing to pay that price in order to have access to safe and nutritious food and information about the products they are buying. Access to safe and nutritious food, and information about the products, are benefits to consumers, not costs. Singling out the government regulatory cost of food production would inappropriately confuse a benefit with a cost. A similar argument can be made about the AGLC, and the regulation of gaming in Alberta. The AGLC

ensures that fair gaming products are on the market, and that consumers have full information about the odds and pay outs. This provides benefits to consumers of gambling products, not just costs.

## 5.8 Conclusions

The gambling industry is a relatively small sector of Alberta's economy in terms of the value of goods and services produced by firms in the industry. For the ten-year period from 1997 to 2006, the gambling industry accounted for about 0.12% of the overall provincial GDP. In comparison, the oil and gas industry accounted for about 15% of provincial GDP during this same period. Both the provincial GDP and gambling GDP grew significantly during this decade, with provincial GDP increasing from \$265 billion to \$458 billion (220%) and gambling GDP from \$268 million to \$477 million (178%) from 1996 to 2006. Interestingly, while the provincial GDP grew steadily year-over-year during this ten-year period, the gambling GDP decreased from \$587.8 million to \$415.8 million (30%) from 2004 to 2005, only to rebound to \$477 million (15%) in 2006. Unfortunately after 2006, no data are available on the value of goods and services in the gambling industry; therefore, it is not possible to determine if this recent decrease in gambling GDP in Alberta is a trend or anomaly. Nonetheless, the gambling industry grew rapidly over the period 1997-2006 in Alberta. The 8% average annual growth rate of gambling GDP was higher than the overall growth rate of provincial GDP over this period.

The estimated number of establishments in the NAICS national industries comprising the gambling industry decreased in Alberta from 2000 to 2008. In 2008 there were 3 establishments in the Casino Hotel industry, 46 establishments in the Casino Industry, 102 establishments in the Lottery industry, and 73 establishments in the Other Although Gambling industry. The total number of establishments declined in the province over this period, while the number of casinos and the number of casino hotels increased over this period.

In terms of household spending on gambling, evidence from the Survey of Household Spending (SHS) indicates that household spending on gambling is about one half of one percent of total household spending. Alcohol and tobacco accounted for 2.5%; gambling accounts for about as much of household spending as spending on books, magazines and newspapers. An analysis of SHS data shows some emerging trends in Albertans' household gambling expenditure. While there are significant variations in year-to-year household spending on lotteries, casinos and VLTs, bingo, raffles, and all types of gambling combined during the period 1997 to 2008, the following trends are noted:

- Between 50% and 75% of Albertans' spend money on one of these four types of gambling each year. Participation rates and subsequent spending varies amongst the four types of gambling

polled, with lotteries being the most popular form (56%) followed by raffles (37%), casinos and VLTs (20%), and bingo (8%), respectively. While these participation rates have remained fairly consistent over the past decade for lotteries and casino/VLT play, there is a downward trend for raffles and, most significantly, for bingo participation (e.g., a drop from 12% in 1997 to 3% in 2008).

- Albertans change their annual spending on gambling year-over-year. For example annual household gambling on all types of games in 1997 was about \$348; in 2003, \$446; in 2004, \$302; and in 2008, \$305. This variation is more pronounced for gambling than for household expenditure on food by six-fold, when coefficients for variation for both commodities are compared.
- While household gambling expenditures are variable and difficult to predict each year, there appears to be a general downward trend in recent years on expenditures for all types of gambling surveyed in the SHS, with the exception of raffles. This is evident in a comparison of the average household expenditure on gambling for period 1997 to 2003 with 2004 to 2008, as follows

Period	Lotteries	Casinos and VLTs	Bingo	Raffles	Any type
1997-2003	\$166	\$215	\$106	\$58	\$394
2004-2008	\$146	\$175	\$49	\$57	\$318

There is little evidence of statistical association between participating in gambling and additional consumer borrowing to finance gambling. Most gambling spending comes out of current income or savings. Based on the statistical technique of examining instrumental variables (IV), there is no causal relationship between borrowing money to gamble and the type of game being played, with the exception of slot machines. Stated differently, there is evidence that 8% of slot machine players are more likely to borrow money to gamble than individuals who did not play slot machines. The opening of casinos increased both bankruptcy and insolvency rates in the province in the past. Evidence suggests that each additional casino opened in the province over the period 1987-2009 was associated with between 1 and 137 additional bankruptcies per year in the province.

There are numerous studies cited in the literature that attempt to explicate the relationship between personal (consumer) bankruptcy and problem gambling and some of these have been cited in this report. U.S. studies report ranges from 3% to 8% of bankruptcies attributable in part to gambling, while a recent Canadian study (Redish et al., 2006) reports a rate of 2.44%. As we have discussed, there are many problems with both data and measurement associated with this research, and our study suffers from these limitations as well. Based on our analysis of secondary data on bankruptcies in the province; secondary panel data from the province; and our survey data, we offer the following tentative conclusions about the relationship between gambling and household financial problems:

- Consumer bankruptcy rates in Edmonton and Calgary trended steadily upward from around 2% in 1987 for both Calgary and Edmonton to over 4% in Calgary in 1996 and 6% in Edmonton in 1997. Since that time, rates have steadily decreased in both major cities to just over 2% in 2008.
- An analysis of the monetary value of deficiencies (i.e., assets minus liabilities) for all bankruptcies in Alberta shows that the real value of bankruptcies has been increasing steadily from 1987 (\$50 million) to 2008 (almost \$250 million). Using an estimate of 3% synthesized from the literature, an estimate of \$8 million of the actual cost of all bankruptcies in 2008 may be reasonably attributable, at least in part, to gambling problems

Based on our analysis of secondary panel data provided by the Office of the Superintendent of Bankruptcy on bankruptcies in Alberta, we offer the following conclusions:

- On average, there were 1,120 insolvency cases and 1,040 bankruptcy cases in Alberta in each year over the period 1987 to 2009.
- An analysis of bankruptcy and insolvency rates per 1000 population for eight economic regions in Alberta along with the number of casinos in each economic region shows that rates are higher in economic regions with more casinos.
- This analysis of bankruptcy and insolvency rates and casinos suggests a small, but statistically significant increase in bankruptcies and insolvency when a new casino was opened in the province over the past 23 years.

There is little evidence that participating in gambling causes financial distress to Albertans. Buying lottery tickets, scratch off tickets and pull tabs, playing bingo, playing VLTs and casino gambling were not associated with reports of financial distress based on population survey data. Slot machine players were just 3% more likely to report financial distress than people who did not play slot machines.

Based on evidence from our population survey data, the 2008 and 2009 surveys combined contain only 4 individuals reporting declaring bankruptcy because of gambling. Furthermore, only 2% of respondents reported experiencing financial difficulties because of their gambling. Based on the statistical technique of examining instrumental variables (IV), there was no change in the probability of bankruptcy based on type of gambling (i.e., lottery, scratch off tickets, bingo, VLTs, slot machine, casino); however, gamblers who played slot machines were 3% more likely to report financial distress than those who did not play. This effect is consistent with evidence that slot machine players are more likely than non-players to borrow to finance their gambling on these



machines. The analysis of reported financial distress suggests that slot machine play has the largest impact of financial distress; other forms of gambling have little impact on financial distress.

Government revenues from gambling accounted for about 4.5% of total provincial revenues over the period 1989-2009. The fraction of provincial government revenues from gambling grew over the period. Alberta government revenues from all sources have increased dramatically over the twenty-year period from 1989 to 2009. In 1989, provincial revenues totalled \$17 billion and, in 2009, they rose to \$36 billion, for a 212% increase. Similarly, provincial revenues gained from gambling also rose during this period, from \$190 million in 1989 to \$1.7 billion in 2009, for a staggering 855% increase. Growth in the gambling industry has also contributed an increasing proportion of revenue to provincial coffers during this time period. In 1989, 1.2% of all provincial revenues came from gambling, and this has increased significantly to where, in 2009, 4.7% of provincial revenues come from gambling. While this amount is much less than the contributions from income tax and natural resources taxes, licenses and royalties—about 35% from each of these revenue streams—it is nonetheless a significant contribution that eclipses revenues from sources including alcohol and tobacco (2%).

## 5.9 Implications

Participating in gambling activities does not cause financial distress for the vast majority of Albertans; notwithstanding that some individuals undoubtedly experience financial problems associated with their play. In fact, annual household expenditure on gambling represents a very small amount each year when compared with expenditures on other items, such as food, clothing, transportation, entertainment, and alcohol/tobacco. Nonetheless, the analysis of bankruptcy and insolvency rates shows that there is a small increase in both conditions when a new casino was opened in Alberta over the past 23 years. If this relationship holds in the future, it may be expected that about 20 more insolvencies and 25 more bankruptcies will occur in the province each time a new casino is opened. However, increased bankruptcies and insolvencies may be mitigated depending on casino location, size, and types of games offered. These conclusions and implications pertain to personal bankruptcy and insolvency and business bankruptcies/insolvencies and their relationship to gambling have yet to be examined.

Gambling revenue in 2009 accounted for almost 5% of the total provincial revenue from all sources. This revenue is essentially a voluntary tax, as gamblers choose to participate in this activity, with windfall revenues accruing to provincial coffers. Were the Alberta government to choose to eliminate all forms of gambling in the province, some \$1.7 billion would have to come from other sources, most likely in the form of an involuntary tax, such as a provincial sales tax or an increase in personal income tax. Collecting taxes through a voluntary mechanism like lotteries



or casino gambling has a number of advantages over involuntary collection methods like sales or property taxes. First, sales taxes tend to be regressive, because lower income households tend to spend more of their income on items subject to a sales tax than higher income households. Second, involuntary taxes create inefficiencies in the economy, in terms of deadweight loss. Third, generating revenues through sales, property, or income taxes requires significant resources for monitoring and collection. Raising funds through a voluntary activity like gambling avoids a number of these problems. A dollar of government revenue raised through gambling may be significantly less costly to generate than a dollar of government revenue raised through involuntary taxes.

Albertans' interest in gambling seems to have waned in the past 6 years, with between 50% to 75% participating on lotteries, casinos and VLTs, bingo and raffles. Moreover, average household expenditures from each of these gambling activities have decreased during the time period 2004 to 2008 from what they were for the period 1996 to 2003. Elsewhere in this report, we also present data that shows overall revenues from all gambling sources are trending downward. If this early evidence is the beginning of a trend that results in decreased revenues to the provincial government and community groups, it bears monitoring as both recipients rely on these income sources.

## Chapter 6

# Tourism and Recreational Impacts

Gambling can be thought of as a recreational activity that provides participants with satisfaction and enjoyment. Economists call this type of benefit a “consumption benefit” because the participant derives enjoyment from the act of participation, and not from the potential financial gain or loss from the activity. This consumption benefit increases with the quantity and quality of legal gambling opportunities available in the province, and also increases with participation in gambling by Albertans. Although consumption benefits are difficult to measure, they represent an important, and largely overlooked, benefit of legal gambling in Alberta.

In addition, tourism has a significant economic impact on Alberta’s economy. Tourists spend large sums on transportation, accommodation, food and drink, and entertainment in Alberta each year. Tourists choose destinations for a number of reasons, including the travel-related amenities present in communities; tourist amenities in Alberta include scenic locations like the Rocky Mountains, skiing, festivals and concerts, historical sights, museums, and many other characteristics. People clearly like to gamble, implying that the presence of casinos in a province, and the quality of the casinos, could have an effect on tourists’ choice of destination. Las Vegas, Nevada, Monaco, and Macao, in China, stand out as areas that have successfully used gambling to promote tourism and generate significant economic benefits from tourist spending. While Alberta cannot claim to be comparable to Monaco in terms of casino quality, casinos clearly can play a role in tourists’ decisions about travel destinations. This makes it important to assess the relationship between casinos and tourism in Alberta.

Hinch and Walker (2003) identify the impact of casinos as part of a community’s tourism strategy as one of the most under researched areas in the tourism literature. This study examined motivations for gambling at a casino among Alberta residents using survey data. The three most frequent responses to a question about motivation for gambling reported involved socializing with friends or “to just be myself” (Hinch & Walker, 2003, p. 20). In addition, respondents were not

motivated to beat the casino or improve their skill at various games offered at casinos (Hinch & Walker, 2003). These results underscore the importance of understanding the role casinos play in tourism and the decisions made by tourists.

In this section, we assess the relationship between gambling and tourism, and the recreational value of legal gambling opportunities in Alberta. Relatively little attention has been paid to the tourism and recreational impact of gambling in previous socioeconomic impact studies, which we view as a serious omission because most of the impacts in this area are positive. One barrier to any analysis of the relationship between tourism and gambling is a lack of data. Convention and Visitors' Bureaus sometimes conduct one-off "intercept surveys" at various tourist destinations, but such data are not systematic and may suffer from selectivity problems in that the tourists intercepted have already decided to go to that location; they may not be representative of the population. We address these issues by using secondary data sources, including the Travel Survey of Residents of Canada, a large, nationally representative annual survey conducted by Statistics Canada. We first examine the relationship between casinos and tourism before turning our attention to consumption benefits generated by gambling.

## 6.1 Participation in Gambling by Albertans

If gambling can be thought of as a recreational activity, then the consumption benefits generated by gambling are directly related to participation. Although the estimation of consumption benefits is very difficult, the total value of consumption benefits generated by gambling in Alberta is directly related to the number of participants. In general, this consumption value will differ according to the type of gambling, as different gambling activities have different characteristics.

Table 6.1: Participation in Gambling by Type of Gambling Activity, 2008

Gambling Type	Participation Rate	Estimated Participants
Lottery	57.5%	1,506,518
Instant Win	29.8%	432,777
Slot Machines	16.5%	779,391
VLT	12.5%	326,994
Sports Betting	8.9%	233,146
Casino/Table Game	9.0%	236,395
Bingo	5.3%	137,864
Horse Racing	5.5%	143,608

The population surveys carried out as part of this research project asked detailed questions about participation in a number of types of gambling.<sup>1</sup> Table 6.1 summarizes the estimated partic-

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<sup>1</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.

ipation rates and the estimated number of participants in each type of gambling based on data from the 2008 population survey. Lottery tickets are the most popular form of gambling. More than 1.5 million Albertans reported buying at least one lottery ticket in the 2008 survey. Slot machines, instant win tickets, and VLTs were the next three most popular types of gambling. Because individuals report participating in multiple types of gambling, these totals cannot be added up to get an estimate of the total number of participants in gambling. The number of participants in each type of gambling is significant. The amount of consumption benefits generated by participation in each type of gambling will be related to the number of participants, and the more participants, the larger the consumption benefits generated by that type of gambling.

## 6.2 Evidence from the Travel Survey of Residents of Canada

The Travel Survey of Residents of Canada (TSRC) contains comprehensive high frequency data on travel by residents of Canada derived from surveys to provide information about tourism expenditures, activities and destinations, by Canadians. It was developed specifically to quantify the economic impact of domestic travel in Canada, and contains considerable detail on travel related economic activity. The TSRC contains information on the number of people traveling on each trip, the duration, origin and destination of the trip, and expenditure made while on the trip. Detailed expenditure data exist for a number of different expenditure categories. The TSRC data collected on expenditures is broken down into a number of categories, including accommodation, restaurants, recreation and entertainment, among several others - a total of 12 categories altogether. These categories are broad, and can include many different types of spending. For instance, the entertainment spending classification includes spending on admission to theatres, art galleries, and sporting events, as well as gambling expenditures. We focus on travel-related expenditure in ten different expenditure categories: accommodation, vehicle rental, vehicle operation, local transportation, clothing and footwear, purchase of food and beverage in restaurants, purchase of food and beverage in stores and shops, spending on sports and recreation, spending on entertainment, and spending on package tours. It also contains descriptors for the type of trip, allowing researchers to distinguish business trips from pleasure trips.

The TSRC collects data at the monthly frequency on trips that ended during the previous month. The survey typically contains six to ten thousand observations per month. Prior to 2006, Statistics Canada operated a similar survey, called the Canadian Travel Survey (CTS). The CTS survey was modified between 2004, the last year of the CTS, and 2008, the most recent year of data available for the TSRC. The transition from the CTS to the TSRC was motivated by a desire to conform to international standards for collecting tourism data. The data from 2005, the first year of the TSRC, was not considered suitable for public release, and the 2006 data also had comparability problems. We use data from the 2007 and 2008 surveys.

Table 6.2: Visitors to Alberta and Casino Visits

	2007	2008
Total Tourists Visiting Alberta	5,898,000	5,201,000
Tourists Visiting a Casino	317,000	252,000
Percent of Tourists Visiting Casinos	5.4%	4.8%
Average Distance Traveled (km)	1,012	988
Average Distance Traveled, Casino Visitors	1,074	1,225

Table 6.2 presents summary statistics about the number of tourists visiting Alberta each year from other parts of Canada, the fraction of these visitors who reported going to a casino during their visit, and the average distance traveled by visitors in the two groups, based on data from the TSRC. Alberta averaged about 5.5 million visitors a year over this period, and between 4.8% and 5.5% of them reported visiting a casino in Alberta during their visit. Note that in 2007 and 2008 visitors to Alberta who went to casinos traveled farther, on average, than visitors who did not go to a casino to get to Alberta, and the average distance traveled by tourists who reported visiting a casino increased. This may be due to the opening of First Nations casinos in the province in 2006, which could have had a significant impact on interest in casino gambling in the province, as the casinos on First Nations land had different characteristics than charity casinos in the province, in terms of games, limits, and the ability to smoke in the casino.

From Table 6.2, an average of about 284,000 visitors to Alberta each year reported going to a casino during their trip. This represented a bit over 5% of visitors to Alberta, on average. The TSRC also contains considerable detail on spending in a number of categories. Table 6.3 contains summary data on the spending of tourists in Alberta who reported visiting a casino during their visit to the province in 2007 and 2008. We do not report expenditure from 2006 because of a change in the way expenditure data were collected in the TSRC that began in 2007. Before 2007, the TSRC relied on the recall of participants to provide details of activities undertaken on trips. In 2007 the interviewers began prompting participants with a list of relevant activities and recording their responses. This resulted in a far higher reported incidence for all activities, making it difficult to compare detailed expenditure data to earlier years.

Based on the estimates reported on Table 6.3, visitors to Alberta from other provinces in Canada who reported going to a casino while on their trip spent about \$83,000,000 in 2007, and about \$90,000,000 in 2008. Albertans who reported going to a casino while on their trip spent about \$79,000,000 in 2007 and 2008 in the province. Note that these estimates understate the total amount spent on travel that involved visiting a casino, as only Canadians are included in the TSRC data. Spending by visitors from outside Canada are not captured in the TSRC data. Visitors who reported going to a casino spent the most money on vehicle operation (primarily the purchase of fuel), accommodation, food and beverages in bars and restaurants, and the purchase

Table 6.3: Total Casino-related Travel Expenditures in Alberta

Spending Category	Albertans		Other Canadians	
	2007	2008	2007	2008
Accommodation	\$21,300,000	\$19,500,000	\$18,000,000	\$14,900,000
Vehicle rental	\$78,294	\$207,311	\$1,721,962	\$1,145,496
Vehicle operation	\$11,700,000	\$15,700,000	\$12,400,000	\$13,100,000
Local transportation	\$658,806	\$796,684	\$512,441	\$1,555,872
Clothing/footwear	\$8,051,399	\$9,364,172	\$12,000,000	\$20,200,000
Restaurant food/bev	\$23,400,000	\$15,700,000	\$23,700,000	\$20,700,000
Stores food/bev	\$3,527,234	\$5,051,189	\$4,985,005	\$5,704,907
Sports/recreation	\$4,031,768	\$572,491	\$2,461,466	\$2,791,142
Entertainment	\$5,546,139	\$12,000,000	\$3,013,635	\$6,331,712
Package travel	\$508,329	\$287,220	\$4,118,991	\$3,293,417
Total	\$78,801,969	\$79,179,067	\$82,913,500	\$89,722,546

of clothing and footwear, which includes souvenir clothing. Actual spending in a casino is reflected in the “entertainment” category, and in the “accommodation” category if the visitor stayed in a casino hotel. Although all the spending summarized on Table 6.3 cannot be directly attributed to casinos, the fact that these visitors went to a casino suggests that the presence of casino gambling played some role in the travel.

Of course, Albertans also travel outside the province, and some of them visit casinos while traveling. Table 6.4 summarizes spending by Albertans who reported visiting a casino while traveling outside the province in 2007 and 2008, based on data from the TSRC. Albertans who report visiting a casino while traveling spend considerably more on travel outside the province than in the province, and much more on travel in the US than in Canada.

Table 6.4: Travel Expenditure by Albertans who Visited Casinos

Spending Category	Other Provinces		United States	
	2007	2008	2007	2008
Accommodation	\$31,200,000	\$9,423,513	\$85,400,000	\$107,000,000
Vehicle rental	\$2,968,943	\$1,853,621	\$7,979,958	\$8,676,525
Vehicle operation	\$21,000,000	\$17,800,000	\$16,500,000	\$15,200,000
Local transportation	\$686,870	\$475,202	\$4,816,328	\$6,271,673
Clothing/footwear	\$8,028,689	\$5,778,023	\$41,900,000	\$55,900,000
Restaurant food/bev	\$23,900,000	\$29,200,000	\$57,700,000	\$70,700,000
Stores food/bev	\$5,639,938	\$9,946,524	\$11,300,000	\$13,600,000
Sports/recreation	\$2,990,224	\$6,721,166	\$14,700,000	\$28,400,000
Entertainment	\$4,719,228	\$7,991,543	\$27,200,000	\$45,300,000
Package travel	—	\$2,557,478	\$65,400,000	\$110,000,000
Total	\$101,133,892	\$89,189,592	\$267,496,286	\$351,048,198

An examination of the total rows from Table 6.3 and Table 6.4 reveals that Alberta was a net exporter of casino-related travel spending in 2007, when Albertans spent about \$101 million in other provinces while Canadians from outside Alberta spent about \$83 million in the province. However, these amounts equalized in 2008 at \$89 million. Note from Table 6.3 that the increase in spending by Canadians from outside Alberta who visited a casino in the province from 2007 to 2008 was primarily in the “entertainment” category that includes most of the spending that takes place in casinos. Table 6.4 also reveals that Albertans who travel to the US and report visiting a casino spend a substantial amount of money outside the province. In 2008, Albertans who traveled to the US and reported visiting a casino spent more than \$200 million on their travel. To the extent that casino gambling played a role in Albertan’s decisions to travel outside the province, it is possible that some of this spending by Albertans in the US could be kept in the province, leading to increased economic benefits, if the number and quality of casinos in the province was increased.

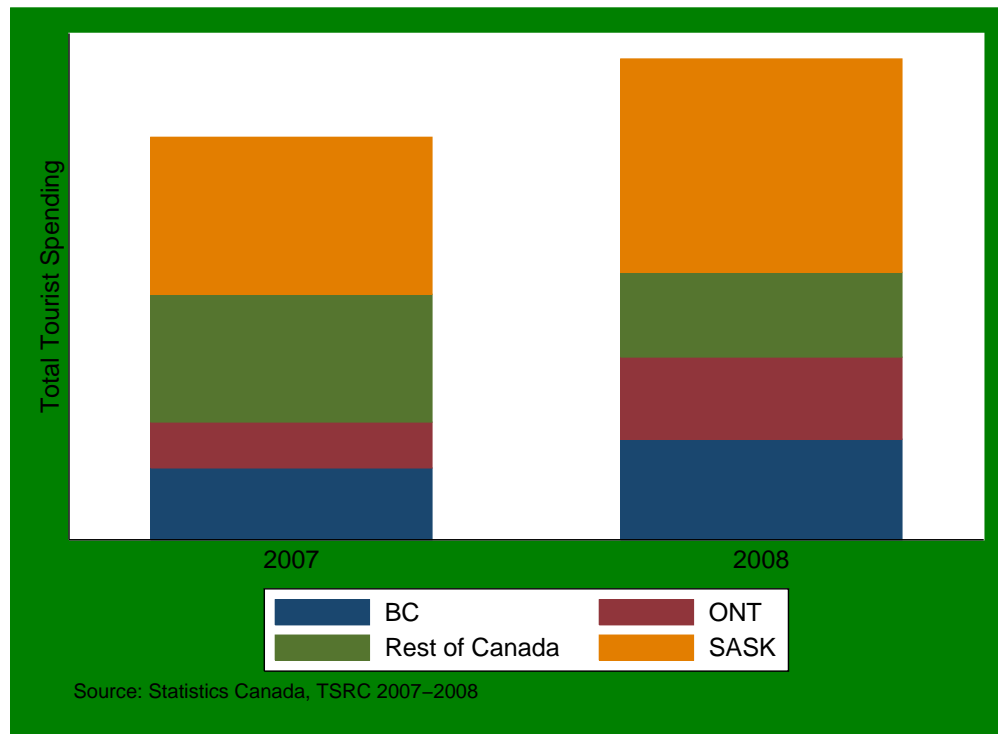
Figure 6.1 provides additional detail about travel spending in Alberta made by residents of other provinces who traveled to Alberta and reported visiting a casino. The figure shows spending by province of origin of the travelers. Most of the casino-related travel spending in Alberta comes from residents of Saskatchewan, followed by British Columbia. This is not surprising, given that these two provinces border Alberta. This does indicate that many casino visitors in the province come from nearby provinces, suggesting that the economic benefit from casino-related travel could increase if the quantity and quality of casinos in the province increases in the future.

In summary, visits to casinos in Alberta are associated with a large amount of tourist spending each year, and several hundred thousand tourists report visiting casinos in Alberta each year. While we cannot determine the extent to which the presence of legal casino gambling in Alberta contributes to tourists’ choice of a province to visit, we find that the existing evidence suggests that visits to casinos are an important part of the experience of visitors to the province, and that a significant amount of positive economic impact, in terms of tourist spending and the jobs supported by this tourist spending, can be linked to the presence of legal casino gambling. In addition, increases in the quantity and quality of legal casino gambling in the province are likely to lead to additional tourists choosing to visit the province, and to additional economic benefits to residents of the province.

## **6.3 Evidence on the Recreational Value of Casinos in Alberta**

Gambling represents a recreational activity for the vast majority of people who participate. This impact is an important impact and one that is often overlooked by researchers examining the social and economic impacts of gambling. The analysis of gambling participation in specific types of gambling in Chapter 11 on page 193, Chapter 12 on page 203, Chapter 13 on page 215, Chapter 14

Figure 6.1: Travel Expenditure in Alberta by Province of Origin



on page 223, and Chapter 15 on page 233 indicate that millions of Albertans participate in some form of gambling activity every year. Research from economics shows that utility or satisfaction, and not expected monetary gains, represents an important reason that people choose to gamble (Conlisk, 1993), suggesting that this participation generates a significant amount of satisfaction among nearly all of the participants.

We estimated the access value, which can be interpreted as the consumer surplus, for casinos in Alberta by applying a standard travel cost model to data from the Travel Survey of Residents of Canada. Details on data contained in this survey can be found in the previous section and technical details on the regression model used can be found in Appendix F. Parsons (2003) contains an excellent and thorough summary of the use of travel cost models to estimate the access value of recreational activities. This approach has been used to place a monetary value on access to a variety of recreation-related locations like beaches and parks. The travel cost model is based on demand for some recreational activity that takes place at a specific site, in this case trips to casinos, and can be interpreted like a standard economic demand model. In this case, demand is measured by the number of trips taken to a casino over some period of time, and the price of the activity is the cost of traveling to the site. Based on the number of trips taken to a site and the cost of those trips, the travel cost model can be used to estimate the consumer surplus generated by a site.

Consumer surplus is the difference between the actual price paid for a good or service by



an individual and that person's willingness to pay for that good or service. In most instances, willingness to pay exceeds the actual price of a good or service. For example, an fan of one of the National Hockey League teams in Alberta might place a very high willingness to pay for a ticket to a game played by one of those teams, but would only have to pay the face value of a ticket. If an Albertan had a willingness to pay for a ticket to an Oilers or Flames game of \$250, but only had to pay \$50 for a ticket, then the consumer surplus generated by that activity for that individual would be \$200, the difference between willingness to pay and price. Consumer surplus can be interpreted as an estimate of the recreational value of an activity. Since we observe the number of trips made to casinos by Canadians, the cost of making those trips, and the characteristics of the travelers in the TSRC, we can use these data, along with a standard travel cost model, to estimate the average consumer surplus generated by a trip to a casino by a gambler in Canada, as well as to estimate of the total consumer surplus generated by casinos in the province.

In order to estimate access value, in terms of the average consumer surplus associated with visits to Casinos in Canada, we use a subsample of observations from the TSRC in 2007 and 2008 composed of only same day trips for which the most important activity was visiting a casino. The TSRC data contained 588 such trips in the sample period. The TSRC contains weights that can be used to generalize results obtained from these survey data to the population of Canada. We used these weights when estimating the recreational value of casino gambling. The basic approach uses a regression model to estimate the price elasticity of demand for trips to casinos in Canada, and then, using this price elasticity estimate, to calculate the access value for each individual for each trip in the sample and, based on that estimate, place a dollar value on the consumer surplus. The regression model used to estimate consumer surplus controlled for characteristics of the travelers, including age, education, income, employment status, province of residence, and the distance traveled for each trip.

The parameter estimates from regression models are random variables that are best expressed in terms of confidence intervals, not as single numbers or point estimates. While it is possible to generate a specific value for regression parameter estimates, it is more informative to express them in terms of confidence intervals. The standard confidence interval for regression analysis is 95%. The interpretation of a 95% confidence interval is that, in statistical terms, based on the available data and model, the researcher is 95% confident that the true parameter - in this case the average access value of a visit to a casino - lies in the confidence interval. There is also a small chance, in this case 5%, that the true parameter lies outside this interval, but random variation prevented the regression model from accurately estimating the true parameter. Confidence intervals are defined by an upper and lower bound, which is simply a particular value calculated from the parameter estimate and standard error of the estimate.

Table 6.5 summarizes the results of the regression based estimates of the consumption value of legal casino gambling in Alberta, based on TSRC data from 2007 and 2008. The first column

contains estimates of the consumer surplus generated by each trip to a casino in Alberta. Again, this is a dollar value estimate of the difference between the willingness to pay for a trip to a casino and the actual travel cost of visiting a casino in Canada. It represents the average difference between the average Canadian's willingness to pay for a visit to a casino and the average amount spent on the trip. This can be interpreted as an estimate of the consumer surplus generated by the casino visit. Based on the 2007 and 2008 TSRC data, this consumer surplus, or access value, was between \$367 and \$392 per trip. The average distance traveled on these trips was 172 kilometers and the average actual travel cost of the trip was \$32. Access to legal casinos generates substantial consumer surplus. The size of this estimated consumer surplus explains why people are willing to travel to casinos to gamble, even though the expected financial outcome from the actual gambling done at casinos is negative. The estimated consumer surplus indicates that a trip to a casino would generate enough consumer surplus to offset more than \$350 in gambling losses on the trip. The results indicate that trips to casinos generate substantial consumer surplus for Canadians.

Table 6.5: Estimated Access Value From Casinos in Alberta, Real 2008 Dollars

Evaluation Point	Access Value Per Casino Visit	Total Provincial Access Value
Lower Bound, 95% CI	\$368	\$104,630,906
At Parameter Estimate	\$380	\$108,163,543
Upper Bound, 95% CI	\$393	\$111,696,208

The second column contains estimates of the total value regarding the consumer surplus generated each year, on average, in Alberta. To arrive at this estimate, we use the estimated access value for each casino trip in Canada from the second column on Table 6.5 and the average number of casino trips in Alberta reported on Table 6.2 above. On average, the TSRC data suggest that 284,000 visits to casinos were made in Alberta each year. Again, this under estimates actual visits because it includes only Canadian tourists who reported visiting a casino in Alberta during their visit. The estimates indicate that the total consumer surplus generated by casino visits each year in Alberta is valued between \$104 million dollars and \$111 million dollars. These estimates indicate that the presence of legal casino gambling in Alberta generates a substantial amount of consumer surplus annually.

A brief survey of other estimates of consumer surplus generated by recreational activities will help to place these estimates in context. Bowker, English, and Donovan (1996) estimated the consumer surplus generated by guided white water rafting trips in the US at between \$89 and \$286 (in US dollars). Offenbach and Goodwin (1994) estimated the consumer surplus generated by hunting trips in Kansas at \$170 (in US dollars) per trip. Boxall (1995) estimated the consumer surplus of a permit to hunt big game in Alberta at between \$28 and \$64 dollars based on data from 1986; in current dollars, that would be between \$86 and \$205.

In summary, tourism is a vital component of the gambling industry, both in Canada and around the world (Hinch & Walker, 2005). Alberta attracts a large amount of visitors from other provinces in Canada to its casinos. However, Albertans also travel to casinos in other provinces and abroad, which represents money flowing out of the province related to gambling. An estimate of the net difference between spending by other Canadians in Alberta's casinos and spending by Albertans in casinos outside the province produced mixed results. In this chapter, we also estimate the consumer surplus generated by travel to Alberta casinos. Based on data from the TSRC, we find that the consumer surplus generated by visits to casinos ranges between 104 and 111 million dollars per year in the province. This presents a substantial positive impact that legalized casinos have in Alberta.

This estimate is based on only travel costs, and does not include other potential sources of consumer surplus directly related to gambling. Because of this, it both understates the total consumer surplus, and also overstates effective consumer surplus because we cannot identify problem and recreational gamblers in our travel cost data. The Australian Government Productivity Commission (1999) produced a comprehensive estimate of net consumer surplus generated by gambling in Australia that accounted for both consumer surplus generated by recreational gamblers and losses attributed to problem gamblers. We lack the data to generate such estimates, which rely on knowledge about how consumers' decisions to gamble vary with the effective price of gambling. This estimate from Australia was between 4.3 and 6.1 billion Australian dollars in 1997-1998. This is equivalent to between \$259 and \$356 Canadian dollars per person in 2010 at the average exchange rate between the Australian and Canadian dollar in 2010. Put another way, if the Australian Productivity Commission's estimate of consumer surplus from gambling in the 1990s can be applied to Alberta in 2010, then there is an additional one billion dollars of consumer surplus generated from gambling in the province each year, net of the losses in consumer surplus attributable to problem gamblers. Again, our estimates and this back-of-the-envelope calculation based on estimates from Australia suggest significant access value and consumer surplus attributable to legal gambling in the province.

## 6.4 Evidence on Gambling and Other Recreational Activities

If gambling is a recreational activity, then the extent to which gambling can be a substitute for other recreational activities is an important topic. As part of the population surveys carried out during this research, a question was included to assess the substitutability of gambling and other recreational activities.<sup>2</sup> The population surveys contained the following question:

*Has gambling replaced other recreational activities for you in the past 5 years?*

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<sup>2</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.

The answers to this question can be used to assess the relationship between gambling and other recreational activities. If individuals answer yes to this question, then evidence exists that participation in gambling reduces other recreational activities. Table 6.6 summarizes the responses to the question about the relationship between gambling and other recreational activities by the CPGI category of the respondent. From Table 6.6, the only substitution between gambling and other recreational activities takes place in the “At Risk,” “Moderate Problem Gambling Risk” and “Severe Problem Gambling Risk” categories in the CPGI. Among recreational gamblers, very little substitution appears to take place between gambling and other recreational activities. For the vast majority of Albertans, gambling is just another recreational activity, and not an activity that takes the place of other recreational activities.

Table 6.6: Reported Frequency of Gambling Replacing Other Recreation by CPGI Category

Gambling Replaced Other Recreation	CPGI Category				
	Non-gamblers	Non-problem	At Risk	Moderate	Severe
No	100%	98%	92%	81%	43%
Yes	0%	2%	8%	19%	57%

*Source: SEIGA population survey 2008*

Statistical analysis of survey data containing questions about activities like changing patterns of recreational activities and gambling must be undertaken carefully. Choices about recreational activities and gambling are made simultaneously, and a number of unobservable factors affecting both decisions exist that can confound the statistical relationship between these variables. Because of these factors, simple unconditional statistical analysis, like tests of means, as well as conditional statistical analysis, like standard regression models and factor analysis, may yield misleading results about statistical relationships in survey data. Some disciplines overcome these problems by using random assignment of subjects into treatment and control groups. In this case, we cannot randomly assign individuals into groups of gamblers and non-gamblers to assess the relationship between gambling and other variables of interest.

Several well-established statistical techniques exist to overcome the problem of simultaneous determination of economic variables in survey data and omitted variables problems. One widely used approach is the method of Instrumental Variables (IV). In general, instrumental variables methods use a two-step approach to address statistical problems associated with simultaneous determination and omitted variables problems. In the first step, some variable of interest, in this case participation in gambling, is “identified” through a regression model that is used to statistically predict the outcome of this variable. This predicted value of the first variable of interest (gambling participation in this case) is, by construction, statistically unrelated (orthogonal) to any unobservable factors that affect the second variable of interest, in this case, reported changes in recreational activities. In the second step, the relationship between the predicted value of the first variable

of interest (the predicted probability of each individual in the sample participating in gambling) and the second variable of interest (reported changes in recreational activities participated in ) is analyzed using a regression model. When using the IV method, the statistical relationship between the predicted values of the first variable of interest and the second variable of interest can be interpreted as causal, and not simply correlative, assuming that gambling participation was properly identified. The IV method has been widely used in economics, health and social sciences, and other areas where secondary data analysis without random assignment is common. Angrist, Imbens and Rubin (1996) describe the IV approach as applied in this setting, and provide a detailed discussion of the technique. Appendix E contains details about the IV models used in this report.

The key issue for implementing IV is to statistically identify the variable of interest. In IV models, identification comes from a variable that explains the observed outcomes of the first variable of interest but is statistically unrelated to unobservable factors that affect second variable of interest. This variable is called an “instrument” in the jargon of statistics. In this case, we seek an instrument that explains an individual’s decision to participate in gambling but is unrelated to all observable and unobservable factors that affect an individual’s decision to change their recreational activities. Finding appropriate instruments is not an easy process, and in many cases, a suitable instrument does not exist to identify a variable of interest. In this case, we exploit information about where individuals live, and proximity of their residence to a casino in the province, to identify gambling participation.<sup>3</sup> In particular, we calculated the driving distance between the postal code of the residence of each individual in the population survey and the nearest casino. We assume that this distance statistically explains individuals’ decision to gamble but is unrelated to individuals’ decisions to change consumption. If this assumption holds, then we have statistically identified gambling participation, and can make causal statistical inferences about the effect of gambling on changing consumption. Note that this assumption requires that casinos are sited independently of the spatial distribution of a person’s consumption habits in the province and that individuals do not select their residence based on proximity to a casino. Appendix E contains details about the IV regressions used, including diagnostic assessments of the strength of this instrument.

From Table 6.6, in the 2008 population survey, only individuals in the elevated risk of gambling CPGI categories reported changing their recreational activities in response to gambling over the past 5 years. We used instrumental variables to assess the relationship between participation in different types of gambling and the likelihood that an individual reported changing the type of recreational activities participated in to gamble more. We estimated separate IV models that treated six different types of gambling as endogenous: lottery, scratch off lottery, bingo, slot machine play, VLT play, and casino gambling. The first stage regression included the distance to the nearest casino and explanatory variables identified in the literature as important for explaining gambling:

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<sup>3</sup>Jennifer Arthur of the University of Lethbridge calculated the driving distance between the postal code of the residence of each person in the population survey and the closest casino. We acknowledge and thank her for this hard work.

age, marital status, gender, level of education, employment status, income, and ethnicity. The second stage regression was a probit model with an indicator variable for borrowing money to pay gambling debts and the other explanatory variables from the first stage. Driving distance to the nearest casino was excluded from the second stage probit model. Table 6.7 summarizes the results of the IV estimation of the relationship between gambling and changes in patterns of participation in recreational activities for the six types of gambling activities. Table 6.7 reports the marginal effect of participating in each type of gambling on the probability that an individual reported replacing other recreational activities with gambling over the past 5 years. Recall that these IV results can be interpreted as causal.

Table 6.7: The Effect of Gambling on the Probability of Changing Recreational Activities

Type of Gambling	Change in Probability that an Individual Reported Gambling Taking the Place of Other Recreational Activities
Lottery Ticket Purchase	No Change
Instant Win Ticket Purchase	No Change
Bingo	No Change
Video Lottery Terminal Play	No Change
Slot Machine Play	+0.20%
Casino Gambling	+0.47%

Table 6.7 contains plausible and interesting results. Different types of gambling activities take different amounts of time, yet each individual faces a time constraint that limits the number of recreational activities that can be participated in. Bingo, VLT play, slot machine play, and casino gambling take considerably more time than lottery ticket or instant win tickets. Buying lottery or instant win tickets was not associated with any substitution in recreational activities. But playing slot machines and going to casinos were associated with a slightly higher probability of substituting gambling for other recreational activities. Interestingly, participating in bingo and VLT play are not associated with any reduction in other recreational activities. This may be due to the fact that many VLTs, and some bingo halls, are located in rural areas with limited recreational activities, especially in winter in Alberta. VLT play does not take the place of other recreational activities because few alternative recreational options are available in rural parts of the province. Section 19.2.1 on page 259 in Chapter 19 later in this report contains supporting evidence about entertainment value provided by VLTs in less densely populated regions of the province.

In summary, gambling does not appear to be an important substitute for other recreational activities in Alberta, based on data from the 2008 population survey. Instead, gambling is simply one of a number of different recreational activities pursued by Albertans from all walks of life, in all parts of the province. The only exception may be among individuals falling in the “At Risk,” “Moderate Problem Gambling Risk” and “Severe Problem Gambling Risk” categories in the CPGI.

These individuals may substitute slot machine play and casino gambling for other recreational activities.

## 6.5 Conclusions

Tourists spend large sums on transportation, accommodation, food and drink, and entertainment in Alberta each year. Tourists choose specific destinations for a number of reasons, including travel-related amenities present in communities; tourist amenities in Alberta include scenic locations like the Rocky Mountains, skiing, festivals and concerts, historical sites, museums, and many other characteristics. We use data from the Travel Survey of Residents of Canada (TSRC) to investigate the relationship between gambling in Alberta and tourism. We also use data from the TSRC and out population surveys to investigate the recreational value of gambling in the province.

The Travel Survey of Residents of Canada (TSRC) shows that, in 2007 and 2008, Alberta averaged about 5.5 million visits per year from Canadians from other provinces. During this time period, about 5% of these Canadian visitors spent time in Alberta casinos. While it is unlikely that other Canadians visited the province for the main purpose of frequenting a casino, the number of visits from other Canadians to Alberta casinos is nonetheless significant—an estimated 285,000 visits on average annually. An average of about 236,000 visitors to Alberta each year reported going to a casino during their trip. This represented a bit over 4% of visitors, on average.

Albertans and Canadians who report visiting casinos in Alberta in 2007 and 2008 report spending, on average, about \$79 million and \$86 million, respectively, on a variety of items, including accommodation, vehicle rental, restaurant food/beverages, and entertainment. It is not possible to determine the actual amount Albertans and other Canadians spent at casinos, as this figure is included in the aggregate of all spending on “entertainment.” However, it is interesting to note that, when traveling, Albertans spent, on average, about \$9 million annually on all entertainment, with other Canadians spending about \$5 million. These spending estimates lead to two conclusions. First, it is evident that both Albertans and other Canadians spend a proportionately smaller amount on “entertainment” (about 11% and 5%, respectively) than on other goods and services when traveling within the province each year. Second, if these proportions hold for casino expenditures as a part of all entertainment spending, it appears that Albertans may spend about two times more on casinos when they travel in the province than do Canadians visiting from other provinces. Visitors to Alberta from other provinces in Canada who reported going to a casino while on their trip spent about \$83,000,000 in 2007, and about \$90,000,000 in 2008.

The TSRC also tracks Albertans’ spending while traveling outside the province, both to the United States and other Canadian provinces. In 2007 and 2008, Albertans spent, on average, \$95



million annually on visits to other provinces and \$309 million on visits to the United States. Total spending on entertainment, including visits to casinos were, on average, \$6 million for Canadian travel and \$36 million for U.S. travel. These data show that Albertans spend more money annually when traveling in the United States than in other Canadian provinces, and this includes spending on entertainment (\$13 million vs \$73 million) which also encompasses casino spending. Another important conclusion is that Albertans tend to spend more when traveling in other provinces or the U.S. than they do traveling in their own province, and this includes on entertainment and, most likely, casinos. Most of the casino-related travel spending in Alberta comes from residents of Saskatchewan, followed by British Columbia.

In this study, the methodological procedure of applying a travel cost model to the Travel Survey of Residents of Canada data was used to determine the recreational value of casino gambling in Alberta. The concept of “consumer surplus” is also considered in this analysis. Consumer surplus is the amount an Albertan would be willing to pay for, say, an NHL hockey ticket or, in this analysis, an opportunity to gambling at a casino net of the actual amount he or she actually paid. The travel cost analysis shows that Albertans are prepared to travel about 170 km and pay between \$367 to \$392 for an opportunity to gamble at a casino. The real travel cost is estimated to be about \$32 per trip; therefore, the difference—consumer surplus—ranges from \$104 to \$111. This means the gambler is likely willing to spend an estimated \$350 over and above the trip cost to gamble and/or purchase other goods and services (e.g., restaurant food, entertainment tickets) while at the casino. It may be concluded that the total consumer surplus generated (i.e., the willingness of Albertans to pay for this casino gambling recreational opportunity) is substantial.

The population surveys conducted as part of this research contain little evidence that gambling is a substitute for other recreational activities. Increased gambling opportunities in the province do not reduce participation in other types of recreational activities.

## 6.6 Implications

Based on the Travel Survey of Residents of Canada, a relatively weak argument can be made for increasing the number of casinos in the province to capture additional visitor dollars. Analysis of the the TSRC data shows that both Albertans and other Canadians who travel throughout the province spend a proportionately lesser amount on all “entertainment” items, including casinos, than they do on other goods and services, notably accommodation, restaurants, fuel, vehicle rentals and other such items. Furthermore, the total amount of entertainment spending is also relatively small, estimated at about \$11 million for traveling Albertans and \$5 million for other Canadians. While the argument to increase casino gambling on these grounds is weak, there may be a case to be made for establishing a multi-purpose, high-end “destination” casino, perhaps in a picturesque



setting such as Banff. Even in this idyllic setting, visitors are more likely to find the appeal of the Rockies to be a more important attraction than a casino, so it would remain to be seen whether the investment in, say, a billion dollar destination casino would pay off for the province. In any case, casinos play an important role in travel and travel spending in Alberta.

The willingness of Albertans to pay to gamble at provincial casinos—the consumer surplus—is estimated to total between \$74 and \$166 million per year. This suggests the casino industry generates significant intangible benefits for recreational gamblers and there is an opportunity to increase the number of casinos to take advantage of this significant consumer surplus. Stated differently, many Albertans are willing to pay a significant amount for the opportunity to gamble at a provincial casino and, while an increase in casino opportunities might affect the total consumer surplus generated, there is still some room for expansion before the aggregate consumer surplus is wiped out due to casino saturation.

## Chapter 7

# Employment Impacts

### 7.1 Overview

This chapter assesses the employment impact of gambling in Alberta. While a general perception exists that the gambling industry accounts for a large number of jobs in the province, little evidence exists to support this idea. Estimating the employment impact of gambling appears to be a relatively straightforward exercise. The province requires employees in the gaming industry to register as a precondition of employment, which would appear to facilitate the analysis of the employment impact of gambling in the province.

However, the registry of gaming employees is static and contains relatively few details about registered gaming employees. Registered gaming employees are seldom removed from the registry, even when they change jobs and leave the industry. The existing records on registered gaming employees in the province lacks sufficient detail to produce un-duplicated counts of employees at licensed gaming facilities. In addition, the registry of gaming workers does not contain information about where registered gaming workers were employed before taking a job in the gaming industry in Alberta. The gaming industry has expanded rapidly in the province since the introduction of casinos in the early 1980s, and with this expansion has come the creation of new jobs in the province. In order to assess the employment impact of this expansion, information about previous employment history is needed.

In addition, the gaming industry extends beyond licensed gaming facilities. Section 5.6.2 on page 87 shows that, in 2008, there were three casino hotels, 46 establishments in the casino industry (including establishments related to casino gambling that are not licensed gaming facilities), 102 establishments in the lottery industry, and 73 establishments in the “other” gambling industry.

Many of these establishments do not employ registered gaming employees, so the registry would not be of much use in estimating total employment in the gaming industry.

Faced with these limitations, we turned to an analysis of secondary data to assess the employment impact of gambling in Alberta. Statistics Canada conducts a large number of high frequency surveys that contain a rich amount of information about labour market outcomes at low levels of geographical detail. We assess the employment impact of gambling using data from three secondary sources: Canadian Business Patterns, the Survey of Wages, Payroll, and Hours, and the Labour Force Survey. These surveys allow us to track a number of different labour market outcomes in the gaming industry, including employment, hours worked, compensation, and specific characteristics of jobs and workers in the gambling industry, over a long period of time and in considerable detail.

Note that we do not attempt to estimate the indirect employment effects of the gambling industry in Alberta. The gaming industry does not exist in a vacuum. Inter-industry connections are important features of industrial economies; establishments in the gaming industry purchase goods and services from other industries, and the output of the gaming industry can be viewed as an entertainment good that may have a number of substitutes in consumer demand. The estimate of total payroll in the gambling industry developed below is relatively large, suggesting that employees in the gambling industry have considerable disposable income to spend on other goods and services. In principle, we could use a multiplier approach derived from input-output tables to estimate the indirect and induced employment effects of the gambling industry. However, no easily available regional input-output analysis software currently exists in Canada, and multipliers derived from input-output models have a number of well established limitations. Future research could address this limitation.

## **7.2 Estimates of Employment in the Gambling Industry**

### **7.2.1 Evidence from Canadian Business Patterns**

The Canadian Business Patterns (CBP) is an annual census of businesses in Canada produced by Statistics Canada. CBP data are available since 2000 and contain detailed information on the number of businesses across relatively small geographic areas, including provinces, census divisions, census subdivisions, census agglomerations, and metropolitan areas. The geographic regions in Alberta are discussed below, in Chapter 19 on page 258. In this section, we develop evidence about employment in the gambling industry from CBP data.

CBP contains data about establishments based on the North American Industrial Classification System (NAICS). The NAICS is a taxonomy of businesses in Canada, the United States and Mexico.

The NAICS classifies establishments into broad two digit codes, called industries (manufacturing, retail trade) as well as more detailed classifications within each two digit industry. Section 5.6.1 on page 85 describes how gambling establishments can be identified in the NAICS using six digit NAICS codes. Six digit NAICS codes identify very specific groups of establishments, and in many cases, very few establishments exist in any specific five digit NAICS code industry at sub-national geographic areas like provinces. When a NAICS code contains a sixth digit, the final digit identifies a national industry, which can differ in Mexico, Canada and the United States. Casino hotels fall under a different NAICS code from the rest of the gambling industry and data at the 6-digit level allows us to identify casino hotels as part of the gambling industry in Alberta.

The CBP data contains counts of establishments by eight specific ranges of number of employees at the establishment: 1 to 4 employees, 5 to 9 employees, 10 to 19 employees, 20 to 49 employees, 50 to 99 employees, 100 to 199 employees, 200 to 499 employees, and over 500 employees. The CBP also contains establishment counts for an indeterminate employment size category that captures businesses like sole proprietorships and partnerships that do not employ other people. Like in Section 5.6.1, we used four six digit NAICS code industries to define the gambling industry.

Since the CBP identifies establishments by employee count in ranges, we can generate upper and lower bound estimates of total employment in each gambling industry NAICS national industry group in Alberta. Table 7.1 shows the upper and lower bound employment estimates for 2008, the most recent year for which CBP data are available. For the indeterminate category of establishments, we treat the lower bound of employees equal to 1 and the upper bound equal to 2. For all other employment ranges, the lower bound is based on the smallest number in the range and the upper bound is based on the largest number. For the category of 500+ employees, the upper bound is arbitrarily set equal to 1,000. This assumption should not have much of an impact on the upper bound employment estimate because only four establishments in the gambling industry in the province, one casino hotel and three casinos, fall into this employment range. Actual employment must lie between these bounds, but, lacking exact employment for each establishment, we cannot calculate actual employment. From Table 7.1, casinos employ the largest number of workers in the gambling industry. The CBP data indicate that, in 2008, the number of employees in casinos lies in the range from 2,775 to 5,837. Establishments in the lottery industry group employed a smaller number of workers, as the estimate lies between 237 and 547 employees for that industry group. Overall, the province had between 4,500 and 9,700 employees in the gambling industry in 2008, based on CBP data.

## **7.2.2 Evidence from the Survey of Employment, Payrolls, and Hours**

The previous section estimated employment from establishment counts for six digit NAICS code national industries that make up the gambling industry, based on establishment counts for specific

Table 7.1: Gambling Industry Employment Estimates, 2008 Lower and Upper Bounds

Industry	Employment Estimate	
	Lower Bound	Upper Bound
Casino	2,775	5,837
Other Gambling Industries	770	1,584
Lotteries	237	547
Casino Hotel	800	1,698
Total	4,582	9,666

employment ranges. While this analysis provides important information about total employment in the gambling industry in the province, and describes the employment impact of the industry, it lacks information about the compensation of employees in the industry and other characteristics of jobs in the gambling industry. In this section, we use another secondary data source to examine employment, earnings and other characteristics of employment in the gambling industry, the Survey of Employment, Payrolls, and Hours. The Survey of Employment, Payrolls, and Hours contains data at the four digit NAICS industry level but not at the six digit level. We analyze data from NAICS code 7132, “Gambling Industries,” that contains all the six digit NAICS national industries above except casino hotels.<sup>1</sup> NAICS industry group 7132 includes the three six digit NAICS national industries analyzed above: “casinos,” “lotteries,” and “other gambling industries.” Casino hotels are listed under a different 4-digit NAICS industry, so we focus only on NAICS industry 7132 here. In addition to total employment, this section also analyzes data on monthly payrolls for employees in the gambling industry and the number of hours worked by hourly employees in the gambling industry.

The data source for this section is the Survey of Employment, Payrolls and Hours conducted by Statistics Canada. The Survey of Employment, Payrolls and Hours is Canada’s primary source of data on total paid employees, payrolls, and hours worked at the industry, province, and territory levels. The data in the survey are collected by Statistics Canada as part of the Business Payroll Survey performed by the Canada Revenue Agency. The data are available monthly beginning in January 1991. In all there are 216 monthly observations for Alberta in our sample period, 1991 to 2009.

We obtained three types of data from the Survey of Employment, Payrolls, and Hours. First, the survey contains employee counts for both hourly and salaried employees. The total number of paid employees is separated into salaried and hourly workers, depending on job characteristics. Second, the survey contains data on nominal weekly earnings for hourly and salaried employees.

<sup>1</sup>Official NAICS description: “This industry group comprises establishments (except casino hotels) primarily engaged in operating gambling facilities, such as casinos, bingo halls, and video gaming terminals, or in the provision of gambling services, such as lotteries and off-track betting.”

We transform that data into monthly earnings and also express the figures in real 2009 dollars. Finally, the survey contains data on the weekly number of hours that hourly gaming employees work in both Alberta and across Canada. All data in the Survey of Employment, Payrolls, and Hours are available at the monthly frequency. We cannot aggregate monthly totals for this survey to higher temporal levels (quarterly, annual) due to double counting.

## Employment

In this section, we develop employment estimates by type of job for the gambling industry in Alberta based on data from the Survey of Employment, Payrolls and Hours. Recall that the gambling industry classification contains three NAICS code national industries: casinos, lotteries, and the “other gambling” national industries. The employment data identify the number of hourly and salaried workers in the gambling industry. In general, the salaried worker classification contains management and skilled jobs and the hourly worker classification contains production workers, cleaning staff, and other less skilled positions. These data do not control for seasonal variation in employment. We focus on employment in Alberta but we also present estimates for all of Canada as a point of reference. In addition to employment, we also analyze monthly percentage changes in employment in both salaried and hourly employment classifications in order to assess volatility of employment in the industry. The volatility of employment reflects net hires and quits in the industry and provides a rough measure of net job creation and job loss in the industry over time as well as the permanence of jobs in the industry.

Note that in order to paint a comprehensive and consistent picture of employment in the gambling industry in Alberta over time we turned to these secondary data sources instead of relying on other data sources like the Alberta Gaming and Liquor Commission (AGLC) records or surveys of casino employees in Alberta. Unfortunately, AGLC does not keep counts of licensed gaming employees by specific job description over time. In addition, one licensed gaming employee can officially be counted in multiple positions in the AGLC records, and therefore it is impossible to get an accurate count of the number of licensed gaming employees in the province at any point in time. While a one-off survey of casino employees could capture significant detail about current employees in a narrow sector of the gambling industry, such a survey would not capture the dynamic nature of employment in the gambling industry, and would not be as comprehensive as data from secondary sources.

Table 7.2 contains basic summary statistics for salaried, hourly, and total gambling industry employment over the period 1991 to 2008. From Table 7.2, the average monthly gambling industry employment in Alberta was almost 3,500 over the period and that number ranged from 2,200 to over 5,000. Monthly salaried worker employment in the gambling industry averaged 701 per month and ranged from 418 to 1,155. Hourly worker employment averaged 2,796 per month and ranged

Table 7.2: Summary Statistics, Gambling Industry Employee Counts

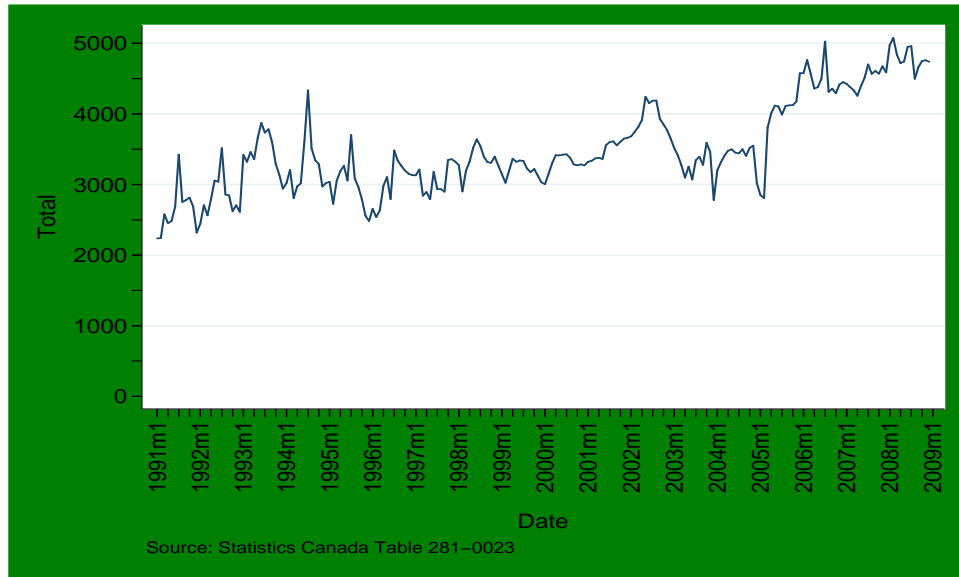
Area	Worker Type	Monthly Employment				Percent of Total in Canada
		Average	Std Dev	Min	Max	
Alberta	Salary	701	176	418	1,155	9.23
Alberta	Hourly	2,796	604	1,775	4,325	11.21
Alberta	Total	3,496	641	2,237	5,077	10.75
Canada	Salary	7,563	1,119	5,211	10,857	—
Canada	Hourly	24,944	6,198	14,115	36,103	—
Canada	Total	32,507	6,746	19,326	44,816	—

from 641 to 2,237. Hourly employees made up almost eighty percent of the total gambling industry employment in Alberta (79.98). This estimate is lower than the estimate from the CBP data above in part because it excludes employment in casino hotels. However, this estimate lies in the range generated from the CBP establishment counts above, so the two are consistent. In each month across Canada, gambling industry employment averaged about 7,600 salaried workers and more than three times that number working on an hourly basis. Overall, roughly 32,500 people are employed in the gambling industry each month across Canada.

Figure 7.1 shows the monthly total employment in the gambling industry in Alberta. Recall that these data are not adjusted for seasonal variation. Despite including seasonal factors that affect employment like variation in consumer demand for gambling and travel, the data show remarkably little seasonal variation. Not seasonally adjusted monthly employment data for an industry with significant seasonal variation, like construction, typically show large, regular peaks and drops in specific months. Construction employment would peak in the summer months every year and drop in the winter months, due to the seasonal nature of construction work. The lack of any detectable seasonal variation on Figure 7.1 means that employment in the gambling industry does not vary much on a month-to-month basis in Alberta. However, Figure 7.1 does show quite a bit of variation in total employment at irregular frequencies, suggesting that the industry may experience high turnover, and that establishments in the industry adjust their total employment by a significant amount at irregular frequencies. We explore this idea further below.

The dominant feature on Figure 7.1 is the general upward trend in the total number of employees in the gambling industry in Alberta over this period. This reflects the increases in the number of establishments in the gambling industry documented in Section 5.6.2. It also reflects growth in casinos and other businesses in the NAICS gambling industry. A careful examination of Figure 7.1 reveals three distinct periods of change in total employment in the gambling industry in Alberta. The first features a long period of relatively slow growth from the beginning of the period in the early 1990s to sometime in 2002, when total employment abruptly increased for several months. The second period features a decline in total employment from mid 2002 until early 2004. The

Figure 7.1: Total Gambling Employees in Alberta



third features another prolonged period of growth in monthly employment, this one faster than the earlier period of growth, beginning in in early 2005 and continuing through 2009. This second period of increase in employment persisted through the rest of the sample period. The second increase in employment cannot be attributed to an increase in the number of establishments as Table 5.13 shows a decreasing trend in the number of gambling establishments in the province over this period. The other possible explanation is firms in the gambling industry hiring more workers and expanding their operations at that time. In addition, employment within each period shows significant irregular variation around these trends, suggesting that employees in the gambling industry turn over frequently, whether because of quits or lay offs, and establishments frequently hire or lay off relatively large numbers of employees. This high volatility suggests that employment in the gambling industry comes with risks of lay off, and that workers in this industry enter and leave employment in the industry, and potentially enter and leave the labour force, relatively frequently.

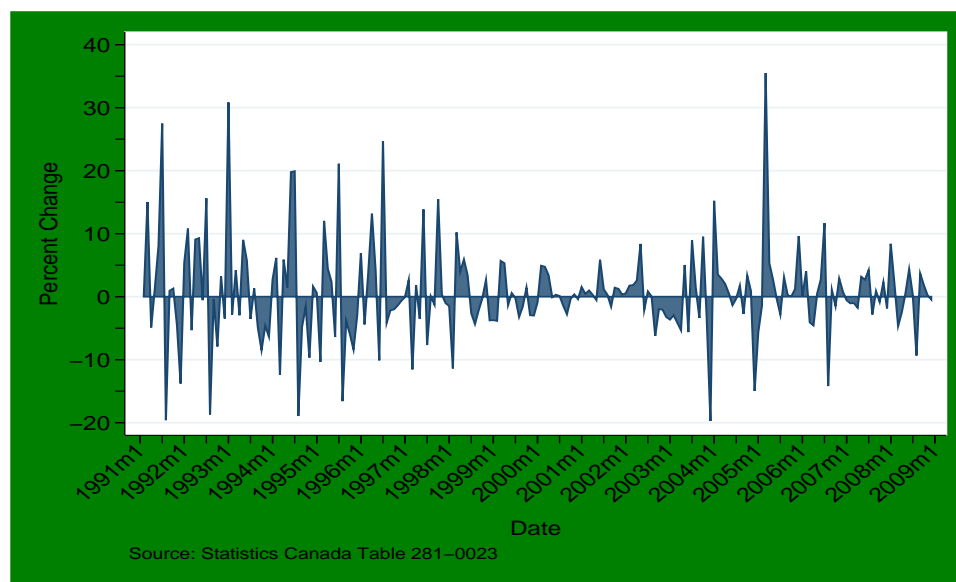
Given this possibility, two additional questions emerge about the nature of employment in the gambling industry in Alberta. These questions relate to net job creation and destruction in the gambling industry in the province. First, how volatile is monthly employment in the gambling industry and how does the volatility of employment in the gambling industry in Alberta compare to the volatility in the rest of Canada? Second, does variability of employment differ for salaried and hourly jobs?

Figure 7.2 shows the monthly percentage change in total employment in the gambling industry in Alberta over the period 1991 to 2009. The monthly percentage change in employment is a measure of the volatility of employment in the industry, and reflects the relative magnitudes of new hires



and terminations (workers who are fired or laid off, quit their job, retire, or go on disability during the month). It reflects net flows of workers into the industry and out of the industry each month, and thus also reflects relative turnover of employment in the industry in terms of job creation and destruction.

Figure 7.2: Monthly Percent Change in Employment, Gambling Industry in Alberta

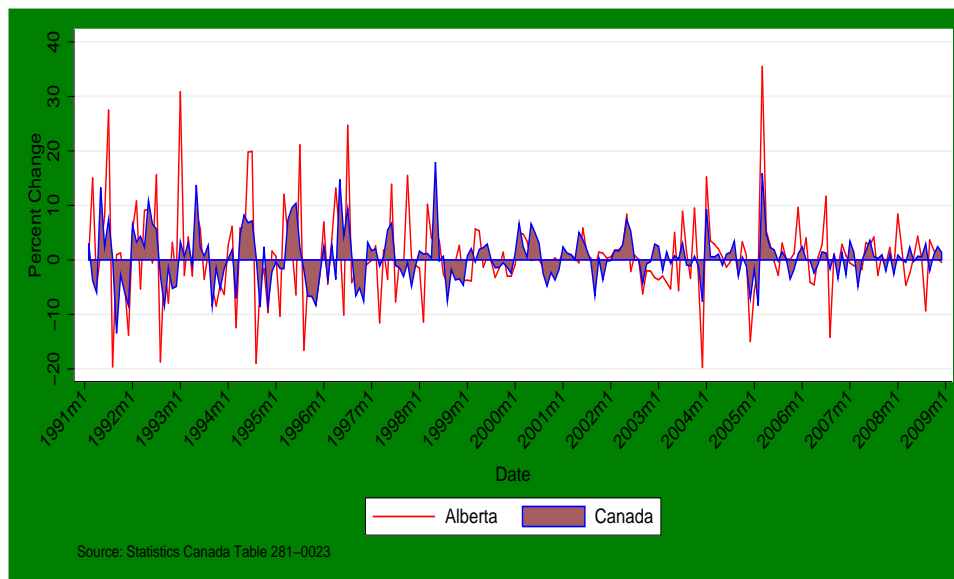


From Figure 7.2, notice the high volatility of employment in the gambling industry in the 1990s. This indicates that turnover in jobs in the gambling industry in the province in the 1990s was high. Many workers were entering and leaving employment in the industry each month. Again, some of this variation may be due to seasonal factors, since the data are not seasonally adjusted. For example, horse racing takes place in certain months, and tourism is higher in summer months. However, the volatility declines in the middle period of the sample. Just because a visual inspection of the data does not reveal seasonal variation does not mean it isn't present in the data. Some volatility returns to total employment in the gambling industry in Alberta beginning in early 2003. March 2005 represented the largest percentage change increase in employment in the gambling industry in Alberta, with over a 35 percent increase. December 2003 saw the highest monthly decrease in employment in the gambling industry in Alberta at just under a 20 percent decline from November 2003.

Do gambling industry employees in all of Canada experience similar volatility in employment as employees in the gambling industry in Alberta? Figure 7.3 shows the monthly percentage change in employment for all total employment in the gambling industry in both Alberta and Canada during the sample period. The red line represents data from Figure 7.2, monthly percentage change in total employment in the gambling industry in Alberta, and the blue shaded area represents the monthly percent change for all gambling employees in Canada. From Figure 7.3, notice that the gambling

industry in Alberta features higher volatility, based on the average monthly percent change in total employment in the industry, than the gambling industry in all of Canada. Employment in the gambling industry in Alberta features relatively higher turnover than employment in the gambling industry in other provinces.

Figure 7.3: Comparison of Volatility of Employment: Alberta and Canada



In summary, the variability of total employment in the gambling industry in Alberta is high compared to the rest of Canada. This is what one may expect considering one is comparing a province to the rest of the country. However, there are instances where it appears that the volatility is higher across the rest of the country compared to Alberta. Examining the late 1990s and early 2000s, it appears that there is greater volatility throughout Canada compared to Alberta. In addition, even though the number of establishments in the gambling industry decreased over the past eight years in Alberta, a general increase occurred in the number of employees in the industry after 1991. The province also experienced high volatility in total employment in the gambling industry from month to month in the 1990s and after early 2003. The overall volatility of total employment in the gambling industry in Canada remained relatively constant over this period.

What about the volatility of employment for hourly and salaried workers in the gambling industry? The following figures address the second question raised above: do establishments in the gambling industry hire more salaried workers or hourly employees, and does variability of employment differ for these two types of worker? An examination of the time series plot of total employment of salary and hourly workers shows similar patterns to those on Figure 7.1 above, in that there is little regular seasonal variation, significant irregular variation, and similar trends over time, so we do not reproduce that graph.

The composition of employment in the gambling industry in Alberta was 80% hourly workers and 20% salaried workers over the sample period. This is to be expected. Salaried workers are typically managers or other white collar positions like accountants, while hourly workers tend to be regular employees. In the next section we document the differences in compensation of hourly and salaried workers. Here we focus only on the relative volatility of total employment in these two types of jobs in the gambling industry in Alberta.

Figure 7.4: Comparison of Salaried and Hourly Employment Volatility in Alberta

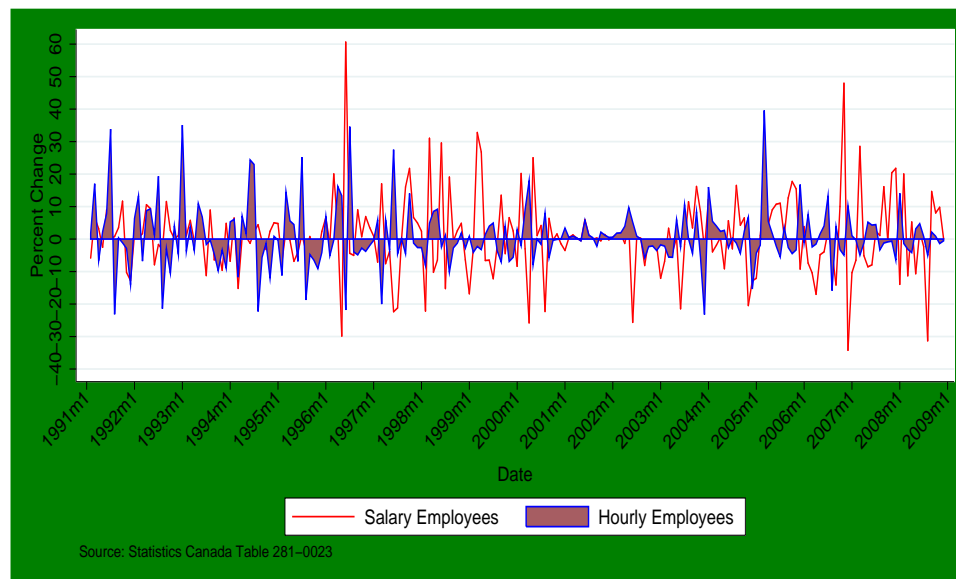


Figure 7.4 shows the volatility of total salaried employment in the gaming industry and the volatility of total hourly employment in the gaming industry in Alberta, as measured by the percentage change in monthly total employment for each employment type in the gambling industry in Alberta. Figure 7.4 shows an interesting pattern in the relative volatility. Early in the period, until roughly 2001, the volatility of employment of hourly workers was higher than the volatility of employment of salaried workers. In the early part of the period there was relatively more turnover in hourly employment in the gambling industry in Alberta. However, the relative volatility changed after 2001, when the volatility of salaried worker employment increased and the volatility of hourly worker employment decreased in the gambling industry in the province. Since the early part of the decade, turnover in salaried worker employment has been larger in the industry. The relative magnitudes of new hires and terminations (workers who are fired or laid off, quit their job, retire, or go on disability during the month) in among salaried workers in the gambling industry is more variable than the magnitudes of new hires and terminations among hourly workers.

Several factors might explain this change. Terminations depend on factors like the average age of employees in that category and the attractiveness of other jobs available to employees the that category. If better outside employment opportunities became available for salaried workers in the

gambling industry later in the period, then turnover might increase relative to hourly workers. Such opportunities could arise in a booming economy like Alberta in the later part of the 2000s. Second, the gambling industry was maturing in the 2000s, and as the tenure of salaried employees increases, the number of retirements will also increase, leading to greater turnover in employment.

## Wages and Hours

Also included in the Survey of Employment, Payrolls, and Hours are data on the average wages of both hourly and salaried workers. These data provide information on compensation of employees; how much money is paid to hourly and salary workers on average. In addition, the Survey of Employment, Payrolls, and Hours contains data on the number of average hours worked per week by hourly gaming employees. Understanding the compensation of employees in the gambling industry in Alberta is important because compensation determines the quality of the jobs in the industry.

Table 7.3: Summary Statistics, Average Monthly Earnings

Area	Industry	Employee Type	Estimated Mean	
			Monthly Earnings	Std. Dev.
Alberta	Gambling Industry	Hourly	\$1,070	167
Alberta	All Industries	Hourly	\$2,267	183
Canada	Gambling Industry	Hourly	\$1,767	152
Canada	All Industries	Hourly	\$2,288	52
Alberta	Gambling Industry	Salary	\$3,157	410
Alberta	All Industries	Salary	\$4,119	296
Canada	Gambling Industry	Salary	\$4,177	240
Canada	All Industries	Salary	\$3,999	135

Table 7.3 shows average monthly earnings (in 2008 dollars) of salaried and hourly employees in Canada and the province in Alberta from 1991 through 2008 for employees in the gambling industry as well as average values for employees in all industries in Alberta and across Canada. In Alberta, hourly employees in the gambling industry earn about a thousand dollars per month. This is significantly less than the average monthly earnings of all hourly employees in the province, the difference is more than \$1,000 per month, and probably explains why gambling industry jobs turn over rapidly in Alberta - many more attractive options exist in the provincial labour market. The gap between monthly earnings of employees in the gambling industry in the rest of Canada is just over \$500, a relatively large gap. In general, hourly jobs in the casino industry pay less than hourly jobs on average in Alberta and in Canada. The same relationship holds for salaried workers in the gambling industry. Average monthly earnings for salaried workers in the gambling industry in Alberta are \$3,157 while the overall average monthly earnings in the province for salaried workers is \$2,277, a difference of \$962 per month. For all of Canada, salaried workers in the gambling

industry earn more than salaried workers in all industries, suggesting that salaried workers in the gambling industry in Alberta earn less in both relative and absolute terms compared to the rest of the country.

These differences in average monthly earnings mean that jobs in the gambling industry are relatively low paying in Alberta, relative to the average level of compensation in the province. This difference exists for both salaried workers and hourly workers in the gambling industry. The difference in earnings means that existing workers in the gambling industry could have more lucrative opportunities in other sectors of the economy, if they have the required skill and live in the area where job openings take place. However, this difference does not mean that the jobs in the gambling industry are worse than other jobs. There could be significant variation in average monthly earnings across regions of the province that would make a gambling industry job in, say, Lethbridge attractive to someone living there, relative to other employment opportunities in Lethbridge.

Table 7.4: Summary Statistics, Monthly Payroll, Gaming Industry

Area	Employee type	Mean	Std. Dev.	% of Country
Alberta	Salary	\$2,194,000	559	6.97
Alberta	Hourly	\$3,010,000	925	6.73
Alberta	All	\$5,204,000	1,146	6.83
Canada	Salary	\$31,500,000	4,496	—
Canada	Hourly	\$44,700,000	13,600	—
Canada	All	\$76,200,000	16,300	—

Table 7.4 estimates the total monthly payroll for firms in the gaming industry for 1991 through 2008. This estimate involved multiplying average monthly earnings by the total number of workers in that class in each month. The figures are expressed in 2008 dollars. Total average monthly payroll for employees within the gambling industry (NAICS code: 7132) was \$5.2 million during the sample period. On average, firms in the gambling industry in Alberta pay \$62,448,000 a year to employees. Alberta composes less than 7 percent of the country's payroll to gambling employees.

Table 7.5: Summary Statistics, Hourly Gaming Employees

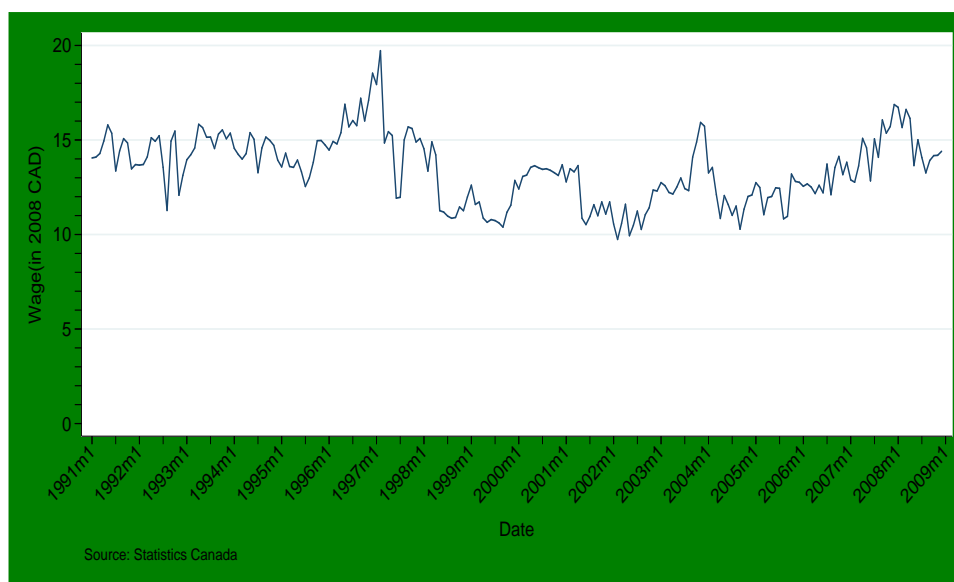
Area	Variable	Mean	Std Dev	Min	Max
Alberta	Hourly Wage (in 2008 \$)	13.47	1.80	9.74	19.73
Canada	Hourly Wage (in 2008 \$)	17.27	1.44	12.93	20.18
Alberta	Hours worked per month	80	10.48	59	110
Canada	Hours worked per month	103	14.61	73	133

Table 7.5 presents summary statistics for hourly gaming employees. In Alberta, the average hourly wage (in 2008 dollars) for an hourly gaming employee was \$13.47 from the sample period.

The average hourly wage across Canada was \$17.27. In Alberta, the average hours worked per month by hourly employees was 80 (20 hours per week) and for Canada it was 103 (approx 26 hours per week).

It is clearly important to understand the underlying characteristics of jobs held by hourly workers in the gambling industry in Alberta since they compose, on average, 80 percent of the employees in the gambling industry. Figure 7.5 shows the average real hourly wage and Figure 7.6 shows the number of hours worked per month for gambling industry employees in Alberta.

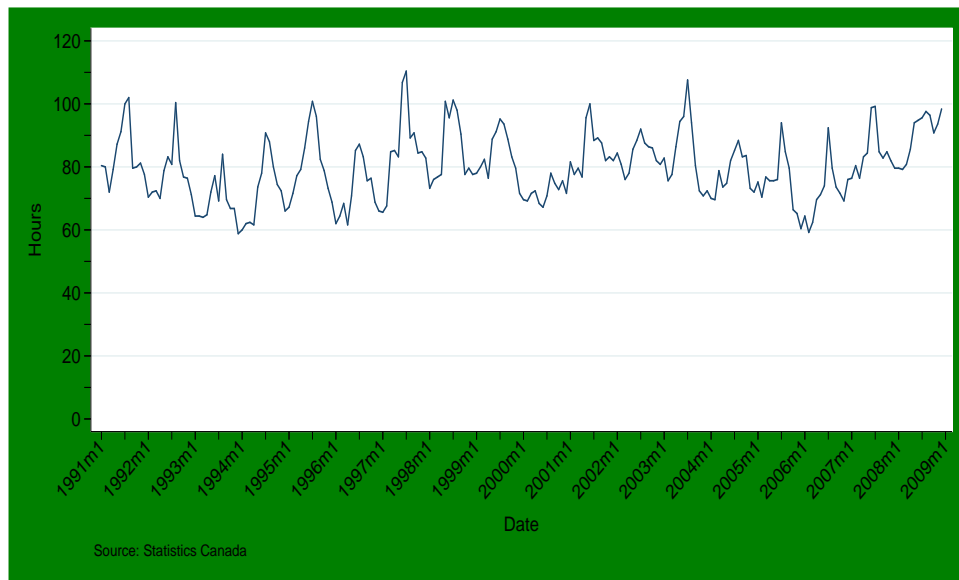
Figure 7.5: Real Hourly Wage of Hourly Gaming Employees



From Figure 7.5, from 1991 until 1997, real hourly wages increased slightly; hourly wages in the gambling industry rose at about the same rate as prices during this period, as the graph is relatively flat. From 1997 until 2001 the real hourly wage declined steadily. During this period, wage increases were not keeping up with the rate of inflation in the province. From about 2001 on, real average wages in the gambling industry in Alberta increased, reaching about \$15 per hour, a rate of compensation not seen in the gambling industry in inflation adjusted terms since the late 1990s.

From Figure 7.6, monthly hours worked by hourly gaming employees in Alberta has remained relatively constant throughout the entire sample period. Seasonal variation is clearly present in this graph. Information on this figure and the information on Figure 7.1 on total employment clearly shows that firms in the gambling industry use overtime and extra shifts, rather than new hiring and layoffs, to meet seasonal variation in demand for gambling activities by consumers. Employment shows no seasonal variation, but hours worked shows significant seasonal variation, so the existing workers must work more hours in some months than in others. Since 2006, the number of hours

Figure 7.6: Monthly Hours Worked for Gambling Employees



worked in a month has increased. Recall in Figure 7.5 that the hourly wage has increased since 2006. As a result it looks like employees are working more hours each month but are being compensated more. The difference can be explained by patterns in hours worked.

## Payroll

This section examines the total amount of money paid to all gaming employees in the province, based on data from the Survey of Employment, Payrolls, and Hours. The total payroll is an indicator of the overall impact of employment in the gambling industry on Alberta's economy. Total payroll provides a ready measure of the aggregate number of dollars put into the pocket of employees in the gambling industry in the province. These dollars get spent on consumer goods (housing, food, transportation, and other goods and services purchased by families in Alberta) so total payroll is also an indication of the effect of the gambling industry on other industries in the province. The total payroll also provides a rough assessment of the impact of the gambling industry on taxes, since total payroll also reflects total income earned by employees in the gambling industry in the province. Since double counting is not a factor for payroll data, we develop annual estimates of total payroll in the gambling industry in the province. All of the dollar values below are expressed in thousands of 2008 dollars.

Table 7.6 contains estimates of total payroll in the gambling industry in Canada and in Alberta over the the period 1991-2008. From Table 7.6, the total payroll in the gambling industry in Alberta almost doubled from 1991 to 2008 in inflation adjusted terms. Since real wages were

Table 7.6: Total Payroll, Gambling Industry (2008 dollars)

Year	Alberta Payroll	Canada Payroll	% of Alberta to total Canada
1991	\$49,358,000	\$621,671,000	7.94
1992	\$49,773,000	\$664,141,000	7.49
1993	\$58,749,000	\$674,612,000	8.71
1994	\$54,641,000	\$736,553,000	7.42
1995	\$52,061,000	\$777,808,000	6.69
1996	\$56,456,000	\$793,365,000	7.12
1997	\$61,146,000	\$812,058,000	7.53
1998	\$55,949,000	\$835,159,000	6.70
1999	\$56,111,000	\$838,302,000	6.69
2000	\$57,156,000	\$902,271,000	6.33
2001	\$64,342,000	\$994,695,000	6.47
2002	\$65,327,000	\$1,008,633,000	6.48
2003	\$59,739,000	\$1,088,486,000	5.49
2004	\$57,616,000	\$1,103,921,000	5.22
2005	\$67,025,000	\$1,124,223,000	5.96
2006	\$77,184,000	\$1,128,990,000	6.84
2007	\$84,092,000	\$1,153,992,000	7.29
2008	\$97,355,000	\$1,206,779,000	8.07
Mean	\$62,449,000	\$914,759,000	6.91
Std Dev.	12,438,000	189,109,000	0.89
Min	\$49,358,000	\$621,671,000	5.22
Max	\$97,355,000	\$1,206,779,000	8.71
Median	\$58,183,000	\$870,287,000	6.77

relatively flat, much of this increase represents new employment in the industry, and not increased earnings by existing workers. However, gambling expanded across the country as evidenced by the fact that Alberta's share of overall gambling payroll increased only slightly over that time period. The mean yearly payroll for Alberta during the sample was \$62,449,000, and Alberta's payment to gambling employees accounted for just less than 7 percent of Canada's overall payments to gambling employees.

### Alberta Compared to Other Provinces

Using the data described above, we can also compare the gambling industry in Alberta to the gambling industry in other provinces in Canada. We only have access to comparable data from the provinces of Quebec, Ontario, Alberta, British Columbia, and Saskatchewan. However, Saskatchewan must be eliminated from the analysis because many of the months of data from that province are



suppressed due to the requirements of the Statistics Act.<sup>2</sup> Therefore, the comparison will be between Alberta and Quebec, Ontario, and British Columbia. The time period remains 1991-2008. Table 7.7 presents summary statistics for the gambling industries in these provinces in terms of total monthly payroll for gambling employees (in thousands of 2008 dollars), the number of salary, hourly, and total gambling employees, and the hourly wage. Note that these figures apply to casino and bingo hall employees only.

Table 7.7: Summary Statistics, Gambling Industry Employees by Province

Variable	Obs	Mean	Std. Dev.	Min	Max	Median
Alberta						
Total Monthly Payroll ('000s)	216	5,204	1,146	3,372	8,794	4,949
Number of Salary Employees	216	701	176	418	1,155	673
Number of Hourly Employees	216	2,796	604	1,775	4,325	2,635
Total Gambling Employees	216	3,496	641	2,237	5,077	3,359
Hourly Wage	216	13.47	1.80	9.74	19.73	13.55
British Columbia						
Total Monthly Payroll ('000s)	216	7,954	1,998	4,879	15,187	7,414
Number of Salary Employees	216	931	229	489	2,005	880
Number of Hourly Employees	216	3,079	1,195	1,672	5,837	2,542
Total Gambling Employees	216	4,009.12	1,317	2,433	7,029	3,482
Hourly Wage	216	18.06	2.90	11.81	24.93	17.92
Ontario						
Total Monthly Payroll ('000s)	216	41,884	8,943	22,964	58,435	42,539
Number of Salary Employees	216	3,796	758	2,201	7,069	4,011
Number of Hourly Employees	216	12,099	2,853	6,681	16,908	12,331
Total Gambling Employees	216	15,895	3,325	8,988	20,958	16,151
Hourly Wage	216	17.87	2.74	11.25	24.10	17.97
Quebec						
Total Monthly Payroll ('000s)	215	12,373	4,307	5,404	19,767	12,001
Number of Salary Employees	215	958	233	415	1,664	983
Number of Hourly Employees	215	3,617	1,512	1,396	6,122	3,154
Total Gambling Employees	215	4,574	1,628	2,028	7,229	4,123
Hourly Wage	215	20.53	2.64	14.32	31.32	20.41

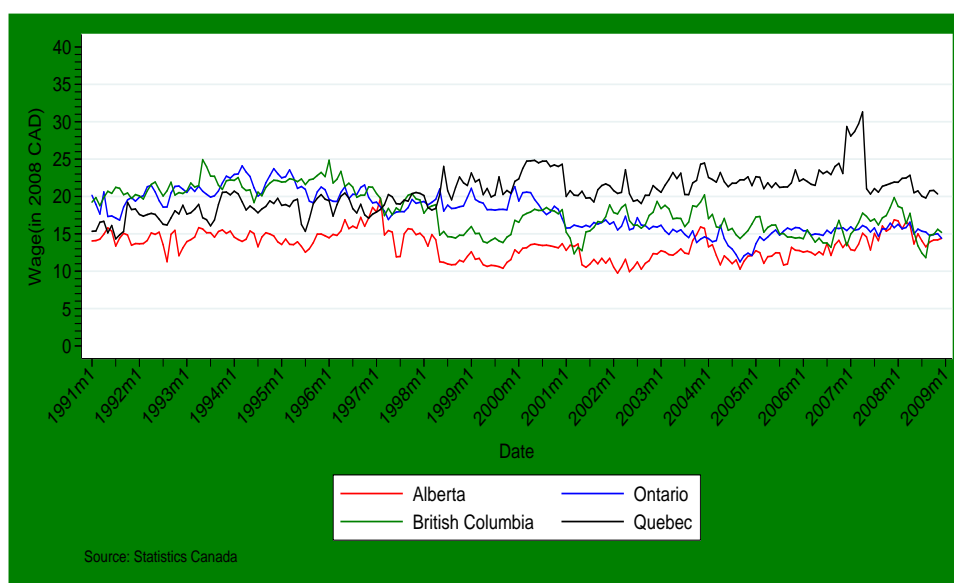
Table 7.7 highlights the differences across the four provinces in terms of the mean payroll and the total number of gambling employees in the industry. The interesting observation from this table is the disparity in the hourly wage amongst the provinces. Alberta has the lowest mean hourly wage (\$13.47) for gambling employees during the time period with Quebec having the highest hourly wage at \$20.53 dollars. Hourly gambling industry employees earn significantly less than

<sup>2</sup>The data for Quebec for the month of December in 2008 was unavailable at the time of analysis.

similar employees in the other three provinces. This could reflect differences in the cost of living across these four provinces, compensating differentials driven by differences in taxes, or a lack of competition for gambling industry jobs in Alberta.

To investigate this further, we examined changes in real hourly wages in all provinces over this period. Figure 7.7 presents a comparison of the average hourly wage for hourly gaming employees in each province. Hourly wages are expressed in real 2008 dollars. From Figure 7.7 one sees that historically Alberta is the lowest in terms of hourly wages paid to employees in the gambling industry. Quebec currently has the highest hourly wage for gambling employees.

Figure 7.7: Comparison of Hourly Wage Amongst Provinces



## 7.3 Gambling Industry Employment Dynamics

### 7.3.1 Evidence from the Labour Force Survey

The third data source used to examine gambling's impact on employment is the Labour Force Survey (LFS). According to Statistics Canada, "the main objective of the LFS is to divide the working-age population into three mutually exclusive classifications - employed, unemployed, and not in the labour force - and to provide descriptive and explanatory data on each of these."<sup>3</sup> The LFS is a large scale, nationally representative, monthly survey of labour force conditions used to generate monthly estimates of economic conditions. The target population is people aged 15 years

<sup>3</sup><http://www.statcan.gc.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=3701&linebreak&lang=en&db=imdb&adm=8&dis=2>.

and older. The LFS contains detailed data about the labor force status of Canadians, demographic characteristics of workers, and characteristics of the jobs they hold.

The basic unit of observation in the Labour Force Survey data is a person-month. Each participant in the LFS is contacted monthly for a six month period. At the end of six months, survey participants are replaced with another participant according to a sampling procedure. Since 1995, the LFS sample size has been approximately 54,000 people each month. We exploit the fact that the LFS contains a large number of people and tracks them monthly for six months to understand the dynamics of employment in the gambling industry in Alberta over time. Because of the large sample size, and long sample period in the LFS, we observe a relatively large number of individuals who are employed in the gambling industry in Alberta for only part of the six months they appear in the LFS. We observe both individuals who begin employment in the gambling industry while in the LFS, and individuals who leave employment in the gambling industry while in the LFS. We also have data on the characteristics of the other jobs, and the labour force status of these individuals who transition in and out of employment in the gambling industry in Alberta. This provides powerful and interesting insight into the dynamics of employment in the gambling industry in Alberta over a relatively long period of time.

The LFS contains detailed data on occupation and industry of employment for each survey participant. The LFS employs two different job classification systems. The first, 4-digit NAICS codes, were explained above in Section 7.2.1 on page 118. The second system, the National Occupation Classification for Statistics (NOC-S), was developed by Statistics Canada and represents a taxonomy of occupations in the Canadian labour force. The NOC-S describes 923 different occupations in terms of the aptitude, interests, and educational background of workers employed in these occupations and the physical requirements of the occupations (Statistics Canada, 2006).

The NOC-S classification system is different than the NAICS. The NAICS codes identify industries, while the NOC-S identifies occupations that are similar across different industries. The NOC-S would allow us to examine employment in the gambling industry from a different perspective than the analysis above, but it also presents some problems. The biggest problem is that the gambling industry NAICS classification is not comparable to the NOC-S at the national industry level. In the NOC-S classification system, the only gambling industry occupation identifies is casino employees. As a result, we do not use data on employment using the NOC-S system and focus on the NAICS classification system employment data in this report.

Statistics Canada produces a public-use data micro data file for the Labour Force Survey. However, in order to track individuals' employment, entry, and exit into jobs in the gambling industry, we required access to the confidential Labour Force Survey micro data files. This entailed an application and peer-review of the proposed research, which was granted in late 2009. All work was performed on secure servers at the Research Data Centre on the University of Alberta campus. We have access to the LFS confidential monthly micro data files for the period 1977 through 2009.

According to the *Guide to the Labour Force Survey Manual* produced by Statistics Canada (2010), the sampling procedure in the LFS proceeds as follows. Throughout the provinces, there are a number of economic regions. Within the economic regions are strata. Within the strata are clusters which are a collection of approximately 200 households. The cluster is the basic unit of stratification. A sample of clusters is selected in each stratum. “All dwellings within selected clusters are listed and a sample of dwellings is chosen from each list” (Statistics Canada, 2010, p. 20).

According to Statistics Canada (2010), beginning in July 1995 the LFS sample size was about 54,000 households in each month. Participants are in the survey for six consecutive months and are asked questions related to employment, job status, earnings, and reasons for unemployment. We are only able to examine the data at the provincial level since we do not have specific person-month characteristics at smaller geographic levels such as census division, census subdivision, or census metropolitan area. In order to examine individual workers, we had to devise a unique identifier in the LFS data. The confidential data does not contain a person identifier due to both the Statistics Act and the fact that the survey sampling is based on households, not individuals. As a result, a unique person identifier for individuals in the LFS is difficult to construct. After considerable work, we were able to construct an individual identification variable that identifies individuals throughout their six months in the Labour Force Survey. The identifier is based on detailed information about the geographic and demographic characteristics for each individual in the LFS.

### **Gambling Industry Employment from the Labour Force Survey**

We analyzed data from the Labour Force Survey over the period 1996 through 2009.<sup>4</sup> We limit our analysis to this period because of the size of the LFS confidential micro data files, which are hundreds of megabytes for each survey year. We identify LFS participants who worked at least one month in the gambling industry in Alberta over this period. Table 7.8 shows the weighted count of the total gambling workers in Alberta by month and year from the LFS, an estimate of total employment in the industry. It also contains confidence intervals for the weighted total employment.

From Table 7.8, total monthly employment was between 1,081 and 2,699 workers in the gambling industry in Alberta. The estimates indicate that employment in the gambling industry grew steadily and constantly over the period 1997 to 2009. In 2009, the estimated employment in the gambling industry in Alberta from the LFS was between 2,062 and 3,277 workers. The estimated total employment per year in the province was roughly 1,800 on average from 1997 to 2009. Notice that this estimate is somewhat lower than the ones reported earlier in this chapter, based on data from

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<sup>4</sup>While the research and analysis are based on data from Statistics Canada, the opinions expressed here do not represent the views of Statistics Canada.

Table 7.8: Gambling Industry Employment Estimates, LFS

Year	Total	std. err.	95% CI Lower	95% CI Upper
1997	1081	194	700	1461
1998	1238	191	863	1614
1999	1623	216	1199	2047
2000	2049	242	1573	2525
2001	2197	254	1699	2695
2002	1627	220	1196	2059
2003	1723	217	1297	2148
2004	1997	234	1538	2456
2005	1779	232	1324	2233
2006	1970	252	1475	2465
2007	2251	273	1715	2786
2008	2195	262	1681	2709
2009	2669	309	2062	3277

CBP and the Survey of Employment, Payrolls, and Hours. The CBP estimate was between 4,500 and 9,600 employees per year; the estimate from the Survey of Employment, Payrolls, and Hours was between 2,200 and 5,000. One explanation for the difference in estimated total employment from the LFS is the high turnover of gambling employees discussed above — see Table 7.1. Recall from Figure 7.2 that the turnover in employment in the gambling industry appears to be very high. However, the secondary data sets used above only capture net monthly changes in employment, and do not contain information on individual employees, they are only reflect turnover in positions. Since the LFS contains information on individual workers, and not information on jobs at establishments, we get a different picture of the number of employees in the gambling industry from the LFS. As a result of this difference in the unit of observation, the estimated total employment is lower than estimates from other data sources reported in this chapter.

What are the characteristics of individuals who work in the gambling industry in Alberta? The average age and gender of gambling industry employees appears on Table 7.9. The average age of a worker in the gambling industry in Alberta was 38 years. Table 7.9 shows that the average age ranges from 30 years old to almost 40 years old. Over the past few years the average age of gambling industry employees increased. Table 7.9 presents the gender breakdown of gambling employees from 1996 through 2009. Notice in Table 7.9 shows that more females were employed in the gambling industry than males over the sample time period. However, in 2009 was the first time that more males were employed within the gambling industry.

Table 7.9: Average Age and Gender of Gambling Industry Employees in Alberta

Year	Age	Std. Err.	95% CI LB	95% CI UB	% Male	% Female
1996	32.8	3.9	25.1	40.5	0.357	0.643
1997	33.9	2.8	28.4	39.4	0.482	0.518
1998	30.4	2.0	26.5	34.3	0.386	0.614
1999	30.9	1.8	27.5	34.4	0.316	0.684
2000	32.4	1.6	29.2	35.5	0.413	0.587
2001	33.8	1.7	30.5	37.2	0.350	0.650
2002	33.0	2.2	29.6	38.3	0.360	0.640
2003	36.7	2.4	31.9	41.5	0.363	0.637
2004	35.4	1.0	31.5	39.3	0.313	0.687
2005	37.5	1.8	33.9	41.2	0.439	0.561
2006	38.3	1.0	34.5	42.2	0.439	0.561
2007	36.8	1.8	33.1	40.4	0.474	0.526
2008	39.2	1.9	35.4	42.0	0.496	0.504
2009	36.8	1.9	33.1	40.4	0.525	0.475

### Workers Entering and Leaving Gambling Industry

The LFS allows us to examine detailed characteristics of individuals who enter and leave the gambling industry while participating in the LFS, as well characteristics of their jobs. For the purposes of this report we focus on three specific elements of these labour force dynamics. First, what jobs did people have before and after leaving the industry and what is the difference in the hourly wage before and after the gambling industry jobs.

In the LFS survey, participants are in the survey for six consecutive months. This allows us to track the movement of workers from one industry to another. Since we know the NAICS code industry of employment for LFS participants in each month, we are able to identify when people enter or leave the gambling industry, their labour force status before and after, and where they worked before and after. Table 7.10 lists the most common industries where people taking jobs in the gambling industry were employed before entering the industry, and the most common industries where people who leave the gambling industry take new jobs. Due to the requirements of Statistics Act, we are not able to show the frequencies due to not meeting the required minimum number of observations in unweighted samples for the release of results from the confidential LFS micro data files.

From Table 7.10, workers moving into the gambling industry previously worked in a wide range of industries. In general, the most frequent previous industries of employment include construction, retail, food services, education and mining and gas extraction industries. Jobs in the construction industry made up 9% of provincial employment in 2006, the second most common occupation after

Table 7.10: NAICS Industry Codes of Workers Entering and Leaving the Gambling Industry

Entering Gambling Industry		Leaving Gambling Industry	
NAICS Code	Description	NAICS Code	Description
2382	Building Equipment Contractors	4453	Beer, Wine and Liquor Stores
2383	Building Finishing Contractors	5614	Business Support Services
4521	Department Stores	4521	Department Stores
6111	Elementary and Secondary Schools	7224	Drinking Places (Alcoholic Beverages)
7221	Full-Service Restaurants	5613	Employment Services
4451	Grocery Stores	7221	Full-Service Restaurants
7222	Limited-Service Eating Places	4451	Grocery Stores
2361	Residential Building Construction	7222	Limited-Service Eating Places
5617	Services to Buildings and Dwellings	6215	Medical and Diagnostic Laboratories
7223	Special Food Services	6212	Offices of Dentists
2131	Support Activities for Mining and Oil and Gas Extraction	6213	Offices of Other Health Practitioners
		6211	Offices of Physicians
		7139	Other Amusement and Recreation Industries
		4529	Other General Merchandise Stores
		2389	Other Specialty Trade Contractors
		7111	Performing Arts Companies
		7212	RV (Recreational Vehicle) Parks and Recreational Camps
		7112	Spectator Sports
		7211	Traveler Accommodation

Source: Authors' calculations, based on confidential LFS data

retail trade, which accounted for 11% of the jobs in the province in 2006. Accommodation and food service industry jobs accounted for 7% of the jobs in the province in 2006, and was also a common industry of previous employment for workers entering the casino industry. Mining and gas extraction industry jobs also accounted for 7% of the jobs in the province in 2006, and this industry was also a common industry of previous employment for workers entering the casino industry. Only health care appears under-represented in the list of industries where new entrants to employment in the gambling industry previously worked. In 2006 the health care industry accounted for 9% of the jobs in the province, but relatively few entrants into the gambling industry previously worked in this industry. The reason may be differences in compensation between jobs in these two industries, if health care industry jobs pay higher wages on average. Overall, it does not appear that new entrants to jobs in the gambling industry come from any specific previous industry of employment.

The same can be said for people leaving the gambling industry. The industries on the right panel of Table 7.10 include many of the most common in the province in terms of the fraction of



provincial employment accounted for. Two differences can be seen. First, a number of subindustries in the health care industry appear as common new industries of employment for workers who leave the gambling industry for other jobs. Again, this probably reflects a relative difference in average compensation in the health care industry relative to the gambling industry. Second, a number of the subindustries listed on the right panel of Table 7.10 are in the entertainment and recreation NAICS code industry, which is the one that also contains the gambling industry. NAICS industry 71, “Arts, entertainment and recreation” accounted for only 2% of the jobs in the province in 2006, but appears as a frequent industry where workers leaving the gambling industry find new jobs. One reason for this could be that when people leave the gambling industry, they want to stay in the leisure and recreation field but do not like some aspect of working in the gambling industry.

When people enter and leave the industry, how does job change affect their hourly wage? From the LFS, we have data on the hourly wages of the workers for each month they are in the survey. From this, we calculated the hourly wage differential for workers who entered and left the gambling industry by subtracting the reported hourly wage in the first month in the new job from the hourly wage reported in the last month of the old job. A positive differential means that the person is making more money in the new job and a negative number means that a person earned a higher hourly wage in the previous job. Tables 7.11 and 7.12 summarize the mean hourly wage differential for workers entering the gambling industry and leaving the gambling industry respectively.

Table 7.11: Hourly Wage Differential for Workers Entering the Gambling Industry Industry

Year	Mean Wage Difference	Std Err	95 % Interval LB	95% Interval UB
1997	-5.30	2.79	-10.81	0.20
1998	-7.28	4.67	-16.51	1.95
1999	-1.44	1.16	-3.75	0.86
2000	-2.72	1.36	-5.41	-0.04
2001	0.61	2.26	-3.86	5.07
2002	3.04	0.00	—	—
2003	-8.67	2.84	-14.28	-3.06
2004	-2.68	2.91	-8.43	3.08
2005	-2.59	2.18	-6.90	1.73
2006	-4.33	2.92	-10.10	1.44
2007	-5.09	2.46	-9.95	-0.24
2008	-0.29	1.72	-3.69	3.10
2009	-1.35	1.57	-4.45	1.75

Notice from Table 7.11 that people entering the gambling industry earned less per hour in only two years, 2000 and 2007. In all other years, zero lies in the 95% confidence region for the hourly wage differential, suggesting no detectable statistical difference between the hourly wage at the old job and the hourly wage in the gambling industry. Even in the two years where zero does not lie



in the 95% confidence interval, the upper bound is close to zero, suggesting that the difference in wages was not substantial. This means that people entering the gambling industry made about the same hourly wage as they earned in their previous job. One reason for moving to the gambling industry could be the nonmonetary characteristics of jobs in the gambling industry are better. This could include working hours, location, working conditions, and the nature of the jobs.

Table 7.12: Hourly Wage Differential for Workers Leaving the Gambling Industry

Year	Mean Hourly Wage Difference	Std Err	95 % Interval LB	95% Interval UB
1997	1.27	0.81	-0.32	2.87
1998	5.45	0.00	—	—
1999	1.72	0.98	-0.22	3.66
2000	3.99	2.31	-0.58	8.57
2001	6.85	1.97	2.96	10.73
2002	1.66	1.68	-1.67	4.98
2003	-1.84	0.90	-3.62	-0.06
2004	1.79	4.28	-6.67	10.25
2005	4.23	1.42	1.43	7.03
2006	2.34	2.90	-3.40	8.07
2007	5.84	2.98	-0.05	11.73
2008	5.45	1.44	2.60	8.31
2009	3.42	1.98	-0.49	7.32

Table 7.12 summarizes the mean hourly wage differential for workers leaving the gambling industry. Table 7.12 contains evidence of a positive hourly wage differential in three years (2001, 2005, and 2008), and a nearly positive hourly wage differential in three additional years (1997, 1999, and 2007). This indicates that workers who left the gambling industry earned significantly more in their next job. People who leave the gambling industry for another job do so because the new job pays more. This is entirely consistent with the evidence of relatively low compensation in the gambling industry on Table 7.4 above.

Another component of our LFS analysis focuses on detailed characteristics of workers hired into jobs in the gambling industry. We ask two questions: “Do new hires in the gambling industry take full time or part time jobs?” and “Were new hires in the gambling industry unemployed or employed before taking a job?” These two questions again help measure the impact that the gambling industry has on the labour force in Alberta. Due to the suppression of data from some of the years, because the relatively small counts in these cells did not always meeting the minimum number of unweighted observations, we are only able to present estimates for selected years for these questions.

Table 7.13 shows the proportions of full time and part time jobs among new hires into the gambling industry. We are only able to report results for the years 2000, 2001, and 2008 due to

low counts in cells, but results for the unreported years were similar. Notice from Table 7.13 that a majority of workers hired in jobs in the gambling industry were hired into full time positions. In each year, there were two or more fulltime jobs filled for every part time job filled in the gambling industry. That percentage also increased from the beginning of the decade to the end of the decade. This indicates that new entrants to jobs in the gambling industry get relatively good jobs.

Table 7.13: Employees Accepting Full Time or Part Time Work

Year	Part Time Proportion	Full Time Proportion	Part Time Total	Full Time Total
2000	0.387	0.613	1,471	2,326
2001	0.307	0.692	1,857	4,174
2008	0.204	0.796	1,134	4,428

Table 7.14 shows the labour force status of new entrants into jobs in the gambling industry. This is important because if firms hire workers from the ranks of the unemployed, this might have a more beneficial impact on the overall economy since these firms hire people off of the unemployment roll and reduce public assistance to these individuals. We generate estimates for the years 2003 through 2009. The results are shown on Table 7.14. From Table 7.14, in 2003, firms in the gambling industry hired more workers from the pool of unemployed than from the pool of currently employed workers. Since then, the percentage of new hires from the pool of unemployed workers in the province has decreased while percentage of new hires from the pool of employed workers has increased. Of course, the unemployment rate in Alberta declined steadily throughout the 2000s, falling from 5.3% in 2003 to just 3.4% in 2006 and 3.6% in 2008. Given these tight labour market conditions, relatively few people were unemployed in 2004-2007, making it difficult to hire unemployed workers into jobs in the gambling industry. The unemployment rate increased in 2008 and 2009, but the fraction of workers hired from the pool of unemployed workers in the province did not increase. This may reflect the fact that firms in the gambling industry simply were able to be more choosy about who they hired in the worsening labour market of the past two years. If labour market conditions remain soft in the next few years, the gambling industry could return to its hiring practices of the early 2000s and hire more unemployed workers. This would again be beneficial to the economy in Alberta.

Finally, the LFS data allow us to examine the tenure of employees in the gambling industry. Job tenure is an important measure of employment characteristics because firm-specific training tends to increase earnings and the longer a worker is employed at a firm the more on the job training is received. Each worker in the LFS is asked how many months he or she has been employed in their current job. This permits a comparison of the tenure of gambling industry employees and employees in other industries in Alberta. Over the period 1996 to 2009, the average tenure of an employee in the gambling industry in Alberta was just over 38 months; the average tenure of

Table 7.14: Labour Force Status of New Hires

Year	% Unemployed	% Employed	Provincial Unemployment Rate
2003	0.559	0.441	5.1%
2004	0.385	0.615	4.6%
2005	0.490	0.510	3.9%
2006	0.301	0.699	3.4%
2007	0.175	0.825	3.5%
2008	0.288	0.712	3.6%
2009	0.115	0.885	6.6%

Source: Authors' calculations, based on confidential LFS data

an employee in other industries in Alberta was 54 months. Gambling industry employees have a significantly shorter tenure at their jobs than workers in other industries. This is consistent with the relatively high turnover in employment in the gambling industry in Alberta documented above. It can be explained by the relatively low wages paid to gambling industry employees. A worker will switch to a better paying job if one becomes available, and jobs in the gambling industry in Alberta pay less than jobs in other industries, on average.

In summary, the LFS allows us to examine a number of interesting features of the labour force dynamics in the gambling industry. We performed a detailed analysis of the characteristics of individuals entering and leaving jobs in the gambling industry over the past decade. The results indicate that the gambling industry is integrated into the labour market in Alberta. Firms in the industry hire workers from a representative cross-section of other industries in the province, and those entering jobs in the gambling industry earn a similar hourly wage to their previous job. Most of the new hires go into full time jobs. Workers who depart for jobs in another industry earn a higher wage. The evidence suggests that the gambling industry is an important source of reasonable full time jobs in the province.

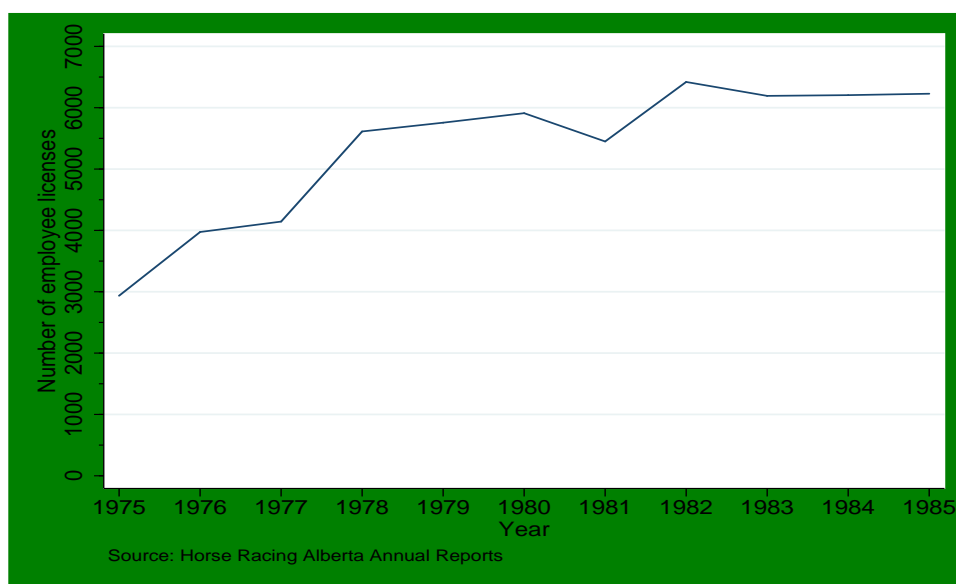
## 7.4 Employment in the Horse Racing Industry in Alberta

The horse racing industry is not identified in a single industry in the NAICS. Racehorse owners and Racehorse trainers are included in NAICS industry 7112 (Other Spectator Sports), but this is a catch-all industry that contains establishments like professional sports teams, race car drivers, and professional athletes in individual sports like golf and tennis. Horse racing is not separately identified in the NAICS. In order to overcome this limitation, Horse Racing Alberta provided us with data on the number of employees it licenses by year since 2001. Before 2001, the agency calculated those totals manually and the totals occasionally appeared in the annual report, but were

not released systematically. As a result, prior to 2001 the number of licensed employees is known only when the figure happened to be included in the annual report. The employee counts provided to us by Horse Racing Alberta do not reflect the full range of employment within the horse racing industry. As the annual reports constantly noted the reported counts do not reflect the employees hired by these licensed individuals, so it represents an undercount of actual employment in the industry. Horse racing is also a seasonal activity. The reports estimated that anywhere from eight to ten thousand employees (licensed and not licensed) worked as part of the horse racing industry at any one time during the year.

The annual reports from 1975 to 1985 provided a consistent yearly report of the number of employee licenses granted in each year. Figure 7.8 contains the counts for each year based on data appearing in the annual reports. From Figure 7.8, the number of employees grew throughout the time period and for the last few years was consistently over 6,000 licensed employees.

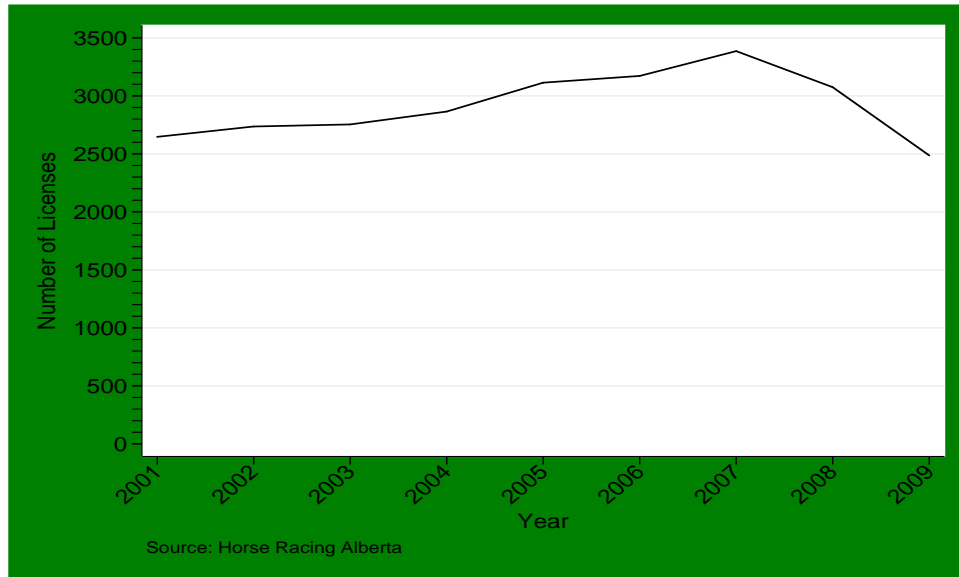
Figure 7.8: Number of Racing Licensed Employees: 1975-1985



After the 1975-1985 period, Horse Racing Alberta did not report information on licensed racing employees for many years. We only have access to license counts fifteen years later, beginning in 2001. We have no way of determining the number of licensed racing employees in the interim. Figure 7.9 shows the employee licenses granted by Horse Racing Alberta from 2001 through 2009.

On Figure 7.9, notice the steady increase in the number of licenses given out by HRA prior to 2007. Since 2007, the number of licenses decreased to around 2,500. Comparing Figure 7.8 with Figure 7.9, notice the overall decline in the number of licensed horse racing employees in the province. The reason for this decline is unclear. One reason could be that there are just a smaller number of employees in the market because of the decreasing interest in horse racing. Another

Figure 7.9: Number of Employee Licenses for Horse Racing: 2000-2009



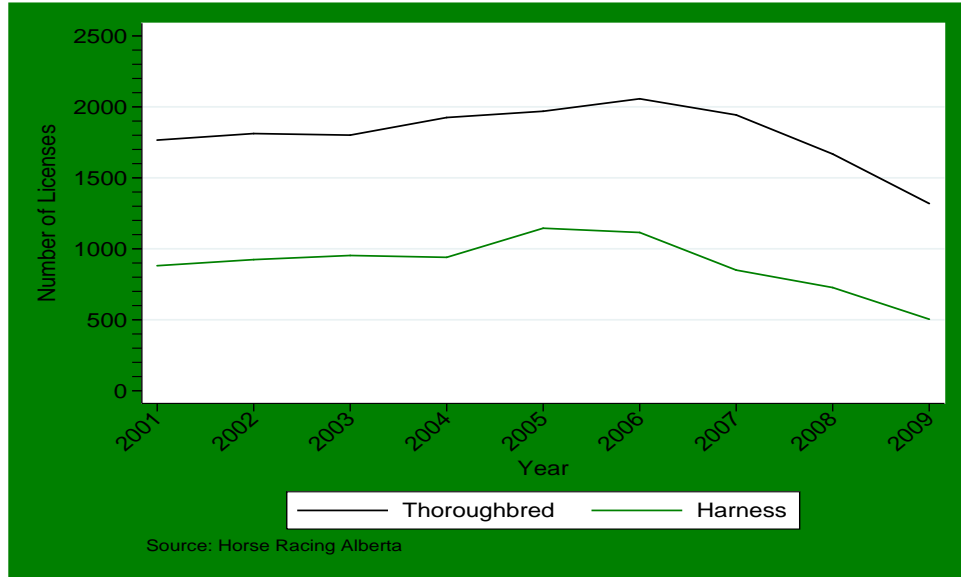
reason could be that licenses today do not cover as many occupations as they did between the years 1975 and 1985.

Horse Racing Alberta also provided us with a breakdown of the licenses by racing type (thoroughbred, harness, and “b-circuit” racing). The b-circuit license data are only available since 2007. Figure 7.10 shows the number of licenses for thoroughbred and harness racing. From Figure 7.10, notices that both thoroughbred and harness racing saw declines in the number of licensed employees during the period 2001 through 2009. Harness racing has around 500 licensed employees while thoroughbred racing currently has about 1,300 licensed employees.

## 7.5 Summary

The analysis of employment in the gambling industry relies on a number of secondary data sources in order to analyze the employment impact of the industry. As mentioned above, the NAICS Codes provide a very broad definition of the gambling industry. Unfortunately, we are not able to get an accurate count of the number of licensed gaming workers in Alberta from year to year. Once a person becomes a licensed gaming worker he/she does not have to renew the license. Therefore, it is impossible to determine how many licensed gaming workers are currently working in the province at any point in time. We can determine, from the secondary data sources, that there are between 5,000 and 10,000 gambling industry jobs in the province. There appears to be frequent turnover in these jobs, which results in frequent hiring by gambling industry businesses. Information from the

Figure 7.10: Employee Licenses Comparison: Harness & Thoroughbred



confidential LFS data confirms this. Our results suggest that Alberta gambling industry employees in Alberta make the lowest hourly wage among gambling industry employees in the major Canadian provinces. Finally, the gambling industry hired a fair number of unemployed workers in the early part of the sample, indicating that the gambling industry generates some positive impact for the community in that it reduced the pool of unemployed workers.

## 7.6 Conclusions

Data from three secondary sources were analyzed to understand the employment effects of gambling in Alberta: Canadian Business Patterns, the Survey of Wages, Payrolls, and Hours, and the Labour Force Survey. Each of these surveys has strengths and weaknesses in terms of the way the gambling industry is identified in the data and the characteristics of the labour market captured in each survey.

In all three surveys, there is no specific “gambling industry” identified. Businesses, and jobs, in these surveys are identified by the North American Industrial Classification Code System (NAICS). The NAICS identifies four national industries containing establishments that can be considered part of the gambling industry: *Casino Hotels* (NAICS Code 721120), *Casinos* (NAICS Code 713210), *Lotteries* (NAICS Code 713291), and *All Other Gambling Industries* (NAICS Code 713299). We define the gambling industry as establishments in these four NAICS codes, and employment in terms of employees at establishments in these national industries.

We use data from these three secondary data sources to document the size of the gambling industry, in terms of the number of establishments in this industry, the number of workers employed in the industry, the size of the payrolls at establishments in the industry, and the characteristics of employees in the industry. Based on the results from our analysis of the employment effects of gambling in Alberta, the following conclusions emerge:

**Canadian Business Patterns** According to the CBP, the number of employees in the gambling industry in 2008 was between 4,500 and 9,700. This estimate includes employment in sole proprietorships and partnerships that do not employ other people, as well as employment at larger establishments. It reflects employment in the four NAICS national industries listed above. Only a range can be estimated because the CBP data contain only establishment counts in eight total employment ranges. The estimated total employment from the CBP data grew steadily over the period 2000 to 2008.

**The Survey of Wages, Payrolls, and Hours** The number of gambling employees in the gambling industry in Alberta increased significantly over the past 20 years based on these data. This growth is contrary to the overall decline in the number of firms shown in the analysis of establishment counts in the CBP data. The additional employment in the industry must be due to the remaining firms increasing the number of employees. Total employment in the gambling industry increased from about 3,000 to about 5,000 in the SWPH data over the period 1991 to 2009. This estimate excludes employment in casino hotels, explaining in part why it is lower than the estimate from CBP establishments. However, this estimate lies in the range generated by the CBP establishments, so the two are consistent. Variation in month-to-month total employment in the gambling industry over the past 20 years was high which indicates significant turnover in employment in the gambling industry. Net job creation and destruction may be relatively high in the gambling industry in Alberta. Most of the employees in the gambling industry in Alberta are hourly employees, and hourly gambling employees in Alberta tend to earn less than hourly gambling employees in the rest of Canada. Salaried workers in the gambling industry in Alberta also earn less than salaried gambling industry workers in the rest of Canada.

Total payroll provides a convenient measure of the aggregate number of dollars put into the pockets of employees in the gambling industry in Alberta. These dollars get spent on consumer goods (housing, food, transportation, and other goods and services purchased by families in Alberta) or saved, so total payroll is also an indication of the effect of the gambling industry on other industries in the province. The total payroll also provides a rough measure of the impact of the gambling industry on taxes, since total payroll also reflects total income earned by employees in the gambling industry in the province. The total payroll of firms in the gambling industry nearly doubled over the period 1991 to 2008 in Alberta, and was nearly \$100,000,000 in 2008. The casino industry provides a significant amount of payroll to workers in the province.

**The Labour Force Survey** The LFS is a large scale, nationally representative, monthly survey of labour force conditions used to generate monthly estimates of economic conditions. The target population of the LFS is Canadians aged 15 years and older. The LFS contains detailed data on occupation and industry of employment for each survey participant. The LFS contains detailed data about the labor force status of Canadians, demographic characteristics of workers, and characteristics of the jobs they hold.

Each participant in the LFS is contacted monthly over a six month period. Since 1995, the LFS has surveyed approximately 54,000 Canadians each month. We exploit the fact that the LFS contains a large number of people and tracks them monthly for six months to analyze the dynamics of employment in the gambling industry in Alberta over time. Because of the large sample size, and long sample period, we observe a relatively large number of individuals employed in the gambling industry in Alberta for only part of the six months they appear in the LFS. We observe both individuals who begin employment in the gambling industry while in the LFS, and individuals who leave employment in the gambling industry while in the LFS.

In 2009, the estimated employment in the gambling industry in Alberta from the LFS was between 2,062 and 3,277 workers. This estimate is lower than the estimates from the CBP and SWPH, although still within the range of estimates generated from these other data sources. The average age of a worker in the gambling industry in Alberta was 38 years of age. The average age of workers in the industry increased over the period. In the late 1990s and early 2000s workers in the gambling industry were primarily female, but relatively more males have taken jobs in the industry in the 2000s.

The LFS allows us to analyze the characteristics of workers entering and leaving employment in the gambling industry. Most people hired in the gambling industry are hired into full time hourly jobs. The average hourly wage in these jobs was not statistically different from the average wage in their previous job, suggesting that workers may seek employment in the gambling industry for non-monetary reasons, including factors like better working hours, more flexibility of hours and shifts, a more convenient location, better working conditions, and the other characteristics of the specific jobs in the industry. The average tenure of workers employed in the gambling industry was 38 months, which is more than one year lower than the average tenure of employees in other industries in the province. In 2003, firms in the gambling industry hired more workers from the pool of unemployed than from the pool of currently employed workers. Since then, the percentage of new hires from the pool of unemployed workers has decreased and the percentage of new hires from the pool of employed workers has increased. In general, about two workers entering employment in the gambling industry come from an existing job in another industry for every new hire from the pool of currently unemployed workers. The relatively low unemployment rate in Alberta in the 2000s contributed to this imbalance. Workers hired into gambling industry jobs from jobs in other industries come from a representative group of industries. It does not appear that firms in



the gambling industry hire workers from any other specific industry. People who leave jobs in the gambling industry for jobs in another industry generally earn a higher hourly wage in their new job.

**Horse Racing Alberta** Horse Racing Alberta is the only gambling related oversight organization that keeps an accurate count of employee licenses given out on an annual basis. In 1985, there were over 6,000 registered employees in the horse racing industry. Currently, there are less than 2,500 registered employees. The horse racing industry has seen a huge contraction in the number of licensed employees over the past 20 years. This coincides with the general decline in horse race betting all over North America.

## 7.7 Implications

The gambling industry generates a significant number of jobs in Alberta's economy. Estimates of employment in the gambling industry range from about 5,000 on the low end to nearly 10,000 on the high end, depending on the data source. All estimates indicate sustained growth in the number of workers employed in the industry over time. In addition, there are about 2,500 registered horse racing employees in the province, so total employment in the industry could exceed 10,000. The payroll of firms in the gambling industry was nearly \$100,000,000 in 2008 and has also grown steadily over time. Both hourly and salaried workers in the gambling industry in Alberta earn lower salaries than other gambling industry workers in Canada. New workers taking jobs in the gambling industry typically get full time positions; firms in the industry hire both unemployed people and workers from other industries in the province. Although it is not large relative to other industries in the province, the industry makes important and growing contributions to provincial employment and earnings.

Employment and earnings by workers in the gambling industry in Alberta have grown over time. Jobs created in the industry have good characteristics, in that most are full time and some workers are hired from the pool of unemployed in the province. An equal mix of males and females work in the industry. The horse racing industry also contributes a significant number of jobs to employment, but less is known about the earnings and other characteristics of employment in the horse racing industry because it is not identified separately in the NAICS.

Much of the growth in establishments over time has been in casinos. Opening additional casinos in the province would lead to additional jobs in the industry, increases in the total payroll in the industry, and reductions in the unemployment rate. The new jobs created in the industry would be filled by people who are unemployed and by people employed in a representative cross-section

of other industries across the province. Most of these new jobs created would be full time hourly positions paying about \$13.50 per hour.

Closing casinos in the province and reducing other gambling opportunities at bingo halls and horse race tracks will clearly lead to fewer jobs and reduced earnings and payroll in the province. It could increase the unemployment rate if displaced workers are unable to find new jobs.

## Chapter 8

# Health and Well-being Impacts

### 8.1 Problem Gambling Incidence in Alberta

Problem gambling is an important component of any SEIG analysis. We anticipate that research by the University of Lethbridge research team will address problem gambling in Alberta in considerable detail. However, we have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult this report when it is made available.

### 8.2 Gambling and Happiness

Much like a doctor uses pulse rate and blood pressure to determine a person's health status, the health of society can be measured by how happy citizens report themselves to be. SEIGA researchers were interested in the effects that gambling can have on happiness, including problem gamblers, so we included a question about self reported happiness in the two population surveys conducted as part of this research.<sup>1</sup> The self reported happiness survey question read:

*In the past 12 months how would you rate your overall level of happiness?*

Responses were based on a 5 item scale from “very low” (1) to “very high” (5). The groupings on Table 8.1 are based on the Canadian Problem Gambling Index (CPGI), and respondents are placed in each category based on their responses to other question in the survey. The reported

Table 8.1: Reported level of Happiness by Canadian Problem Gambling Index Group

Reported Happiness	CPGI Category				
	Non-Gamblers	Non-Problem Gamblers	At Risk	Moderate	Severe
Very Low	1.3%	1.2%	1.9%	2.1%	9.0%
Low	3.3%	2.9%	7.0%	7.5%	18.7%
Moderate	35.2%	36.3%	44.2%	52.1%	47.8%
High	39.8%	44.1%	36.7%	29.5%	17.9%
Very High	20.4%	15.5%	10.3%	8.7%	6.7%

*Source: SEIGA population survey 2008*

responses are tabulated in Table 8.1, arranged by CPGI group. Ferris and Wynne (2001) discuss this commonly used measure of problem gambling.

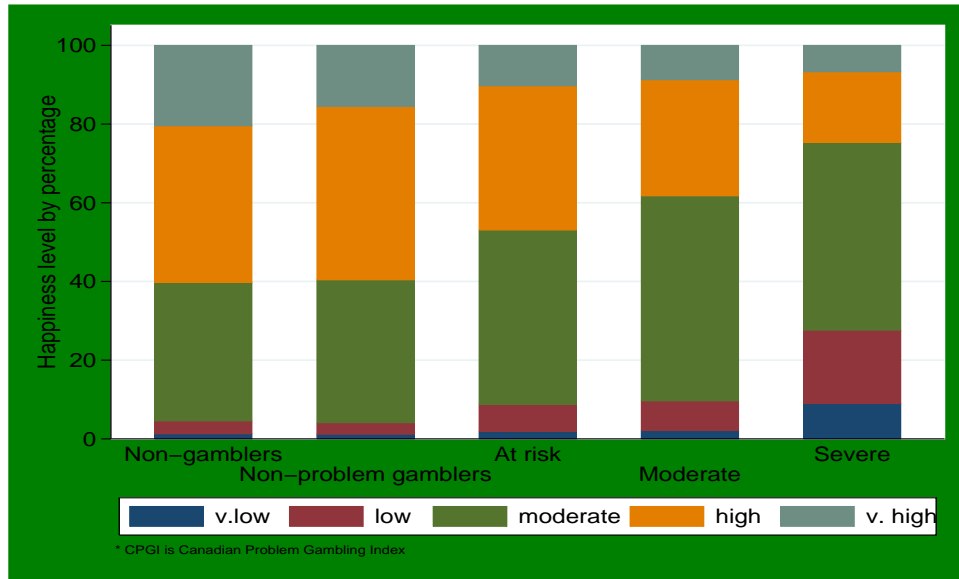
A striking difference in proportions of very low reported happiness compared to very high reported happiness between non-gamblers and severe problem gamblers can clearly be seen on Table 8.1. The proportion of Albertans surveyed reporting either very low or low happiness increases moving from left to right across the table. Only 1.3% of non-gamblers and 1.2% of recreational gamblers report a very low level of happiness, but 9% of severe problem gamblers report very low happiness. At the other end of the happiness scale, 20% of non-gamblers and 15.5% of recreational gamblers report a very high level of happiness while only 8.7% of moderate problem gamblers, and 6.7% of severe problem gamblers report a very high level of happiness. Figure 8.1 graphically depicts this information, and shows the same pattern. Non-gamblers and recreational gamblers in Alberta clearly have a higher level of self reported happiness than people with moderate or severe gambling problems.

This unconditional analysis does not tell us if gambling causes more or less happiness, it simply shows the statistical association between gambling and self-reported happiness in this sample of Albertans. In the next section we undertake a statistical analysis of these data using an Instrumental Variables approach that permits causal analysis of this relationship.

Figure 8.1 groups gamblers according to their CPGI scores from non-gamblers to severe problem gamblers. The reported percentages of happy or unhappy people are stacked in increasing happiness levels by each of the CPGI categories. The proportion of very unhappy people increases with problem gambling, and as well, the proportions that have a high or very high level of happiness decreases. Over 60% of non gamblers are happy or very happy, but only 25% of severe problems gamblers are as happy. The results in Figure 8.1 only show the reported results from survey participants and not the overall Alberta population. However, they do shed light on the relationship between intensity of gambling and happiness level.

<sup>1</sup>Professor Robert Williams of the University of Lethbridge designed the survey and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.

Figure 8.1: Reported Happiness by CPGI Groups, Population Survey



The diminished happiness of severe problem gamblers, who constitute only a small part of the sample, may not have a great impact on the overall well-being of society. At an individual level this may have a profound impact, though, severely reducing the quality and enjoyment of life. While failing to capture as much happiness from life as possible is always unfortunate, it is the job of psychologists and sociologists to determine whether people become sadder as their gambling problems worsen, which intuitively would seem to be the case, or whether sad people are somehow more inclined than their happier neighbours to develop severe gambling problems.

### 8.2.1 Statistical Evidence on Gambling and Happiness

Statistical analysis of survey data containing questions about factors like happiness and gambling must be undertaken carefully. Self reported happiness and the decision to gamble are determined simultaneously, and a number of unobservable factors affecting both decisions exist that can confound the statistical relationship between these variables. Because of these factors, simple unconditional statistical analysis, like tests of means, as well as conditional statistical analysis, like standard regression models and factor analysis, may yield misleading results about relationships in survey data. Some disciplines overcome these problems by using random assignment of subjects into treatment and control groups. In this case, we cannot randomly assign individuals into groups of gamblers and non-gamblers to assess the relationship between gambling and other variables of interest.

Several well-established statistical techniques exist to overcome the problem of simultaneous determination of economic variables in survey data and omitted variables problems. One widely

used approach is the method of Instrumental Variables (IV). In general, instrumental variables methods use a two-step approach to address statistical problems associated with simultaneous determination and omitted variables problems. In the first step, a variable of interest is “identified” through a regression model that is used to statistically predict the outcome of the variable of interest. This predicted value of the first variable of interest is, by construction, unrelated to any unobservable factors that can affect the second variable of interest. In the second step, the relationship between the predicted value of the first variable of interest and the second variable of interest is analyzed using a regression model. When using the IV method, the statistical relationship between the predicted values of the first variable of interest and the second variable of interest can be interpreted as causal, and not simply correlative, assuming that the first variable of interest was properly identified. The IV method has been widely used in economics, health and social sciences, and other areas where secondary data analysis without random assignment is common. Angrist, Imbens and Rubin (1996) describe the IV approach as applied in this setting, and provide a detailed discussion of the technique. Appendix E contains details about the IV models used in this report.

The key issue for implementing IV is to statistically identify the variable of interest. In IV models, identification come from a variable that explains the observed outcomes of the first variable of interest but is statistically unrelated to unobservable factors that affect second variable of interest. This variable is called an “instrument” in the jargon of statistics. In this case, we seek an instrument that explains an individual’s decision to participate in gambling but is unrelated to all observable and unobservable factors that affect an individual’s reported happiness. Finding appropriate instruments is not an easy process, and in many cases, a suitable instrument does not exist to identify a variable of interest. In this case, we exploit information about where individuals live, and proximity of their residence to a casino in the province, to identify gambling participation.<sup>2</sup> In particular, we calculated the driving distance between the postal code of the residence of each individual in the population survey and the nearest casino. We assume that this distance statistically explains individuals’ decision to gamble but is unrelated to individuals’ happiness. If this assumption holds, then we have statistically identified gambling participation, and can make causal statistical inferences about the effect of gambling on happiness. Note that this assumption requires that casinos are sited independently of the spatial distribution of happiness in the province and that individuals do not select their residence based on proximity to a casino. Appendix E contains details about the IV regressions, including diagnostic assessments of the strength of this instrument.

We use the instrumental variables (IV) technique to assess the relationship between participation in different types of gambling and self-reported happiness. We estimated separate IV models for six different types of gambling: lottery, scratch off lottery, bingo, slot machine play, VLT play,

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<sup>2</sup>Jennifer Arthur of the University of Lethbridge calculated the driving distance between the postal code of the residence of each person in the population survey and the closest casino. We acknowledge and thank her for this hard work.

and casino gambling. The first stage regression included the distance to the nearest casino and explanatory variables identified in the literature as important for explaining gambling: age, marital status, gender, level of education, employment status, income, and ethnicity. The second stage regression was a regression model with the five-item happiness variable as the dependent variable and the other explanatory variables from the first stage; this was estimated using OLS. Driving distance to the nearest casino was excluded from the second stage regression model. Table 8.2 summarizes the results of the IV estimation of the relationship between gambling and happiness for the six types of gambling activities. Table 8.2 reports the percent increase in reported happiness for participants in each type of gambling. Recall that these IV results can be interpreted as causal.

Table 8.2: The Effect of Gambling on Self-reported Happiness

Type of Gambling	% Change in Happiness From Participation In Gambling Type
Lottery Ticket Purchase	No Change
Instant Win Ticket Purchase	No Change
Bingo	-130%
Video Lottery Terminal Play	No Change
Slot Machine Play	No Change
Casino Gambling	+203%

From the results on Table 8.2, participation different types of gambling have different effects on the self-reported happiness of Albertans surveyed in the population survey. Lottery players, scratch off lottery ticket players, VLT players and slot machine players are not happier than Albertans who do not participate in these types of gambling. Bingo players are significantly less happy than people who do not play bingo; a 100% decline would move a person from, for example, “high” to “moderate” on the 5 point happiness scale in the survey. Casino gamblers are much happier than people who do not gamble at casinos; a 200% increase in reported happiness would move a person from, for example, “very low” to “moderate” on the 5 point happiness scale on the survey.

These results are consistent with others in the literature and in this report. Chapter 15 discusses the continual decline in the popularity of bingo in Alberta over the past 10 years. This decline is consistent with the idea that bingo players are unhappier than non-bingo players; if bingo reduces happiness, a decline in play would seem to be inevitable. The causal mechanism at work here is unclear. Casino gambling causes happiness to increase significantly, based on these IV results. Evidence from a travel cost model in section 6.3 indicates that casino gambling generates significant consumer surplus. An activity that increases happiness would be expected to generate significant consumer surplus, due the the consumption benefits. In addition, Forrest and McHale (2009) report that residents of the UK who gamble are happier than residents who do not gamble. These IV results suggest that an increase in the number of casinos in the province increases the overall level of self-reported happiness in the province, to the extent that additional casinos lead to increased

participation in casino gambling.

### 8.3 Statistical Evidence on Gambling, Stress, and Health

Stress plays an important role in health and well-being. Perlin (1989) contains an in-depth discussion of the relationship between stress and health. If participation in gambling is associated with increased stress, then there could be adverse health consequences from gambling. The 2008 population survey also contained a question asking individuals to disclose their perceived level of stress.<sup>3</sup> The question on the survey was

*In the past 12 months how would you rate your overall level of stress?*

Responses were based on a 5 item scale from “very high” (5) to “very low” (1). Higher numbers were associated with more stress. Table 8.3 summarizes responses to this question from the 2008 and 2009 population surveys by CPGI category. Many Albertans report quite a bit of stress. More than half reported either “moderate” or “high” stress in the population survey. Much like reported happiness, the fraction of respondents reporting higher levels of stress increases in with reported gambling problems as measured by the CPGI.

Table 8.3: Reported Level of Stress in By CPGI Category

Reported Level of Stress	CPGI Category				
	Non-gamblers	Non-problem	At Risk	Moderate	Severe
Very Low	16%	14%	17%	5%	9%
Low	20%	26%	25%	14%	6%
Moderate	44%	43%	38%	49%	51%
High	14%	12%	15%	19%	15%
Very High	6%	5%	6%	13%	19%

*Source: SEIGA population survey 2008, 2009*

The IV technique discussed in section 8.2.1 above can also be applied to the relationship between gambling and stress. In the previous section, we estimated separate IV models for six different types of gambling: lottery, scratch off lottery, bingo, slot machine play, VLT play, and casino gambling. The first stage regression included the distance to the nearest casino and explanatory variables identified in the literature as important for explaining gambling: age, marital status, gender, level of education, employment status, income, and ethnicity. The second stage regression

<sup>3</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.



was a regression model with the stress variable as dependent variable and the other explanatory variables from the first stage. Driving distance to the nearest casino was excluded from the second stage regression model. Table 8.2 summarizes the results of the IV estimation of the relationship between gambling and stress for the six types of gambling activities. Table 8.2 reports the percent increase in reported stress for participants in each type of gambling. Recall that these IV results can be interpreted as causal.

Table 8.4: The Effect of Gambling on Self-reported Stress

Type of Gambling	% Change in Stress From Participation In Gambling Type
Lottery Ticket Purchase	No Change
Instant Win Ticket Purchase	No Change
Bingo	No Change
Video Lottery Terminal Play	No Change
Slot Machine Play	-15%
Casino Gambling	-262%

From the results on Table 8.4, participating in certain types of gambling reduces stress. Playing slot machines reduces self-reported stress slightly. Casino gambling reduces stress significantly. A 200% reduction in stress would move an individual from the “high” stress level to the “low” stress level based on the 5 point stress question on the survey. Again, the causal mechanism that exists between gambling and stress is unclear, although gambling involves the resolution of uncertain events in a quick and easy to grasp manner. This resolution of unknown events could reduce stress.

The population survey also contained a question about the relationship between gambling and health problems.<sup>4</sup> This question on the survey read

*In the past 12 months, has your gambling caused you any health problems, including stress or anxiety?*

Responses were based on a four item scale from “never” (0) to “almost always” (3). Table 8.5 summarizes the results for the 2008 and 2009 population surveys by CPGI category. Reported gambling related health problems are quite rare in Alberta. Only among individuals in the “Moderate Gambling Problems” and “Severe Gambling Problems” CPGI classifications do we observe any respondents reporting gambling related health problems.

Most Albertans appear to not experience health problems as a consequence of participating in gambling. However, unconditional analysis of such data may suffer from the statistical problems

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<sup>4</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.

Table 8.5: Reported Frequency of Gambling-related Health Problems by CPGI Category

Gambling Related Health Problems	CPGI Category				
	Non-gamblers	Non-problem	At Risk	Moderate	Severe
Never	100%	100%	96%	75%	33%
Sometimes	0%	0%	4%	22%	30%
Most of the Time	0%	0%	0%	1%	10%
Almost Always	0%	0%	0%	1%	27%

*Source: SEIGA population survey 2008, 2009*

discussed earlier in this chapter. Like above, we used instrumental variables to assess the relationship between participation in different types of gambling and the likelihood that an individual reported experiencing bad health as a consequence of gambling. We again estimated separate IV models for six different types of gambling: lottery, scratch off lottery, bingo, slot machine play, VLT play, and casino gambling. The first stage regression included the distance to the nearest casino and explanatory variables identified in the literature as important for explaining gambling: age, marital status, gender, level of education, employment status, income, and ethnicity. The second stage regression was a probit model with an indicator variable for individuals reporting bad health as a consequence of gambling and the other explanatory variables from the first stage. Driving distance to the nearest casino was excluded from the second stage probit model. Table 5.4 summarizes the results of the IV estimation of the relationship between gambling and reported health problems for the six types of gambling activities. Table 5.4 reports the marginal effect of participating in each type of gambling on the probability that an individual reported health problems. Recall that these IV results can be interpreted as causal.

Table 8.6: The Effect of Gambling on Self-reported Health Problems

Type of Gambling	Change in Probability that Individual Reported Poor Health because of Participation in . . .
Lottery Ticket Purchase	+0.08%
Instant Win Ticket Purchase	No Change
Bingo	No Change
Video Lottery Terminal Play	No Change
Slot Machine Play	+3.8%
Casino Gambling	No Change

From the results on Table 8.6, lottery ticket buyers and slot machine players are more likely to report health-related problems from their gambling than non-participants in this activity. Note that in the case of lottery ticket buyers, the effect is quite small in size. Participation in other types of gambling has no effect on the probability of reporting gambling-related health problems.

## 8.4 Summary

The relationship between gambling and health and well-being is complex. Because many people enjoy participating in gambling activities, part of the impact of gambling on health and well-being is positive. We find evidence that casino gambling makes people happier, and that slot machine play and casino gambling reduces self-reported stress. This is an important finding because it shows that the benefits that people receive from casinos is not just related to increases in tax revenues or a jobs which are the common ones mentioned in the public debate about whether or not to expand gambling within a jurisdiction. On the other hand, problem gambling status appears to be associated with less self-reported happiness and more self-reported stress, and participating in bingo appears to reduce happiness. Although results from the population surveys carried out as part of this research project suggest little relationship between health and gambling, this chapter contains some weak evidence that slot machine play leads to slightly worse self reported health.

This chapter develops evidence that the relationship between gambling and health and well-being is not entirely negative. Some types of gambling appear to make people happier and less stressed. The underlying mechanisms that would lead to these outcomes are not well-understood at this time, but these results suggest a new area of research for gambling researchers.

Of course problem gambling is an important component of any SEIG analysis, especially in this impact domain. We anticipate that research by the University of Lethbridge research team will address problem gambling, and the effect of problem gambling on health and well being in Alberta in considerable detail. However, we have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult the Lethbridge report when it is made available.

## 8.5 Conclusions

Many of the conclusions drawn from the Health and Well-being domain depend on the detailed analysis of problem gambling rates in the province. This analysis was performed by the University of Lethbridge research team. We have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult this report when it is made available. The volume from the Lethbridge team contains a detailed summary of conclusions about problem gambling.

We analyzed the population survey data to assess the impact of gambling on three facets of health and well-being. The focus was to assess the impact of participation in types of gambling activities on self-reported health, self-reported stress, and self-reported happiness in the population

surveys. Self-reported health is likely correlated with use of the provincial health system, lost work days, and quality of life. If participation in gambling leads to worse health, then gambling generates external costs generated by treating these health problems that are borne by society, and the overall quality of life in the province is diminished. Stress has been linked to adverse health outcomes in the clinical literature, so a relationship between gambling and stress would also suggest the presence of significant external costs associated with gambling. Happiness is an important indicator of well-being that has received considerable attention in the research literature in the past few years.

From our analysis of the 2008 and 2009 survey data, we conclude that non-gamblers and non-problem gamblers are more likely to report being happy than at-risk and problem gamblers. However, this conclusion is limited as it merely shows a correlation between happiness and gambler status and does not delve into whether there is a causal link between having a gambling problem and being unhappy. Participation in different types of gambling has different effects on the self-reported happiness of Albertans surveyed in the population survey. Lottery players, scratch off lottery ticket players, VLT players and slot machine players are not happier than Albertans who do not participate in these types of gambling. Bingo players are significantly less happy than people who do not play bingo; a 100% decline would move a person from, for example, “high” to “moderate” on the 5 point happiness scale in the survey. Casino gamblers are much happier than people who do not gamble at casinos; a 200% increase in reported happiness would move a person from, for example, “very low” to “moderate” on the 5 point happiness scale on the survey.

Using the instrumental variables (IV) methodology to control for statistical problems in the data, we conclude that Albertans who purchase lottery and instant-win tickets; play VLTs and slot machines; and play casino games are no more or less happy than others who do not engage in these gambling activities. It may also be concluded that those who play bingo are significantly less happy than those who do not and, in contrast, those who play casino games are significantly happier.

Participating in certain types of gambling also reduces stress. Playing slot machines reduces self-reported stress slightly. Casino gambling reduces stress significantly. A 200% reduction in stress would move an individual from the “high” stress level to the “low” stress level based on the 5 point stress question on the survey. In general, there is little evidence of a link between participation in gambling and self-reported health problems in the province. The exception is that lottery ticket buyers and slot machine players are more likely to report health-related problems from their gambling than non-participants in this activity.

## 8.6 Implications

Gambling does not appear to be deleterious to the health and well-being of Albertans, except among at-risk and problem gamblers. Instead, participating in some types of gambling reduces

stress and increases happiness, both of which indicate the presence of significant external benefits associated with participation in gambling. An increase in the availability of legal gambling could be expected to make Albertans happier and reduce their level of stress. These effects are especially strong among casino gamblers; the IV results indicate that participating in casino gambling causes important reductions in self-reported stress and increases in self-reported happiness. Of course, an expansion of casino gambling will also lead to increases in at-risk and problem gambling, and the related problems associated with gambling problems. However, the costs associated with problem gambling must be assessed relative to the increase in self-reported happiness and reduction in stress caused by increased access to casino gambling.

Bingo, on the other hand, is a different matter. Unlike other forms of legal gambling in Alberta, bingo appears to generate negative externalities. Bingo players are less happy than non-bingo players. This may be one reason why bingo play has dropped significantly in the past decade in the province. The mechanism through which bingo reduces happiness is unclear, but it may have something to do with the characteristics of the game, or perhaps because unhappy people select themselves into bingo, or happen to live where bingo is available.

## Chapter 9

# Legal and Justice Impacts

Anielski and Braaten (2008) identified legal and justice as an “Impact Theme” in his SEIG framework. This impact theme listed a number of potential benefits associated with legal gambling, including reductions in illegal gambling attributable to increased availability of legal gambling opportunities, decreased gambling-related crime like embezzlement and fraud attributable to increased availability of legal gambling opportunities, and decreased judiciary and policing costs. Anielski and Braaten’s (2008) legal and justice impact theme also listed a number of potential costs associated with legal gambling, including violent and non-violent crimes attributable to gambling, negative economic impacts from crime including losses to businesses from gambling related theft fraud, loan sharking, etc., increased public judiciary and policing costs attributable to gambling, and additional private security costs attributable to gambling.

Walker (2007) argued that accounting for legal and justice costs (and benefits) of gambling based on government provision of judicial and police services is difficult to measure, may confuse benefits with costs, and suffers from problems related to the inherent fungibility of government budgets. Clearly, any attempt to identify incremental costs to the judiciary and police attributable to gambling requires dubious assumptions. Even if the total number of crimes in disaggregated categories (robbery, fraud, theft, etc.) directly caused by gambling were known with certainty, the operation of the judicial and policing branches of government are characterized by large fixed costs (the salaries of judges, clerks, and police officers represent a large portion of total costs, as do equipment and physical capital) and small variable costs. Fixed costs cannot be easily apportioned across individual crimes or criminals. Also, society clearly benefits from the judicial and policing branches of government; attributing spending of these functions to a “cost” seems inconsistent with the societal benefits from these government activities. Based on Walker’s (2007) criticisms, and our assessment of these criticisms, we will focus only on estimating relationship between gambling and the commission and detection of crime in this analysis, and do not attempt to estimate a dollar value of the benefits and costs of crime in the operation of the judiciary or police force.

## 9.1 The Impact of Gambling on Crime

Smith and Wynne (1999) conducted a study of the relationship between gambling and crime in Western Canada. Using qualitative methodology (interviews, content analysis, etc), the authors determined that legal gambling venues in Western Canada “act as magnets that attract certain types of crime” (Smith & Wynne, 1999, p. 101). They also reported that the crimes most likely to be committed by gamblers included theft, fraud, credit card scams, and breaking and entering, and that legal gambling had a variable impact on illegal gambling, sometimes increasing illegal gambling and sometimes decreasing it. Smith and Wynne (1999) also debunked some common myths about the link between gambling and crime. These myths included the alleged existence of a clear link between higher availability of gambling and higher crime rates and the perception that organized crime controls the operation of many gambling venues.

Grinols and Mustard (2006) performed an extensive statistical analysis of the relationship between casinos and crime in the United States. Using a statistical method that controlled for unobservable county-specific characteristics, local economic conditions, and other factors that could confound the relationship between the opening of casinos and crime, Grinols and Mustard (2006) concluded that approximately 8% of the crimes occurring in US counties with casinos was attributable to the presence of casinos. The crimes affected by casino openings included several types of violent crimes (aggravated assault, robbery, rape), burglary and auto theft. The crime rates increased 3 to 5 years after the opening of a casino in a county.

The results reported by Grinols and Mustard (2006) have attracted considerable attention and have not gone unchallenged. Reece (2010) casts serious doubt on the conclusion that casinos cause crime to increase by showing that an omitted factor, the presence of a large number of hotels, and people staying in these hotels, near casinos explained much of the observed increase in crime. Hotel patrons make inviting targets for criminals committing crimes like robbery and car theft. Reece (2010) also explained the temporal lag between the opening of a casino and the increase in crime. Grinols and Mustard (2006) postulated that the lag was due to the time it took problem gamblers to squander their existing assets on gambling before turning to crime; Reese (2010) showed that hotels were built and opened several years after casinos opened in communities. In addition, Walker (2008a, 2008b) criticized Grinols and Mustard on methodological grounds. Although no clear consensus exists in the literature, the statistical analysis of secondary crime data using casino openings as “natural experiments” has advanced in the past few years, and can provide important information about the relationship between gambling and crime.

In our examination of the legal and justice impacts of gambling in Alberta, we employ a statistical analysis of secondary crime data like that used by Grinols and Mustard (2006) and Reece (2010), rather than the qualitative methodology used by Smith and Wynne (1999). The secondary data source used, the Uniform Crime Reporting Survey (UCR), comes from Statistics Canada in

association via the Canadian Centre for Justice Statistics. The UCR is an annual census based on all incidents of crime reported to the policing community in jurisdictions in Canada. Detailed historical crime data are available for a large number of communities in Alberta in the UCR. According to the documentation, the UCR data are described as

“Information collected by the survey includes the number of criminal incidents, the clearance status of those incidents and persons-charged information. The UCR Survey produces a continuous historical record of crime and traffic statistics reported by every police agency in Canada since 1962. In 1988, a new version of the survey was created, UCR2, and is since referred to as the “incident-based” survey, in which microdata on characteristics of incidents, victims and accused are captured.”<sup>1</sup>

The Canadian Centre for Justice Statistics (CCJS) cooperates with various police agencies to collect crime statistics through the UCR. The survey measures the incidence of all crime in Canada. The data reflect reported crimes substantiated by police investigation. The UCR survey contains a continuous record of crime data available from every police agency in Canada since 1962. A new version of survey, called the ‘UCR2’ (an “incident-based” survey) was introduced in 1988. The UCR survey contains two versions, an aggregate survey (UCR1) and an incident-based survey (UCR2). In both surveys, an ‘incident’ is the basis for counting a reported crime; an ‘incident’ is defined as a set of connected crime-related events usually constituting an occurrence report. An incident is the basic unit of crime accounting in the UCR, and represents a single event that may include multiple crimes. An incident that involves the commission of multiple crimes is identified only once in the UCR, based on the most serious offence committed. This avoids double counting of crimes. Under the most serious offense procedure, an incident containing a non-violent crime, say breaking and entering, and a violent crime, say assault, will be recorded only as an assault; this procedure can result in under counts of crimes related to gambling. The UCR data contains information on the number of criminal incidents, incidence rates (per 100,000 population) and the clearance rate of those incidents from 1977 to 2007. We use data from the UCR1 to analyze the relationship between gambling and crime in Alberta.

The unit of observation in the UCR is individual Royal Canadian Mounted Police (RCMP) Divisions and metropolitan police force jurisdictions in Canada. The crime data in the UCR are available annually over the period 1977 to 2008. After eliminating observations from RCMP Divisions and municipal police forces with missing data, the sample included crime data from 78 communities in Alberta. A list of these communities can be found in Technical Appendix D. Note that we analyze only data from the urban part of the police jurisdictions. The UCR contains data on incidents from the rural part of RMCP Divisions in Alberta beginning in 2002, but the UCR

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<sup>1</sup><http://www.statcan.gc.ca/cgi-bin/imdb/p2SV.pl?Function=getSurvey&SDDS=3302&lang=en&db=imdb&adm=8&dis=2>



data does not contain information on the population of these rural areas. The literature clearly identifies population as an important determinant of crime (the larger the population in an area, the more potential criminals and victims), and without a measure of population in the area where crimes are committed, we cannot perform a thorough statistical analysis. While we recognize that this limits the results somewhat, if the relationship between gambling and crime in rural areas is similar to the relationship in urban areas, then our results can be generalized to the entire province. In any event, the vast majority of crime incidents take place in the urban part of RMCP Divisions.

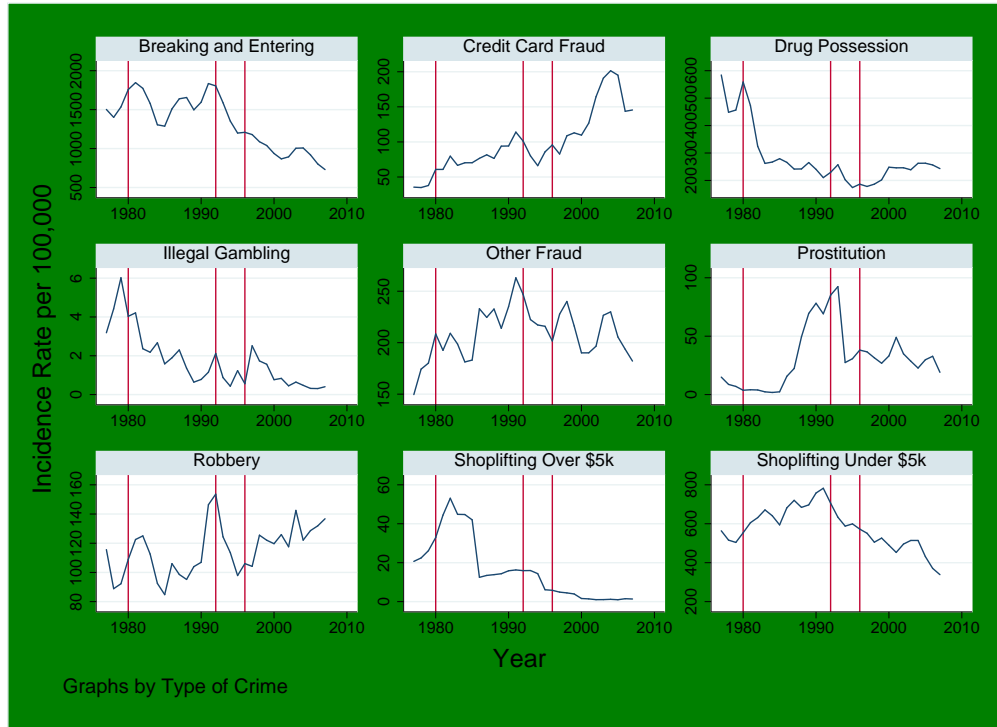
Although Grinols and Mustard (2006) found that casino openings were related to violent crimes in the US, violent crime rates in Canada are substantially lower, and research by Smith and Wynne (1999) indicated that most of the crimes associated with gambling in Western Canada are non-violent in nature. Accordingly, we focus our statistical analysis on nine specific crimes identified in the UCR data: breaking and entering, credit card fraud, drug possession, illegal gambling, other fraud, prostitution, robbery, shoplifting over \$5,000 and shoplifting under \$5,000. The “other fraud” category includes writing bad checks, selling goods or services that are never produced, or other deceitful actions. The Criminal Code of Canada defines frauds as: “Every one who, by deceit, falsehood or other fraudulent means, whether or not it is a false pretence within the meaning of this Act, defrauds the public or any person, whether ascertained or not, of any property, money or valuable security or any service.” This list of crimes includes many crimes associated with gambling identified by Smith and Wynne (1999) as well as other less serious crimes that could be plausibly linked to legal gambling.

Figure 9.1 shows the annual incidence rate per 100,000 persons for these nine crimes in Alberta over the period 1977-2008. The red vertical lines identify three important gambling-related events in Alberta: the opening of casinos (1980), the introduction of VLTs (1992), and the introduction of slot machines in casinos (1996).

This figure is intended to provide a general picture of the incidence rates and trends over the sample period. These are incidence rates, not closure rates, so they indicate the number of crimes of each type reported to the police and determined to be genuine. Keep in mind that the use of the most serious offence procedure means that these rates understate the actual incidence rate for these crimes to the extent that some incidents included these crimes and a more serious crime. For example, an incident that included commission of both breaking and entering and murder would be counted as a murder, the most serious crime, in the UCR data.

Some of these crimes, including breaking and entering, drug possession, illegal gambling and shoplifting, show clear downward trends in the incidence rates over the sample period. Others, including credit card fraud and robbery, show upward trends. There is also quite a bit of year-to-year variation in the sample period. While these graphs are informative, any analysis of the statistical association between crime and gambling must be based on a conditional analysis of incidence rates, and not simple examination of graphs.

Figure 9.1: Crime Incidence Rates in Alberta 1977-2008



*Red lines indicate the introduction of legal gambling activities in the province*

In this report, we focus on the statistical relationship between crime and two types of legal gambling in Alberta: VLTs and casinos. While many other types of legal gambling exist, including lottery, sports betting, bingo, and horse racing, casino gambling and VLTs receive most of the public attention and the lion's share of attention in the research literature. Casino gambling and VLTs, unlike bingo and horse racing, have been growing in popularity in recent years, and policy makers face pressure to increase the number of venues and machines in the province.

## 9.2 Statistical Analysis of VLTs, Casinos and Crime Rates

We performed a statistical analysis of the relationship between the opening of casinos in the province and the introduction of VLTs in bars and taverns and historical crime incidence rates in each of the 78 communities identified on Table D.8 in Technical Appendix D over the period 1977-2008. The details of this statistical analysis can be found in Technical Appendix D. The general approach uses multiple regression techniques to estimate the conditional correlation between the number of casinos in the province and the number of VLTs in communities, and the annual incidence rate per 100,000 in population for the 9 crimes identified above. This multiple regression approach explains observed variation in crime incidence rates across communities and over time with observed

variation in other factors that have been shown to affect crime rates in the literature, including economic factors like the unemployment rate, demographic factors like the population, and variation in gambling opportunities across communities and over time. The multiple regression models control for unobservable heterogeneity in the communities and years in the sample, as well as the effect of confounding factors like the unemployment rate in the province and the population of the community, and province wide trends in crime rates. However, the regression results are measures of statistical association, and not causal estimates, so they must be interpreted with care.

The number of casinos in the province, and their opening and closing dates, can be found in Appendix A. We obtained detailed data on the number of VLTs in each community from the Alberta Gaming and Liquor Commission (AGLC). The AGLC VLT data begin in 1994, one year after the introduction of VLTs in the province. These data are annual, and identify the number of VLT machines in each community. Eight communities in the sample (Blairmore, Cardston, Coleman, Crowsnest Pass, Hobbema, Lesser Slave Lake, Louis Bull, Raymond, and Redcliff) had no VLTs. Since the crime data begin before the introduction of VLTs in the province, this analysis constitutes a “before and after” statistical analysis like that performed by Grinols and Mustard (2006). Our regression results reflect conditional crime rate estimates before and after the introduction of VLTs, between communities with and without VLTs, and within communities with VLTs, since the number of VLTs in communities varies over the sample period.

Table 9.1 shows the sample means for the nine crime incidence rates per 100,000 in population and the other key variables in this analysis. The average population of the communities is 29,214 and the average number of VLTs in each community is 31. The breaking and entering incidence rate is much higher than the other crimes. Illegal gambling is relatively rare in the province. However, bear in mind that these are incidence rates, not the rate of commission of crimes. Every crime committed is not reported to authorities, so incident rates under state the rate at which crimes are committed. Smith and Wynne (1999) report that the enforcement of illegal gambling laws is relatively lax in the province, so the actual rate of commission of these crimes in the province is likely substantially higher.

The introduction of VLTs, and changes in the number of VLTs in communities over time, provide variation in the access to VLT gambling in each community and variation within each community over time. The multiple regression model exploits this variation to quantify the relationship between crime VLT gambling, conditional on other observable and unobservable factors that affect crime. A separate multiple regression model was estimated for each type of crime. The parameters of interest here captures the relationship between observed variation in crime rates and observed variation in the number of VLTs in each community.

Table 9.2 summarizes the results for the regression models that analyze the statistical association between crime and VLTs over the period 1977-2008. Again, recall that regression parameter

Table 9.1: Sample Means, Crime Incidence Rates and other Variables, 1977-2008

Variable	Mean
Breaking and Entering Incidence Rate per 100,000 population	1,095
Credit Card Fraud Incidence Rate per 100,000 population	54
Drug Possession Incidence Rate per 100,000 population	397
Illegal Gambling Incidence Rate per 100,000 population	2
Other Fraud Incidence Rate per 100,000 population	295
Prostitution Incidence Rate per 100,000 population	3
Robbery Incidence Rate per 100,000 population	31
Shoplifting Over \$5,000 Incidence Rate per 100,000 population	16
Shoplifting Under \$5,000 Incidence Rate per 100,000 population	390
Community Population	29,000
Unemployment Rate	7
# of VLTs in Community	31

estimates are random variables. While it is possible to place a specific value on regression parameter estimates, it is more informative to express them in terms of confidence intervals. The standard confidence interval for regression analysis is 95%. The interpretation of a 95% confidence interval is that, in statistical terms, based on the available data and model, the researcher is 95% confident that the true parameter—in this case the actual relationship between VLTs and crime—lies within this interval. There is also a small chance, in this case 5%, that the true parameter is bigger or smaller than the upper and lower bounds, but random variation prevented the regression model from accurately estimating the true parameter. Confidence intervals are defined by an upper and lower bound, which is simply a particular value of the parameter estimate. Table 9.2 shows values at the upper and lower bound, and at the parameter estimate, which can be interpreted as the expected value of the true parameter.

Table 9.2 shows the change in the number of incidents per 100,000 population per year for each crime type that was associated with an increase of 100 VLTs in a community. From Table 9.1 the average size of a community was about 30,000, so the estimates on Table 9.2 for an average size community would have to be divided by 3.3.

The regression results indicate little relationship between VLTs and crime in communities in Alberta since the introduction of VLTs in the early 1990s. There was no statistical association between the number of VLTs in communities and breaking and entering, drug possession, illegal gambling, fraud, and robbery. Credit card fraud was slightly higher in communities with VLTs, but the effect was small, since 100 additional VLTs were associated with an increase of between 1 and 11 credit card frauds per 100,000 population.

Interestingly, the association between the presence of VLTs and prostitution and shoplifting was negative. The incident rate of these crimes tended to decline slightly after VLTs were introduced to

Table 9.2: Change in Annual Incidents in Area Associated with Each Additional 100 VLTs

Crime	Lower Bound (95% CI)	Average	Upper Bound (95% CI)
Breaking and Entering	No Association	No Association	No Association
Credit Card Fraud	1	6	11
Drug Possession	No Association	No Association	No Association
Illegal Gambling	No Association	No Association	No Association
Other Fraud	No Association	No Association	No Association
Prostitution	-6	-3	-1
Robbery	No Association	No Association	No Association
Shoplifting Over \$5,000	-3	-2	-1
Shoplifting Under \$5,000	-26	-17	-8

communities. It is important to keep in mind that these estimates are not causal, so the results do not mean that introducing VLTs caused the incidence rate of these crimes to fall in communities; it simply means that VLTs were statistically associated with lower crime. One causal explanation for the observed relationship between VLTs and prostitution is that some individuals have a “vice” budget that they spend on illicit behavior. When VLTs are introduced, some individuals with preferences for illicit behavior may substitute VLT gambling for dealings with prostitutes. One causal explanation for the relationship between VLTs and shoplifting is that shoplifting has a “thrill” component and after the introduction of VLTs individuals who would have satisfied this desire for a “thrill” by shoplifting instead satisfy it by playing VLTs.

Another explanation for the observed negative statistical relationship between VLTs and crime is that the model is mis-specified. We could be omitting important variables that affect the incident rate of crime and happen to be correlated with VLTs. Alternatively, the regression model may fail to adequately account for the clear downward secular trend in prostitution and shoplifting in Alberta after 1990 visible on Figure 9.1. The regression model contains a time trend variable that should capture this downward trend, but the trend in the model is linear and the actual trend could be nonlinear. Alternatively, VLTs may have been placed in communities that experienced relatively large declines in prostitution and shoplifting by chance.

Next, we turn to a statistical analysis of the association between casinos and crime in the same 78 communities in Alberta. We use the same multivariate regression model to analyze the statistical association between casinos and crime as was used to analyze the association between VLTs and crime. This multiple regression approach explains observed variation in crime incidence rates across communities and over time with observed variation in other factors that have been shown to affect crime rates in the literature, including economic factors like the unemployment rate, demographic factors like the population, and variation in the number of casinos present in communities and over time. The multiple regression models control for unobservable heterogeneity in the communities

and years in the sample, as well as the effect of confounding factors like the unemployment rate in the province and the population of the community, and province wide trends in crime rates. However, the regression results are measures of statistical association, and not causal estimates, so they must be interpreted with care.

The key explanatory variable in the statistical analysis of the association between crime and casinos is the number of casinos present in each community. In this case, only 10 of the communities (Calgary, Camrose, Cold Lake, Edmonton, Fort McMurray, Grand Prairie, Lethbridge, and Medicine Hat) had casinos present in one or more years in the sample period. Note that this is a relatively simplistic measure of gambling opportunities, since it treats all casinos as equal in terms of their potential to affect crime rates. Since casino handle and patronage varies, a better approach would use a measure of the gambling activity that takes place inside casinos instead of an indicator variable. We lack complete data to perform this analysis.

Table 9.3: Change in Annual Incidents in Area Associated with Each Additional Casino

Crime	Lower Bound (95% CI)	Parameter Estimate	Upper Bound (95% CI)
Breaking Entering	No Association	No Association	No Association
Credit Card Fraud	No Association	No Association	No Association
Drug Possession	No Association	No Association	No Association
Illegal Gambling	No Association	No Association	No Association
Other Fraud	No Association	No Association	No Association
Prostitution	No Association	No Association	No Association
Robbery	2	10	17
Shoplifting Over \$5,000	No Association	No Association	No Association
Shoplifting Under \$5,000	-124	-66	-7

Table 9.3 summarizes the association between casinos and crime when the explanatory variable is the number of casinos in the community. This is a local effect because it assumes that the effect of the casino on crime does not extend beyond the local community. Note that the multiple regression results indicate little statistical association between casinos and crime using this specification. The annual number of robberies committed in each year increases by between 2 and 17 per 100,000 population, and the number of shoplifting cases under \$5,000 declines by between 7 and 124 in each year. The annual incidence of other crimes has no statistical association with the presence of casinos in the local community.

Unlike VLTs, casinos may have a wider geographic impact on crime, as casino patrons may travel relatively long distances gamble at casinos. In Chapter 6, we present evidence from the Travel Survey of Canadian Residents that shows the average distance traveled on a trip to a casino was 172 kilometers. To explore the possibility that the association between casinos and crime extends beyond the local area, we aggregated the community-level data used here to the level of Alberta census divisions. The 19 census divisions in Alberta are described in Figure 19.1 on

page 260 and Table 19.1 on page 259, in the geography chapter of the report. In this case, the variable of interest is the number of casinos present in the census division. This regression model implicitly assumes that the presence of casinos in a census division affects crime in all communities in that region equally. While this relationship clearly does not hold exactly, the assumption allows us to investigate the possibility that casinos affect crime in a wider geographic area using existing data. By aggregating the data to the census division level, the statistical analysis will capture, for example, the effect of the Casino in St. Albert on crime in Sherwood Park.

Table 9.4: Change in Annual Incidents in Census Region Associated with Each Additional Casino

Crime	Lower Bound (95% CI)	Parameter Estimate	Upper Bound (95% CI)
Breaking and Entering	No Association	No Association	No Association
Credit Card Fraud	No Association	No Association	No Association
Drug Possession	No Association	No Association	No Association
Illegal Gambling	No Association	No Association	No Association
Other Fraud	No Association	No Association	No Association
Prostitution	1	6	12
Robbery	No Association	No Association	No Association
Shoplifting Over \$5k	-1	-3	-5
Shoplifting Under \$5k	No Association	No Association	No Association

Table 9.4 summarizes the statistical association between casinos and crime at the census division level in Alberta. Again, the analysis shows little statistical association between casinos and crime at the regional level in Alberta. There was a small positive association between casinos and incidents of prostitution, and a small negative association between casinos and shoplifting.

It is important to again keep in mind that these estimates are not causal, so the results do not mean that opening casinos caused the incidence rate of shoplifting to fall in communities or census divisions in the province; it simple means that the presence of casinos was statistically associated with lower incidence rates for shoplifting. One causal explanation for the relationship between casinos and shoplifting is that shoplifting has a “thrill” component and, following the introduction of casinos, individuals who would have satisfied this desire for a “thrill” by shoplifting instead satisfy it by gambling in casinos. Another explanation for the observed negative statistical relationship between casinos and crime is that the regression model is mis-specified. We could omit important variables that affect the incident rate of crime and happen to be correlated with the presence of casinos. Alternatively, the regression model may fail to adequately account for the clear downward secular trend in shoplifting in Alberta after 1990 visible on Figure 9.1.

In summary, the statistical analysis of historical crime incidence rates and casinos in the province provides evidence that prior introduction of casinos was associated with increases in certain crime incidence rates and decreases in other crime incidence rates. The incidence rates of both robbery and prostitution increased slightly following the introduction of casinos, while the incidence rate



of all types of shoplifting declined. The incidence rate of all other types of crime examined had no statistical association with the introduction of casinos in the province.

Finally, the population surveys conducted in 2008 and 2009 contained a question about the relationship between gambling and crime: “In the past 12 months, has your gambling been a factor in your committing a crime?” More than 15,000 Albertans were surveyed in these two years; only 5 answered “yes” to this question. While these surveys are not a census of all Albertans, and many people may feel uncomfortable reporting the commission of a crime in a survey, leading to a downward bias in reported rates of crime commission, the extremely low response rate supports the general conclusion that crime and gambling are only weakly related in Alberta.

### 9.3 Summary

This section examines the impact that gambling has on crime in the province. We use data from the UCR survey and examine the impact that casinos and VLTs have on the certain types of crime. Our analysis shows that there is not any statistical relationship between these gambling mediums and crime. Our own population survey asked participants whether gambling was a factor in the participant committing a crime. The results from this question reiterated what we found with the UCR data.

Future research in this area can further examine specific jurisdictions that open new gambling venues to see whether or not the opening of a venue causes an increase in crime. Another area is examination for First Nation casinos. Generally, these casinos are located around people who are not as wealthy as the general population. Future research could examine the impact that First Nations casinos have on crime in that region. Finally, one could examine the presence of casinos and how that affects people’s insurance rates. Even though casinos may not be linked to an increase in crime, if the perception exists that casinos cause an increase in crime, that could be reflected in the insurance rates of citizens living around the casino, all other factors equal. Examining this perception would add to an already extensive literature in the area of gambling and crime.

### 9.4 Conclusions

A number of potential benefits can be associated with legal gambling, including reductions in illegal gambling attributable to increased availability of legal gambling opportunities, decreased gambling-related crime like embezzlement and fraud attributable to increased availability of legal gambling opportunities, and decreased judiciary and policing costs. A number of potential costs can also be associated with legal gambling, including violent and non-violent crimes attributable



to gambling, negative economic impacts from crime including losses to businesses from gambling related theft fraud, loan sharking, etc., increased public judiciary and policing costs attributable to gambling, and additional private security costs attributable to gambling. Policing and public safety are important services provided by the government, and the relationship between gambling and crime will also provide information about the cost of gambling in this impact domain

We used data from the Statistics Canada Uniform Crime Reporting Survey (UCRS) to analyze the relationship between gambling and crime. We examined the relationship between incidence rates for nine types of crimes in 78 Alberta communities and the opening of casinos in Alberta and the introduction of VLTs in bars and lounges. We offer the following conclusions about the impact of gambling on crime.

The regression results indicate little relationship between the presence of VLTs and crime in communities in Alberta since the introduction of VLTs in the early 1990s. There was no statistical association between the number of VLTs in communities and breaking and entering, drug possession, illegal gambling, fraud, and robbery. Credit card fraud was slightly higher in communities with VLTs, but the effect was small, since 100 additional VLTs were associated with an increase of between 1 and 11 credit card frauds per 100,000 population.

There is no association between the number of VLTs in communities and breaking and entering, drug possession, illegal gambling, fraud and robbery. Credit card fraud is slightly higher in communities with VLTs; in contrast, prostitution and shoplifting is somewhat lower. However, it is important to note there is no causal link implied; rather, there is merely a correlation between lower rates for these latter two crimes and the higher presence of VLTs. Furthermore, we acknowledge that a number of other factors may account for this relationship, including: important variables affecting crime incidence may be omitted from the model; the downward trend in prostitution and shoplifting after 1990; and VLTs may have been placed by chance in communities with relatively low incidence of prostitution and shop lifting.

The association between the presence of VLTs and prostitution and shoplifting was negative. The incident rate of these crimes tended to decline slightly after VLTs were introduced to communities. It is important to keep in mind these estimates are not causal, so the results do not mean introducing VLTs caused the incidence rate of these crimes to fall in communities.

There was no association between the opening of casinos in communities and local crime incidence for breaking/entering, credit card fraud, drug possession, illegal gambling, and prostitution. There is a slight increase in the local incidence of robbery and, in contrast, a slight decrease in shoplifting under \$5,000. As with the relationship between VLTs and crime incidence, these data are correlational and must be interpreted with caution.

The local effect assumes the effect of a casino on crime does not extend beyond the local community. The multiple regression results indicate little statistical association between casinos

and crime. The annual incidence of robberies increases by between 2 and 17 per 100,000 population, and the annual incidence of shoplifting under \$5,000 declines by between 7 and 124. The annual incidence of other crimes has no statistical association with the presence of casinos in the local community.

The statistical association between casinos and crime at the census division level in Alberta shows little evidence of a statistical relationship between casinos and crime at the regional level in Alberta. There was a small positive association between casinos and incidents of prostitution, and a small negative association between casinos and shoplifting.

Given that casinos have a regional appeal beyond the local community, we examined the relationship between casinos and crime at the census division level. From this analysis we conclude that, again, there is little association between casinos and crime at the regional level in Alberta, with the exception of robberies and shoplifting as evidenced in the analysis of local crime incidence.

## 9.5 Implications

While crime is clearly a problem in many parts of Alberta, gambling does not appear to contribute much to the commission of crimes in the province. On the whole, past introduction of VLTs, changes in the number of VLTs, and the presence of casinos was not related to crime rates in communities in Alberta. In the past, VLTs were associated with slightly higher incidence rates of credit card fraud, but also with lower incidence rates of prostitution and shoplifting. Perhaps VLT play represents a substitute for “thrill” crimes like shoplifting and vice-related crimes like prostitution. The presence of casinos was associated with a slight increase in robberies and a slight decrease in shoplifting. The effect of casinos was limited to the local area, and did not appear to spill over into outlying areas of the province. Since the operation of the policing and justice system in the province can be characterized by large fixed costs, and small variable costs, the impact of gambling-related crime on government budgets was probably minimal in the past.

While an expansion of legal gambling opportunities in the province may lead to a number of negative outcomes, if the past relationship between casinos, VLTs and crime is any indication, an expansion of the number of casinos and VLTs in the province is unlikely to lead to a significant increase in crime, or policing and judicial costs. Indeed, some relatively minor crimes like shoplifting and prostitution may be less frequent in some communities after the introduction of new or additional VLTs.

## Chapter 10

# Community Impacts

### 10.1 Charitable Gaming

Gambling affects communities in Alberta in many different ways. In this section, we examine several of the most important impacts of gambling on communities. The primary community impact addressed is the distribution of gambling revenue to local charities and non-profit organizations. In Alberta, gambling activities generate significant revenues. A portion of these revenues are distributed to local nonprofit charity organizations, which, in turn, has a significant impact on the lives of Albertans.

Charitable gaming revenues allow charity and non-profit organizations to benefit from legal gambling in Alberta. Proceeds from gaming revenues are managed by the Alberta Gaming and Liquor Commission (AGLC). Charitable gambling revenues are distributed to community organizations in Alberta through two mechanisms: the Alberta Lottery Fund, and event licenses granted to individual organizations for casino, bingo and instant win gambling activities. Charitable gambling revenues generated by ticket lotteries, slot machines, keno, and VLTs are distributed to community groups through the Alberta Lottery Fund. Charitable gambling revenues generated by the operation of charity casinos, bingo halls, raffles and pull tickets are distributed to individual organizations by the granting of licenses to qualifying charitable or religious organizations that apply for licenses. Access to charitable gaming revenues requires that a charitable, religious or non-profit group apply for a license and provide volunteers from their membership to contribute labor and effort to operating charity casinos. Charitable gambling revenues generated by casino gambling are distributed to organizations through the issuance of individual casino event licences for a single event. Charitable gambling revenues generated by bingo (which are classified under “lottery schemes” in Alberta law) are distributed to organizations through the issuance of bingo licences

which typically last two years. Charitable gambling revenues generated from pull tickets and raffles are distributed to individual organizations through the issuance of licenses. Pull ticket sales and raffles must be conducted and managed by charitable or religious organizations who hold the licenses. Pull ticket licenses are generally issued for two years; raffle licenses are issued for single events.

Figure 10.1: Licenses Issued for Charitable Gambling Events

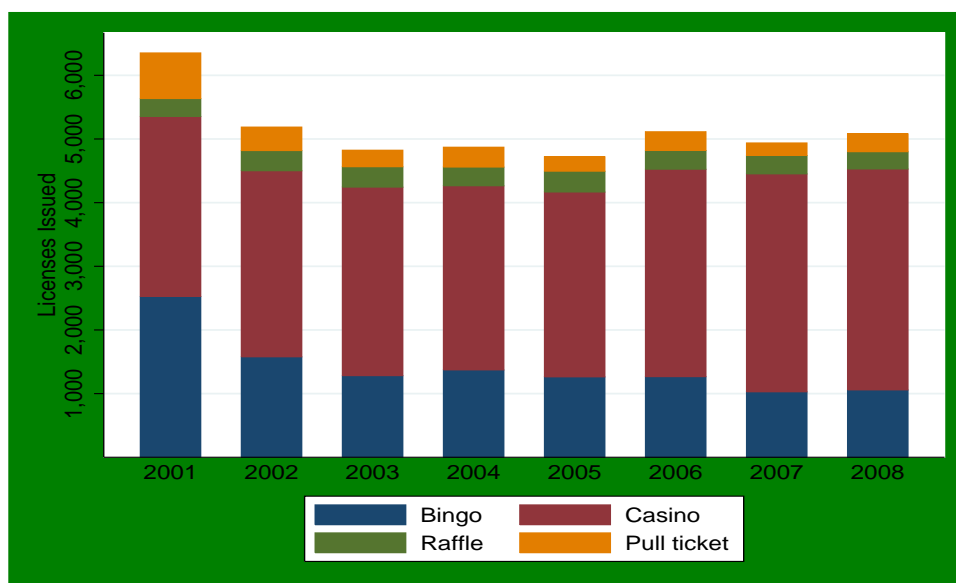


Figure 10.1 shows the number of charitable event licenses AGLC granted to charitable and religious organizations in each year from 2001 until 2008. The height of the bar shows the total number of licenses issued in each year and the colored areas show the number issues for each type of legal gambling activity. Keep in mind that more licenses exist in the province than are shown on this figure, as this figure shows new licenses issued and both bingo and pull ticket licenses generally last two years. The total number of licenses issued by AGLC was more than 6,000 in 2001 but dropped to roughly 5,000 per year thereafter. Casino event licenses make up the largest number of charitable gambling licenses issued in the province, and the number of casino event licenses issued each year increased steadily over the period. The number of raffle and pull ticket licenses are relatively small in number and make up about the same fraction of total licenses issued each year. Bingo event licenses declined dramatically over this period. In 2008 the AGLC issued fewer than half the bingo event licenses that were issued in 2001. Chapter 15 on page 233 documents the decline in bingo participation in the province over time. Similar evidence can be found in the Survey of Household Spending data discussed in Chapter 5 on Table 5.2 on page 68. This decline in bingo licenses awarded is consistent with the decline in interest in bingo in the province. As can be seen from Table 10.2 on page 177, this decline in bingo licenses was accompanied by a decline charitable gambling revenues generated by bingo, which, in turn, accounts for a decline in the

distribution of charitable gambling revenues as well. Because of this adverse effect on charitable gambling revenues, the secular decline in interest in bingo bears watching and deserves further attention.

Table 10.1 summarizes the total value of gross charitable gaming revenues, prizes paid out, expenses, and funds distributed to charitable organizations in Alberta since 1996-1997, expressed in real 2009 dollars. Proceeds to charities increased by almost 70 percent from 2000 to 2008 in inflation adjusted terms while the gross revenues, the amount wagered on charitable gambling, only increased by about 22.5 percent over that same time period.<sup>1</sup> The expenses represent the portion of revenue generated that are retained by charitable casinos and bingo halls to cover operating costs, including labour, capital costs, and overhead, incurred during the operation of charitable gaming events.

Table 10.1: Charitable Gaming Operations 1997-2009 (2009 dollars)

Year	Gross Revenues	Prizes	Expenses	Proceeds to Charity
1997	1,006,547,919	733,688,727	138,112,694	138,138,004
1998	1,150,138,499	848,858,019	152,095,614	162,936,674
1999	1,203,867,308	896,478,565	154,638,264	182,622,549
2000	1,194,951,193	889,975,656	152,407,424	197,464,717
2001	1,184,220,125	867,013,961	164,295,008	214,220,431
2002	1,209,852,039	887,533,480	170,119,659	228,915,538
2003	1,164,653,188	847,613,847	177,469,118	228,969,148
2004	1,141,116,533	817,679,208	182,875,015	246,918,256
2005	1,151,032,964	823,342,172	190,867,318	254,405,294
2006	1,177,745,369	866,646,578	177,701,682	264,399,265
2007	1,248,549,322	930,963,627	189,895,797	277,464,639
2008	1,404,915,202	1,051,161,530	206,078,413	326,040,999
2009	1,462,732,000	1,097,908,000	211,320,000	335,193,000

*Source: AGLC Charitable Gaming Annual Reports 1999-2009*

Gross revenues, prizes, expenses and charity disbursements all increased in inflation adjusted terms over the past decade. The increase in gross revenues and charity disbursements suggests that charity casino gambling is growing in popularity and providing increasing benefits to charitable organizations in the province. Prizes as a percent of gross revenues averaged roughly 75% over the period. Expenses amounted to between 13% and 17% of gross revenues over the period. Expenses as a percent of gross revenues were highest in the mid 2000s, topping out at 17% in 2005 and declining to 14% in 2009.

<sup>1</sup>If one subtracts the Gross Revenues from Prizes, Expenses, and proceeds to charity, the number does not equal to zero. The difference is the commission paid to charities and proceeds from electronic bingo and keno that is distributed through the Alberta Lottery Fund.

Table 10.2 summarizes the total net charitable gaming revenues generated by each type of charitable gambling allowed in the province over the period 1996-2008, expressed in real 2008 dollars. The net value of charitable gaming proceeds in Alberta—which represents the portion of net revenues made available to charitable and non-profit organizations in Alberta—is shown in the final column. The net amount generated by each charitable gambling type increased in inflation adjusted terms over the period, with the exception of bingo. The net value of charitable gaming proceeds distributed increased steadily and surpassed \$330 million in 2007. Under the Alberta charitable gaming model, charitable gaming revenue is drawn from four charitable gaming types: casinos, bingos, raffles and pull tickets (see Table 10.2). The revenues generated are dominated by the contribution of charitable casinos, which has been growing steadily throughout the sample time period. Bingo, on the other hand, has shown a steady and dramatic decline as the share of total charitable revenues generated by bingo is dwarfed by the funds generated by charity casinos. An analysis of how the proceeds by each of these types of charitable gambling varies by geography, including cities and census divisions, can be found in Chapter 19 beginning on page 257.

Table 10.2: Net Charitable Gaming Proceeds, by Year and Game Type (2008 dollars)

Year	Bingo	Casino	Pull Ticket	Raffle	Total
1996	\$70,960,000	\$35,750,000	\$10,900,000	\$22,500,000	\$140,100,000
1997	\$73,540,000	\$55,490,000	\$11,470,000	\$23,630,000	\$164,130,000
1998	\$73,770,000	\$73,030,000	\$11,910,000	\$27,620,000	\$186,330,000
1999	\$67,260,000	\$94,110,000	\$10,370,000	\$30,520,000	\$202,250,000
2000	\$60,050,000	\$118,560,000	\$9,990,000	\$30,430,000	\$219,020,000
2001	\$58,800,000	\$133,460,000	\$11,390,000	\$29,800,000	\$233,450,000
2002	\$52,770,000	\$138,540,000	\$9,580,000	\$33,870,000	\$234,760,000
2003	\$49,200,000	\$147,100,000	\$10,840,000	\$43,680,000	\$250,820,000
2004	\$44,290,000	\$160,350,000	\$9,030,000	\$45,650,000	\$259,310,000
2005	\$36,830,000	\$183,440,000	\$7,690,000	\$36,810,000	\$264,770,000
2006	\$31,490,000	\$207,270,000	\$7,920,000	\$36,140,000	\$282,830,000
2007	\$26,560,000	\$249,580,000	\$7,670,000	\$48,950,000	\$332,770,000
2008	\$15,110,000	\$252,390,000	\$14,810,000	\$52,700,000	\$335,010,000
Total	\$660,610,000	\$1,849,070,000	\$133,570,000	\$462,290,000	\$3,105,550,000

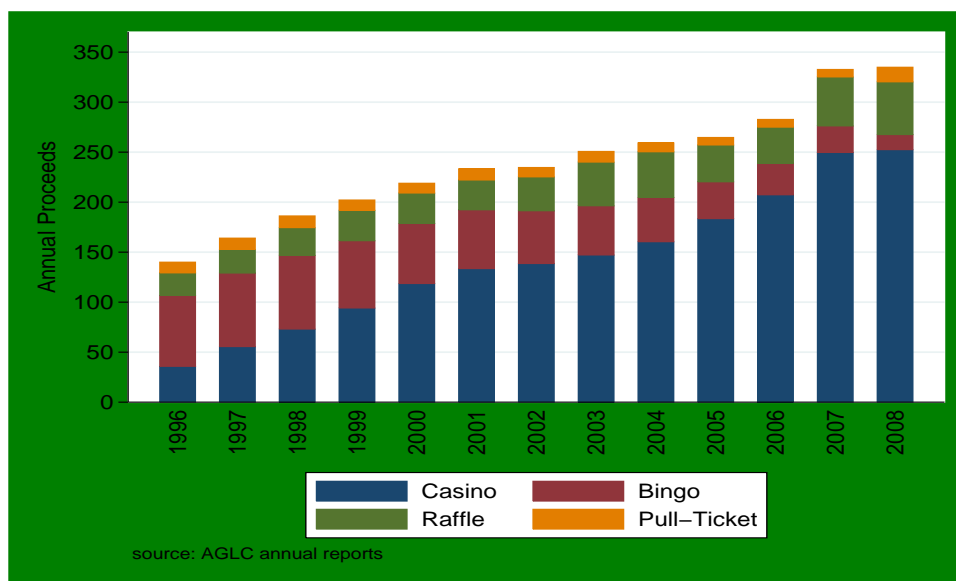
*Source: AGLC Annual Reports 1996-2008*

The final row on Table 10.2 shows the total net value of charitable gambling revenues generated by each type of gambling over the entire 1996-2008 period. Over three billion dollars in charitable gambling revenues were distributed to charitable organizations in the province over the period. That represents nearly \$100 per person in the province over the period, or an average of about \$7.50 per person in the province per year in inflation adjusted terms. To put this in perspective, the provincial government spent about \$27 per person on regional planning and development in 2009. The \$7.50 per person per year from gambling goes directly to charitable organizations, which

should have a noticeable impact on the lives of many Albertans, particularly those in need who rely on charitable organizations for help.

Figure 10.2 summarizes the charitable revenues generated by specific types of charitable gaming graphically. The decline in charitable gaming revenues from bingo, the rapid increase in revenues from casino gambling, and the smaller but still important increase in revenues from raffles can be clearly seen on this figure. Again, revenues from casino gambling dominate, and grew at the fastest rate over the period.

Figure 10.2: Total Charitable Gaming Proceeds in Alberta



In summary, charitable gambling revenues distributed by event licences are large and have grown over time in Alberta. These funds go to a wide variety of charitable and religious organizations, and affect the lives of a large number of Albertans. Although new revenues from most types of charitable gambling have increased over time in inflation adjusted terms, bingo licenses awarded, revenues generated and revenues distributed to charitable organizations have declined significantly over the past 15 years. As long as revenues generated by other forms of charitable gambling continue to grow, this decline in charitable revenues from bingo can be offset and will not affect charitable gaming beneficiaries. However, some attention should be paid to this decline in bingo.

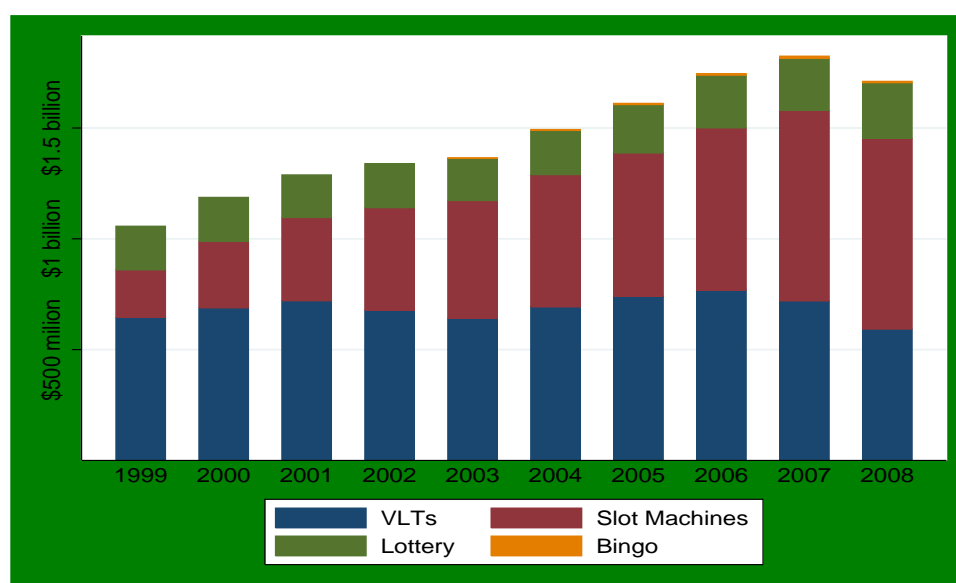
## 10.2 The Alberta Lottery Fund

The second mechanism through which charitable gambling revenue flows to charitable and non-profit organizations in communities in Alberta—as well as to other major contributions to public

infrastructure and health costs in the province—is through the Alberta Lottery Fund (ALF). The ALF draws revenues from slot machines and video lottery terminals (VLTs), as well as provincial ticket lotteries. Annual gambling revenues flowing into the ALF from slot machine revenues, VLT revenues, and lottery ticket sales are substantial, exceeding \$1.5 billion per year in recent years. The ALF distributes these charitable gambling revenues across the province, funding a large number of community-based, volunteer, and public initiatives.

The funds flowing into the ALF come from slot machine revenues, which are located in casinos and racing entertainment centres, revenues from VLTs in pubs and bars, lottery tickets sold in lottery ticket centres, and electronic bingo. These sources of funds include the two major forms of electronic gaming machines (EGMs) in the province, VLTs and slot machines. Figure 10.3 shows the annual gambling revenues flowing into the ALF and the composition of these revenues, in terms of the four sources of ALF funds: VLT, lottery ticket sales, slot machines and electronic bingo. From Figure 10.3, VLTs are the most important source of ALF funds in the province, although slot machine revenues are increasing as a fraction and in absolute terms over time, and drive most of the growth in ALF funds over the period. While the sale of lottery tickets contributed over half a billion dollars to the ALF, this source of revenues is much smaller than EGMs, and the contribution of electronic bingo is tiny compared to revenues generated by EGMs—the share of electronic bingo revenues is shown on the graph, but is so small that it is not visible to the naked eye. These funds are generated by gambling participation in three different games. Section 11.2.4 on page 201 describes the demographic characteristics of slot machine players. Section 12.6 on page 210 describes the demographic characteristics of VLT machine players. Section 13.5 on page 220 describes the demographic characteristics of lottery players.

Figure 10.3: Sources of ALF Funds





The Alberta Lottery Fund web site provides an extensive amount of data regarding the awarding of grants and the dollar amounts awarded in ALF grants.<sup>2</sup> Based on this information, one can examine grants awarded by the Alberta Lottery Fund for the entire province, grants awarded by one of the 19 government agencies listed as benefitting from the fund, and grants awarded to individual communities in the province. The time period available runs from fiscal year 1998-1999 through fiscal year 2009-2010. These data come with the following disclaimer on the web site:

“Records may contain grant information with conditional funding requirements. In some cases, grants may be reported as being awarded even though final delivery is subject to funding conditions being met. The information contained in this section has been gathered from the various funding programs and foundations. Although efforts have been made to ensure its accuracy, the listing may not be 100% complete and this information should be used accordingly (n.p).”

We believe that this data represents the best available, most comprehensive source of information about the impact of charitable gambling revenues on communities and organizations throughout the province. We collected all the data available on the web site about the distribution of gambling revenues to charities and non-profit organizations by the Alberta Lottery Fund.

Table 10.3: Annual Alberta Lottery Fund Revenues and Grant Activity

FY	Grants Awarded	ALF Grant Dollars Awarded	Gambling Dollars Transferred to ALF	Grant \$s as % of Gambling Dollars
1998	8,661	402,369,316	956,808,414	42%
1999	7,708	262,663,326	1,107,092,314	24%
2000	7,454	285,864,429	1,087,549,714	26%
2001	6,962	198,733,542	1,234,524,183	16%
2002	4,433	166,567,995	1,339,646,850	12%
2003	4,846	204,876,466	1,256,461,293	16%
2004	5,341	273,537,918	1,301,516,261	21%
2005	5,047	351,279,991	1,403,266,554	25%
2006	4,704	232,683,860	1,479,910,031	16%
2007	4,937	464,993,588	1,564,098,664	30%
2008	6,326	427,112,467	1,610,702,319	27%
2009	5,770	252,990,000	1,512,153,000	17%
Total	68,633	3,523,672,897	15,853,729,597	23%

We summarize the ALF data in three forms. The first aggregates the value of all ALF grants to the provincial level. Table 10.3 summarizes the revenues flowing to ALF and the value of specific

<sup>2</sup>[http://albertalotteryfund.ca/who\\_benefits/](http://albertalotteryfund.ca/who_benefits/).

grants awarded from the ALF over the period 1998 to 2009. The dollar values on Table 10.3 are expressed in real 2009 dollars. Table 10.3 shows that communities in Alberta have benefitted significantly and directly from ALF grants over this period. More than 68,000 ALF grants were awarded over this period with an average of 5,821 grants per year. The total amount awarded was more than \$3.5 billion with the average dollar amount distributed per year was \$279 million in inflation adjusted terms. More than \$15.8 billion dollars in revenues derived from bingo, VLTs, and ticket lottery sales in the province flowed into the ALF over this period in real terms. Figure 10.4 shows the total number of ALF grants awarded in each year throughout the province. About 23% of those dollars were paid out directly to communities in the form of ALF grants. The rest went into provincial coffers to fund other government provided goods and services. For instance, according to the AGLC Annual Report (2009a), over \$260 million was transferred to the Ministry of Health and Wellness (and almost \$200 million to Transportation, among many other ministries). To put these amounts in context, the transfer from ALF represents 2% of the Ministry of Health and Wellness' proposed budget of \$12.9 billion for 2009-2010. Albertans thus benefit both directly, through ALF grants, and indirectly, through ALF contributions to fund government programs, from the gambling revenues handled by the ALF. Table 5.14 on page 92 places ALF revenues in the context of provincial government revenues. From Table 5.14, the ALF revenues represent about 4% of own source provincial revenues in Alberta. ALF revenues represent a growing share of provincial own source revenues in the province.

Figure 10.4: ALF Grants and Grant Dollars Awarded

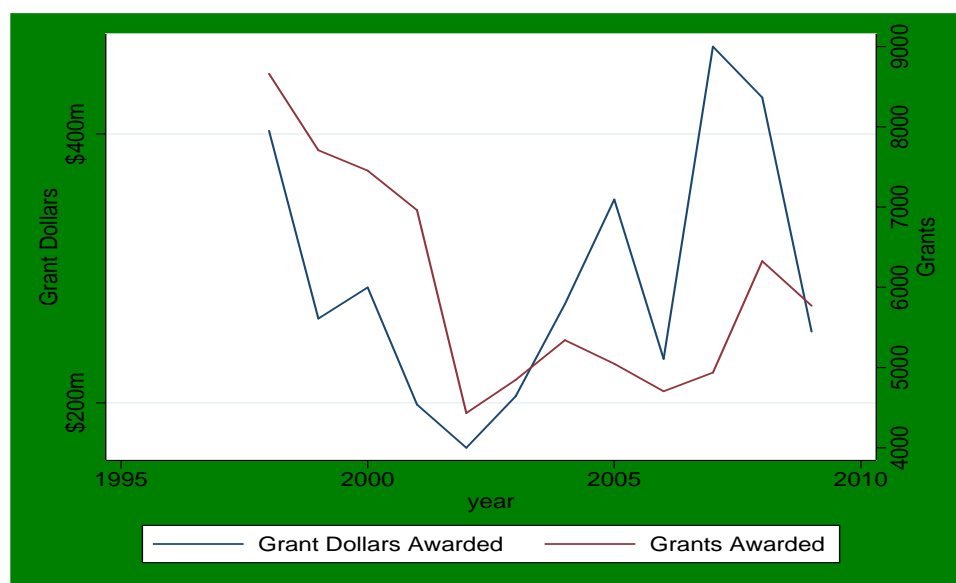


Figure 10.4 shows the real grant dollars awarded and the number of grants awarded by the ALF each year. Note that the number and dollar values of ALF grants tend to move together, but that the relationship has become less clear in the last few years. This suggests that the average dollars

per ALF grant fluctuate widely over time. From Figure 10.4 the number of ALF grants awarded decreased steadily over the period. The number of grants awarded per year was relatively stable from 2002 to 2006. Since we do not know how many applications were made to the ALF, we cannot determine if this can be attributed to a decline in applications for ALF funds, or a policy of making fewer awards per year.

Figure 10.4 shows the total dollar value of grants awarded by the ALF, in real 2008 dollars. The total dollar value of grants awarded declined somewhat in inflation adjusted terms from 1998 through 2002, and increased thereafter. Total distributions of ALF grants were in the \$300 to \$400 million per year in the late 2000s. From Figure 10.4 the decrease in the number of grants awarded does not mean that less money was distributed by the ALF. Indeed, as the number of grants awarded declined, the total dollar value awarded increased, indicating that the average value of each award increased over the period. Note that for fiscal year 2009-2010, the value of ALF grants awarded appears to decline. This decline should be interpreted carefully, as ALF web site may not be updated to reflect the total amount of ALF funds awarded in fiscal year 2009-2010 at the time of this writing.

The second approach to examine data about grants made from the Alberta Lottery Fund is to look at grants distributed by funding agency. The 19 funding agencies that made grants using ALF funds are listed on the ALF website. Table 10.4 contains the names of these 19 agencies and the number of grants using ALF money made by each during the 1998-2009 period, the number of years each made grants using ALF funds, and the total number of grants awarded by each agency. Agricultural Support Initiatives, the Alberta Foundation for the Arts, the Alberta Historical Resources Foundation, the Alberta Museums Association, the Alberta Sport, Recreation, Parks and Wildlife Foundation, the Community Facility Enhancement Program, the Human Rights, Citizenship (and Multiculturalism) Education Fund, the Community Lottery Board, and the Major Fairs and Exhibitions Initiatives and the Wild Rose Foundation made the most ALF grants over this period. Note that the Community Lottery Board was only awarding ALF grants for 4 years during the period.

We combined the 19 ALF grant awarding agencies listed above into 6 broad categories based on mission and type of grant made. These six categories are: agriculture, community development, culture, First Nations, leisure and health, and other. The construction of the categories was based on the titles of the agencies and the characteristics of the grants and their grantees. Table 10.5 summarizes the mapping of agencies into these six categories. Below we provide some examples of each of these agencies and the organizations they award ALF grants to.

The agriculture category contains only one agency, the Agriculture Support Initiatives provides money to agricultural societies in Alberta. For example in 1998-1999, the agency granted \$12,500 (in nominal terms) to the Highridge and District Agriculture Society. Unlike other agencies on the list, Agriculture Support Initiatives agency does not disclose what the money was spent on.

Table 10.4: Name and Activity of Agencies Distributing ALF Grants

Agency	Number of ALF Grants	Number of Years Making ALF Grants
Agricultural Support Initiatives	8,645	12
Alberta Foundation for the Arts	15,985	12
Alberta Historical Resources Foundation	1,619	12
Alberta Museums Association	2,651	11
Alberta Sport, Recreation, Parks and Wildlife Found.	4,312	12
Centennial Legacies Program	518	6
Community Facility Enhancement Program	6,819	12
Community Initiatives Program	8,431	8
Community Lottery Board	15,156	4
Community Spirit Donation Grant Program	1,494	1
First Nations Development Fund	921	4
Health and Wellness Initiatives	21	2
Human Rights Education Fund	7	1
Human Rights, Citizenship Education Fund	409	12
Major Community Facilities Program IX	232	2
Major Fairs and Exhibitions Initiatives	209	12
Other Initiative Programs	420	12
Other Lottery Funding	254	9
Wild Rose Foundation	1,752	12

The community development category contains agencies that improve communities in some way. Three of the five agencies in this category help build, renovate, and enhance community facilities or help fund fairs, conventions, and exhibitions. For example, the major fairs and exhibitions initiatives helps fund the Calgary Stampede, events in Edmonton at Northlands, and fairs and exhibitions in other communities such as Grande Prairie, Medicine Hat, and Olds. The two other agencies in this category, Community Lottery Board and Community Initiatives Program, provide funding for infrastructure in communities. For example, in 2008-2009 the initiative provided \$3,193 to the community of Alix for upgrades to their community hall. It also provided almost \$18,000 dollars to Alliance for upgrading baseball diamonds in that community. The agency also provides money for communities to host events. For example in the same year, the agency awarded \$11,500 to the Bawlf Education Support Team Foundation to host the 2007 High School 2A men's provincial volleyball championships. The Community Lottery Board existed from 1998-1999 through 2001-2002. According to Appendix A.1, the Lottery Board was discontinued in 2002 and was replaced by the Community Initiatives Program. While in existence, the Lottery Board Agency provided funding similar to the Community Initiatives Program.

The culture category contains six agencies. The first, the Alberta Historical Resources Foundation, provides funding to individuals in communities for various historical places and projects. For

Table 10.5: Composition of ALF Granting Agency Categories

<b>Agriculture</b>	<b>Community Development</b>	<b>Culture</b>
* Agricultural Support Initiatives	*Community Facility Enhancement Program *Community Initiatives Program *Major Community Facilities Program IX *Major Fairs and Exhibitions Initiatives	*Alberta Historical Resources Foundation *Centennial Legacies Program *Community Spirit Donation Grant Program *Human Rights Education and Multiculturalism Fund *Human Rights, Citizenship and Multiculturalism Education Fund *Wild Rose Foundation
<b>First Nations</b> First Nations Development Fund	<b>Leisure &amp; Health</b> *Alberta Foundation for the Arts *Alberta Museums Association *Alberta Sport, Recreation, Parks and Wildlife Foundation *Health and Wellness Initiatives	<b>Other</b> *Other Initiative Programs *Other Lottery Funding

example, in 2009-2010, the agency provided almost \$29,000 dollars to the Museum of the Highwood in High River for conserving the Canadian Pacific Railway Station there. The Centennial Legacies Program began in 2000-2001 and operated through 2006-2007. Like other agencies in this category, they provided funding for communities but focused more on the beautification and enhancement of the community and its citizens. For example, in 2004-2005, the program awarded \$3,000 to Argentinia Beach to purchase permanent park benches. During that same year, the program granted \$50,000 to the city of Calgary for a police officers and fire fighters tribute plaza. The Community Spirit Donation Grant Program began in fiscal year 2008-2009 and has given out more than 3,200 grants since its inception. In 2009-2010 they awarded nearly \$5,000 to the Airdrie Boys and Girls Clubs for operations. They also award money to capital projects and programs from different charities in the communities. The fourth and fifth agencies deal with human rights education and multiculturalism. An example of a grant made by these agencies is \$20,000 to the Fort Macleod Kids First Family Centre to build capacity for youth leadership. According to the notes provided in the database, the program brings together aboriginal and non-aboriginal youths. The final agency in the culture category is the Wild Rose Foundation. The Wild Rose Foundation provides funding for a variety of cultural activities. Some items include guide dog services, mental health associations, employment counseling services, and fire departments.

The First Nations category includes the First Nations Development Fund. This fund began in fiscal year 2006-2007. The money awarded from this fund goes to various projects on First Nation reserves. Some examples include sports and recreation, infrastructure, and training and development grants.

The leisure and health category includes four different agencies. The first, the Alberta Foundation for the Arts, provides funding for education in the arts and for various artistic performances throughout the province. For example, in 2004-2005, the group awarded almost \$3,800 to the

Athabasca Country Fringe Festival Society for an arts festival. The second agency is the Alberta Museums Association. Many of the awards given by the association go to the operations of facilities. However, money does go to other projects throughout the province. For example, in 2004-2005 the association awarded Lac La Biche Mission Historical Society over 4,600 dollars towards collections inventory and preservation. The third agency is the Alberta Sport, Recreation, Parks and Wildlife Foundation. During the time period, the foundation has given out over 4,000 grants for purchasing of equipment, renovating and building sport infrastructure, and for athletes to travel to competitions. The final agency is Health and Wellness Initiatives which ended after the 2000-2001 fiscal year. During the two years of data from the ALF website, the agency awarded 21 grants. The grants went to purchasing equipment for various health centres around the province. For example, in 1999-2000 the Lakeland Regional Health Authority received 200,000 dollars to purchase ultrasound equipment for St. Joseph's Hospital.

The final category is a residual category called "other." The two agencies in this category are Other Initiatives Program and Other Lottery Funding. In examining the two agencies that compose the category, we could not find a consistent funding theme that could place the agencies into our other categories. These two programs awarded close to 700 grants during the sample time period to an amount of approximately 487 million nominal dollars. These dollars are funded to purchase equipment, host events, build infrastructure, and for problem gambling programs. For example, the other lottery funding agency awarded almost 28 million dollars to the province in 1999-2000 for problem gambling program costs.

After grouping the agencies into these six categories, we examine the number of grants distributed by agency category and the total dollar amount of grants awarded in each category over the 1998 to 2009 period.

Figure 10.5 shows the number of grants awarded by agencies in each category by year. Notice from Figure 10.5 that the number of grants in the Agriculture and Leisure and Health categories remain constant over the period and the number of grants made in the community development category, while large in the early part of the sample period, vary in number quite a bit year-to-year and declined steadily over time. A relatively large number of grants in the community development category were made in 1998, 1999, 2000 and 2001. The number of grants made in the community development declined markedly in 2002 and continued to decline thereafter. The reduced number of ALF grants in the community development category explains why the total number of ALF grants declined over the period. The number of grants made in the culture category, the First Nations category, and the other category were relatively small in number compared to the number of grants in the community and leisure/health category. An unusually large number of grants were made in the culture category in 2008, which explains why the total number of grants awarded increased in that year.

Figure 10.5: Number of ALF Grants Awarded by Agency Category

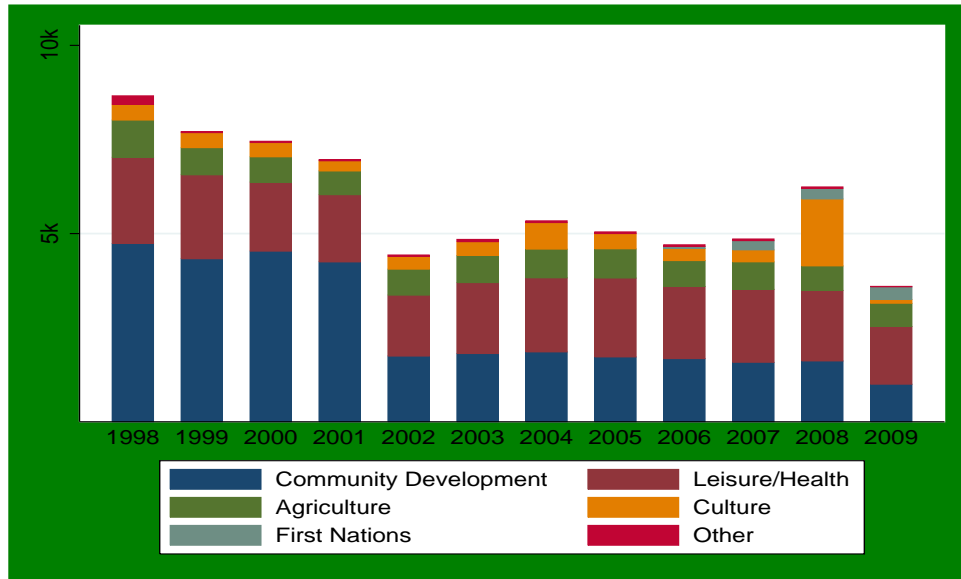
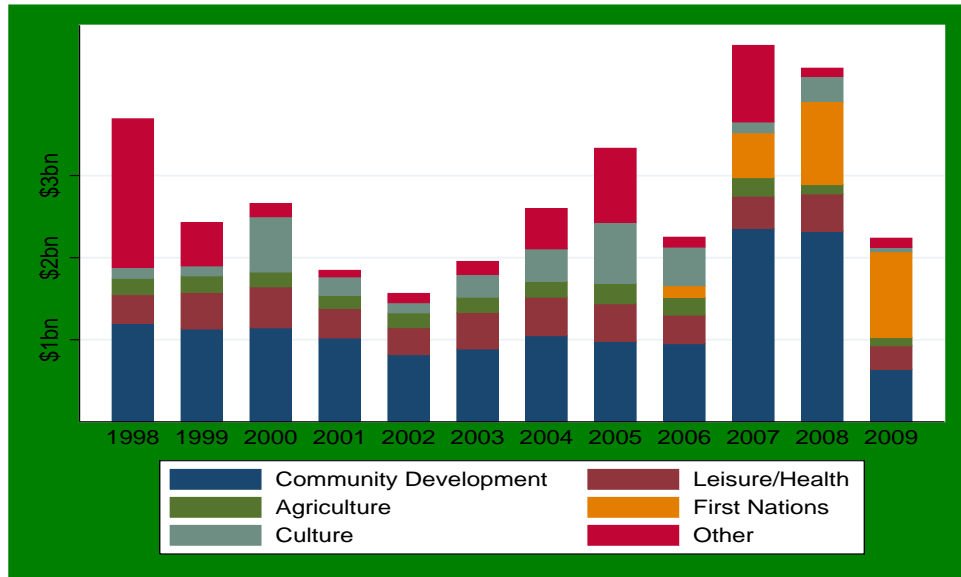


Figure 10.6 shows the composition of dollars of ALF grants awarded in each category over the period 1998-2009. Figure 10.6 contains some interesting features. Like Figure 10.5, the agriculture category awarded a relatively constant number of dollars in grants in each year. The community development category awards the largest number of dollars of grants in each year, although the dollar values vary year-to-year. One reason for this large share could be the relatively large number of agencies in the community development category. One could attempt to control for that by constructing an average value of grants per agency, but that would be distorted by the presence of agencies that give a few large grants each year. Therefore, we believe that this presentation is the best. One also notices the expansion of grant dollars awarded in the First Nations category since they were instituted in fiscal year 2006-2007. Note that the increase in ALF grant dollars since 2002 can be attributed to increased in the grant dollars awarded in the culture, other, community development and First Nations categories, but the increase is not uniform across categories.

Funds from the ALF also go directly to specific government ministries in Alberta. These funds support a wide array of provincial government services and programs. Appendix C contains a detailed list of the amount of funds allocated from the ALF to specific ministries in 2009-2010. Ministries receiving ALF funds in 2009-2010 included: Aboriginal Relations, Advanced Education and Technology, Agriculture and Rural Development, Children and Youth Services, Culture and Community Spirit, Education, Employment and Immigration, Environment, Health and Wellness, Municipal Affairs, the Solicitor General and Public Security (for the operation of the Alberta Gaming Research Institute, which funded this research), Tourism, Parks and Recreation, and Transportation.

Figure 10.6: Distribution of ALF Grant Dollars Awarded by Agency Category



### 10.3 Summary

The chapter examines the impact of charitable proceeds from gambling on individuals, non-profit groups, and communities in Alberta. These groups have access to two streams of charitable gambling revenues: the Alberta Lottery Fund and charitable gaming licenses. The data that we examined on the distribution of ALF grants were based on six agency categories. We document the number of grants awarded in each category and the total dollar amount of grants awarded in each category. We see from this chapter that gambling has many positive impacts on charitable and religious organizations in all aspects of life in Alberta. This is also shown in a broader framework with Appendix C that examines the estimated allocation of ALF fund money in 2009-2010 to various aspects of Alberta life. We analyze the geographical distribution of ALF grant money in Chapter IV, beginning on page 275.

This chapter is not without limitations and from those limitations come ideas for future research in this area. This chapter does not examine characteristics of the individual charities and non-profit groups that receive individual licenses for charity gaming, nor does it examine the direct impact of charitable gaming money on these organizations and how these funds affect these organizations. A thorough analysis of these topics would be a useful extension of this research. In addition, future research should identify non-profit organizations that do not take gambling money and explore their views on the charitable gaming model used in Alberta, among other things. The ALF database contains a wealth of information on individual grant awards and the organizations that receive them. Future research could also examine the categories of grants that money from the ALF is awarded to and perform a more detailed analysis of the impact in specific sectors of Alberta.



## 10.4 Conclusions

Communities in Alberta benefit directly from gambling through the distribution of revenues directly to local charities and non-profit organizations in two main ways. First, these community-based organizations gain a share of gambling profits under the province's "charitable model" through which groups are granted licenses for certain types of gambling activities, including casinos, bingos, pull-tickets and raffles. The most lucrative is the Alberta Gaming and Liquor Commission's (AGLC) granting of a "charitable casino license" to a community organization. This license requires that the organization provide volunteers to assist in an established casino's operations for a two-day period, after which the group is given a share of the profit for those days (this typically ranges from \$40,000 to \$80,000). The second way community groups benefit from gambling revenues is through the Alberta Lottery Fund (ALF). The ALF draws revenues from slot machines, VLTs, and lottery ticket sales and distributes these funds to (a) community-based organizations and public initiatives, and (b) the general revenue pool of the Alberta government. An analysis of the distribution of gambling revenues from these two sources helps determine the impact of gambling on Alberta communities and the following conclusions are proffered:

- The charitable gambling model in Alberta has resulted in a significant amount of funding being given directly to community organizations over the past dozen years. In 2009, over \$335 million from charitable gaming proceeds has been advanced to organizations, non-profit societies and other public goods in Alberta communities. In total, from 1996 to 2008, over \$3 billion has been advanced to communities, with the largest percentage coming from charitable casinos (60%), followed bingos (21%), raffles (15%) and pull tickets (4%). This contribution to community groups is even more impressive given that gross revenues for charitable gaming have only increased 14% from 1996 to 2008, and yet the contribution to community-based organizations has risen 58% during this time period.
- The total number of charitable gaming licenses issued by AGLC for casinos, bingo, raffle, and pull tickets has declined from over 6000 in 2001 to about 5000 per year thereafter. During this time period, the number of bingo licenses issued dropped dramatically, from 2,500 to about 1,000 while the number of casino licenses increased, with raffle and pull ticket license issuance remaining relatively unchanged. There is a corresponding increase in total revenues for casino licenses during this same time period—from \$133 million in 2001 to \$252 million in 2008 (190%). In contrast, bingo revenues to community groups plummeted from \$59 million in 2001 to \$15 million in 2008 (393%). It may be concluded that while community groups continue to benefit greatly from participation in charitable casinos, there is a significant decrease in revenues coming from bingos, which have provided a long-standing, traditional source of funding in Alberta communities.

From 1998 to 2009, the Alberta Lottery Fund (ALF) has contributed over \$3 billion in grant funding to Alberta communities through direct funding to charitable organizations, non-profit societies, and other municipal groups. During this same time period, the ALF also remitted an additional \$11 billion directly to the provincial treasury to fund government operations. It must be concluded that the ALF is not only an extremely important source of revenue to community groups throughout Alberta, but also a significant source of revenue that contributes directly to financing the operations of various ministries in the provincial government.

It is interesting to track the types of community organizations that have received ALF funding over the years and one way of doing this is to examine the granting practices of the 19 affiliated agencies that are used as ALF's agents for disbursing gambling revenues for various types of community projects. We have categorized these agencies into six types: agriculture, community development, culture, First Nations, leisure and health, and other. An analysis of the number of grants given and the total annual revenue amounts within these six categories leads to the following conclusions:

- Between 1998 and 2001, the largest number of ALF grants was given to community development projects. From 2002 to 2009, the number of grants for community development projects decreased by about half, while grants to leisure and health and, to a lesser extent culture, increased slightly.
- The largest number of grants and, correspondingly, the most ALF grant revenue is given to community development groups for projects such as community facility enhancement, community initiatives, major community facilities, and major fairs and exhibitions.
- Although the number of grants for community development projects decreased in recent years, this category still receives the greatest proportion of funding each year.
- While leisure and health groups have the next largest number of ALF grants year-over-year, the total revenue for these groups is sometimes eclipsed by funding for cultural projects, other projects and, since 2007, for First Nation projects.
- While a significant number of grants are given each year for agricultural support initiatives, the total ALF funding for these initiatives is typically lower than that for the other five categories.
- Since ALF funding through the First Nation Development Fund (FNDF) began in 2006, both funding requests and the total amount of funding for various Aboriginal community projects have risen steadily. In 2009, about 40% of the total funding allocated by ALF affiliated agencies went to First Nation projects funded under the FNDF. In comparison, all other provincial community development projects received about 25% of the total grant revenue for that fiscal year.

## 10.5 Implications

Gambling revenues represent an important source of funds for charitable organizations and governments in the province. This money, in turn, generates direct and indirect benefits for Albertans in a number of ways. Some of these benefits are visible, like the renovation of a local landmark with ALF grant money, while others are indirect and less visible. Because so many of these benefits are both intangible and difficult to link directly to funds generated by legal gambling activities, the size and importance of these benefits are difficult to understand. The results in Chapter 10 suggest that these benefits are large, persistent, and important. They should not be overlooked by policy makers and tax payers in the province. Note that the opportunity cost of raising additional government funds increases the benefits flowing from legal gambling activities in the province. Gambling is a voluntary activity, and millions of Albertans willingly take part in gambling each year. Their spending generates billions of dollars that are redistributed to communities all over Alberta, both directly and indirectly. If these gambling-generated funds were not available, taxes would have to be increased to generate funds to replace them. Taxes are compulsory, and have a higher overall cost associated with collection and administration. In addition, paying a higher per litre gas tax does not generate additional happiness or reduce stress.

The revenues generated by gambling flowing into provincial coffers and redistributed through the ALF and the charitable gambling model in Alberta have grown along with the gambling industry in the province. Any future expansion of legal gambling activities in the province can be expected to generate additional funds. Of course the law of diminishing returns will eventually come into play in this process, but there is no evidence that we are near the point of diminishing returns to the generation of charitable funds from gambling in the province.

## Part III

# Impacts by Type of Gambling Activity

The previous chapters examine the impact of gambling by specific domains. This section examines gambling's impact by the type of game. Due to the difference in popularity, revenue distribution, and the distribution of the game, it is important to examine the impact by gambling activity. For the purposes of this report, we examine the impact of eight games: casinos, slot machines, video lottery terminals (VLTs), lotteries (including scratch off games), bingo, horse racing, pull tickets, and raffles. For each game (where applicable), we present a description of the game, the current supply of the game in the province, a demographic profile of people who participate from the last two years based on the population surveys<sup>3</sup>, the financial activity regarding the game<sup>4</sup>, and the current trends/issues surrounding the game.

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<sup>3</sup>The full tables comparing all the games are presented in Table 18.1 in Appendix B presents these results in detail

<sup>4</sup>Note that we do not develop estimates of total spending on each type of gambling from the population survey data, because the survey contains questions about net spending (spending plus winnings). Out of pocket expenditure on gambling cannot be estimated from these questions. See Appendix B for a detailed discussion.

# Chapter 11

## Casinos

### 11.1 Casino Gambling in Alberta

Casinos are one type of gambling activity available in Alberta. Inside casinos, gamblers can choose from a multiple types of games. Slot machines are the most widely available type of game in casinos. Casinos also offer a number of table games like blackjack, baccarat, craps, roulette, and poker. While gambling is the main focus of activities in casinos, many casinos also offer other entertainment options including concerts, comedy shows, and restaurants/bars. Finally, many casinos are attached to hotels which allow patrons to stay the night, eat on site, and gamble.

Casino gambling is an ambiguous term that can refer to either playing slot machines or table games at a casino. These are actually two separate gaming products, and the profiles of those who play slot machines differs considerably from those who play table games, so the distinction should be made clear. In the following sections we will discuss first the participation in table games as casino gambling, and second the playing of slot machines at casinos and racing entertainment centres as slot machine gambling.

In Alberta, there are two types of casinos. The first type is on First Nation reserve land. The second type is on privately owned land (also known in the AGLC annual reports as “traditional” casinos). Even though both types of casinos are similar, the majority of the revenues from casinos located on First Nations reserve land go back to the First Nations tribes while the revenues from traditional casinos gets distributed throughout the province. Table 11.1 presents a list of casinos in Alberta as well as their location, size, and the number of slot machines in each casino. The data was provided by the Alberta Gaming Research Institute.<sup>1</sup> From the web site, some sizes and slots were not available. The group attempted to find the missing information as well as when slot machines were added to the casino. However, we were not able to find any additional information to populate Table 11.1.

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<sup>1</sup>Information located at [http://www.abgaminginstitute.ualberta.ca/Alberta\\\_casinos.cfm](http://www.abgaminginstitute.ualberta.ca/Alberta\_casinos.cfm). Web site updated June 12, 2008.

Table 11.1: Casinos in Alberta by Location and Type

Facility Name	City	Size (sq ft)	# of Slot Machines	Racino	First Nation
Northern Alberta					
Great Northern Casino	Grande Prairie	30.864	392	No	No
Evergreen Park	Grande Prairie	3.000	99	Yes	No
Boomtown Casino	Fort McMurray	23.000	399	No	No
Casino Dene	Cold Lake FN	23.000	150	No	Yes
Edmonton Area					
Casino Yellowhead	Edmonton	75.000	762	No	No
Palace Casino	Edmonton	64.000	695	No	No
River Cree Resort and Casino	Enoch	65.000	600	No	Yes
Casino Edmonton	Edmonton	60.000	761	No	No
Baccarat Casino	Edmonton	35.000	328	No	No
Century Casino and Hotel	Edmonton	35.000	588	No	No
Northlands Park	Edmonton	20.000	562	Yes	No
Gold Dust Casino	Saint Albert	20.000	240	No	No
Central Alberta					
Jackpot Casino	Red Deer	26.000	299	No	No
Cash Casino	Red Deer	23.000	299	No	No
Camrose Resort Casino	Camrose	27.000	200	No	No
Eagle River Casino	Whitecourt	19.000	250	No	No
Calgary Area					
Elbow River Casino	Calgary	80.000	604	No	No
Deerfoot Inn and Casino	Calgary	60.000	671	No	No
Casino Calgary	Calgary	57.000	760	No	No
Cash Casino	Calgary	50.000	665	No	No
Frank Sisson's Silver Dollar Casino	Calgary	50.000	554	No	No
Stamperede Casino	Calgary	40.000	600	No	No
Grey Eagle Casino	Tsuu T'ina FN	84.000	600	No	Yes
Stoney Nakoda Casino	Stoney Nakoda FN	70.000	300	No	Yes
Southern Alberta					
Casino Lethbridge	Lethbridge	44.000	299	No	No
Whoop-Up-Downs	Lethbridge	15.000	99	Yes	No
Casino by Vanshaw	Medicine Hat	14.000	230	No	No

### 11.1.1 Availability of Casino Gambling

There are currently 19 traditional “charity” casinos operating in Alberta. Since 2006 they have been augmented by 5 First Nations casinos. The 2008-2009 AGLC Annual Report contains a casino breakdown for the last five years in terms of how many traditional and First Nations casinos exist. Table 11.2 presents this breakdown. During the time period, the number of casinos briefly dropped to 16 and then has increased to its current total of 24. As one can see, the number of First Nation casinos is presently at five; in 2004, there were no First Nation casinos in the province. There have been three traditional casinos added during this time period. Table 4.2 in Chapter 3 details the opening of First Nation casinos in the province.

Together, these 24 casinos have contributed over \$250 million in charitable gaming proceeds. This is the most ever, and caps a history of continuous growth. Historically, casinos have been a

Table 11.2: Number of Casinos in Alberta: 2004-2008

Type/Year	2008-2009	2007-2008	2006-2007	2005-2006	2004-2005
Traditional Casinos	19	19	18	17	16
First Nation Casinos	5	4	1	0	0
Total Casinos	24	23	19	17	16

big draw for people. To put this into perspective, Smith and Hinch (1996) found that casinos in Alberta made up 17 % of the total gambling handle in the province.

These revenues have accrued mostly to charities in the major population centres of Edmonton and Calgary, but the amount paid to Albertans outside the two largest cities has increased steadily over time. The emergence of First Nations casinos has had a considerable impact on the distribution of revenues, and seems to particularly erode Edmonton's charitable revenue sources, as can be seen by Edmonton's diminished slice of the revenue pie for 2008-2009.

### 11.1.2 Distribution of Charitable Casino Revenues

The final column on Table 11.3 summarizes the charitable proceeds generated in Alberta by casino gamblers. The values are expressed in millions of 2008 dollars. Table 11.3 also summarizes the charitable gaming revenue from different sources in the province. These data come from the AGLC Annual Reports. The locations are Calgary, Edmonton, First Nation Casinos, and all other casino locations in the province. Charitable proceeds generated by casinos grew steadily over this period in inflation adjusted terms, from about \$35 million in 1996 to more than \$250 million in 2008. In total, casinos generated more than \$1.8 billion in charitable proceeds over the period 1996 to 2008 in Alberta. Recall that, under Alberta's charitable gaming model, these funds, with the exception of the funds from First Nations casinos, are distributed to individual charitable organizations through the granting of individual licences by AGLC.

Figure 11.1 presents the data on Table 11.3 graphically, which highlights the role played by casinos in the four different locations in driving growth in charitable casino proceeds. Most of the charitable proceeds from casino gambling come from Edmonton and Calgary. The charitable casino revenues in Edmonton and Calgary both grew in inflation adjusted terms over the period, with the exception of an obvious decline of about \$21 million in Calgary from 2007 to 2008. Figure 11.1 highlights the importance of casinos opened outside Edmonton and Calgary, and on First Nations land, to the robust growth in charitable proceeds from casinos over this period. Charitable revenues from these two new sources also grew steadily in inflation adjusted terms over the period. The decline in charitable casino proceeds generated in Calgary in 2008 could be due to



Table 11.3: Charitable Revenue from Casinos by Location (millions of 2008 Dollars)

Year	Proceeds By Location				Total
	Calgary	Edmonton	First Nations	Other Areas	
1996	13.81	19.83	—	2.11	35.75
1997	25.10	26.12	—	4.27	55.49
1998	32.80	31.79	—	8.44	73.03
1999	39.73	39.71	—	14.67	94.11
2000	47.90	48.06	—	22.60	118.56
2001	51.96	55.21	—	26.30	133.46
2002	52.94	56.56	—	29.04	138.54
2003	54.73	58.56	—	33.82	147.10
2004	59.68	61.02	—	39.66	160.35
2005	75.52	64.68	—	43.24	183.44
2006	90.18	63.14	—	53.95	207.27
2007	100.69	71.61	30.41	46.87	249.58
2008	79.71	73.53	53.37	45.79	252.39

the opening of new casinos on First Nations land near Calgary, which would be the first evidence of “cannibalization” of charitable casino revenues in the province.

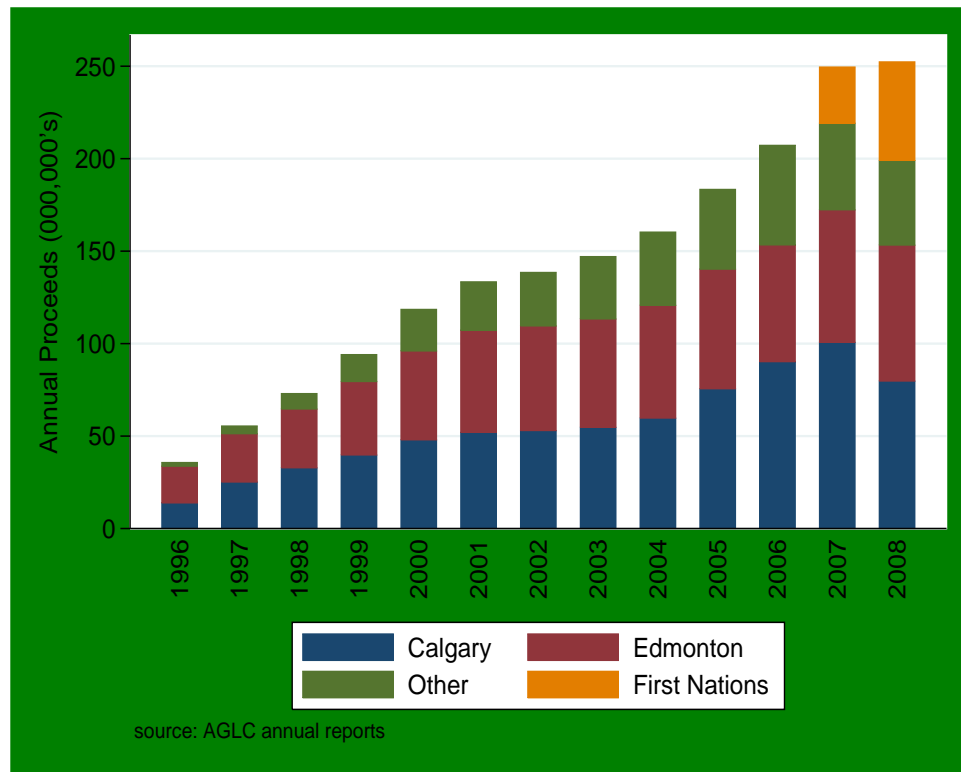
The tables and figures show a strong increase in the charitable proceeds from casinos throughout the province. The recent opening of First Nations casinos contributes to the increase, as it also appears that First Nations casinos are becoming an integral part of gambling activity throughout the province. The increase in the charitable proceeds from other locations in the province reflects the opening of casinos outside Calgary and Edmonton. In addition to the opening of casinos in areas outside the two major cities in the province, casinos in other areas of the province have used marketing strategies to draw visitors and tourists to these other locations from the two main cities in the province. More information regarding tourism and casinos can be found in Chapter 6.

### 11.1.3 Profile of Casino Gambling Participants

Table 11.4 contains a demographic profile of casino gamblers in Alberta. This demographic profile is based on data from the 2008 and 2009 population surveys carried out as part of this research project.<sup>2</sup> Appendix B describes these surveys in detail. In the case of casino gamblers, we based this profile on individuals who reported gambling on table games (craps, blackjack, and poker are examples) in Alberta in the past year in each survey.

<sup>2</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.

Figure 11.1: Charitable Proceeds from Casinos by Area



From Table 11.4, participation in casino gambling was relatively low. Only 8.7% of the sample reported participating in casino gambling. This translates to about 220,000 Albertans. Casino gamblers are likely to be young, employed males. The average age of casino gamblers is 35.5, considerably lower than the average age of all Albertans. In fact, out of all the games that we report in Table 18.1, it has the youngest average age. Over three-quarters of casino gamblers are employed full time compared to just over half for the general population. Almost 80% of casino gamblers are male, whereas the genders are split evenly among Albertans. The marital status of casino gamblers reflects their relative youth; they are in relationships, but are more likely to be living common law than legally married. Only 30% of them are single (34% in the general population), and 14.4% are living common-law (9%). Their relationships are more stable. They are only half as likely to be separated (1.5% vs. 3%) and also less likely to be divorced (5.2% vs. 8%).

The education level of Alberta gamblers can be considered less than the general population, and that is reflected in their income levels. At 5.2%, only a third as many have less than high school education than Albertans in general, at 15.4%. On the other end of the scale, more casino gamblers have university degrees (29.3% compared to 22%). More casino gamblers have only high school education, so when we sum all those with high school education or less, casino gamblers stand

at 40.7% whereas the general population totals 39.5%. Casino gamblers hold fewer trade degrees (10.8% vs. 12.4%) and college degrees (18.6% vs. 21.5%). The strong showing in university completion is insufficient to raise the income levels of casino gamblers above the average income levels for Albertans. Slightly more make less than \$40,000, but the difference there is slight. Where income levels differences are more noticeable is above \$40,000. Only 33.1% of casino gamblers make between \$40,000 and \$80,000, and 22.3% between \$80,000 and \$120,000. The population figures are 38.1% and 36.7% respectively. It is possible that age is a factor here. Being younger on average, casino gamblers may not have had the opportunity to develop their work experience or careers.

Casino gamblers are likely to be on average, younger, slightly less educated and make slightly less money than the average Albertan. They are predominantly male, and although they seem to form attachments quite readily, they are less inclined to legal marriage, and their relationships exhibit more stability than the general population.

Table 11.4: Demographic Profile of Casino Gamblers

<b>Demographics</b>		<b>Income</b>	
Participants in 2008	236,395	less than \$40,000	33.8%
Participants in 2009	214,869	\$40,000-\$80,000	33.1%
Average Age	35.5	\$80,000-\$120,000	22.3%
Male	79.7%	more than \$120,000	10.8%
Employed Full Time	77.1%		
Student	15.1%	<b>Total Amount of Debt</b>	
		No debt	17.6%
<b>Marital Status</b>		less than \$10,000	22.2%
Single	30.0%	\$10,000-\$100,000	28.6%
Common-law	14.4%	More than \$100,000	31.6%
Legally Married	47.5%	% Debt from Gambling	18.8
Separated	1.5%		
Divorced	5.2%	<b>Racial/Ethnic Origin</b>	
Widowed	0.6%	Western European	63.9%
		Eastern European	15.7%
<b>Education</b>		South Asian	1.5%
Less than High School	5.2%	East Asian	1.8%
Completed High School	35.5%	Aboriginal	8.8%
Trade Degree	10.8%	African	0.0%
College Degree	18.6%	Latin American	0.4%
University Degree	29.3%	Other	7.9%

## 11.2 Slot Machines

### 11.2.1 Description of Slot Machine Gambling in Alberta

Slot machines and VLTs are electronic gambling machines (EGMs) that offer a variety of games. They have a low overhead other than setup and periodic maintenance and, unlike table games, do not require attendants to operate them. This low operating cost permits establishments with EGMs to offer small individual bets, making EGMs attractive to gamblers. The wide availability of EGMs in the province — they are available at casinos, racetracks, and in local bars and taverns — exposes a large number of potential gamblers to EGMs.

There are three main types of EGMs available in the province, and the distinction between them can be confusing. EGMs in bars are called video lottery terminals, (VLTs), whereas EGMs at racetracks are slot machines. Casinos may offer video slot machines or video poker machines, but in general EGMs located at casinos are referred to as slot machines (Turner & Hornby, 2004).

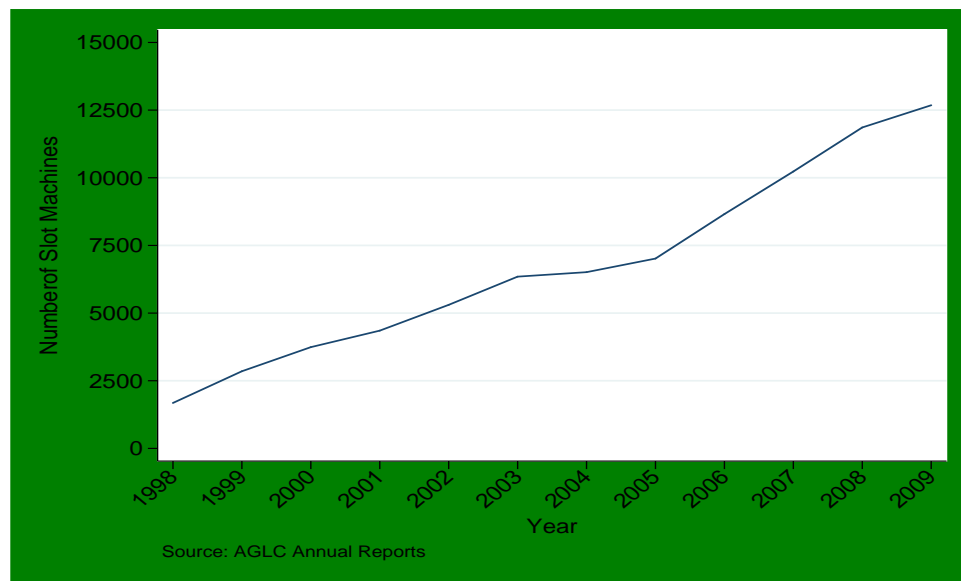
Some slot machines still have actual reels that display symbols and turn mechanically. When the symbols align in certain configurations, a win is triggered. Mechanical gambling machines have been rendered obsolete in Alberta, as have cash transfers. The mechanical reels have been replaced with a video display, hence the ‘video slot machine’ designation. The handling of cash has been rendered obsolete by the introduction of a voucher system where the player purchases credits from a separate kiosk at the establishment and inserts this voucher into the machine they wish to play. When they are finished playing and ‘cash out’, a new voucher is printed by the machine that displays the balance of their credits. In many cases all that remains from the ‘one-armed bandits’ of the previous generation of machines is a vestigial arm off to the side that allows the player the option of pulling a lever instead of pressing a button to begin a new round of play. The cost to play EGMs varies considerably with the machines, from pennies to nickels to as high as two or more dollars per cycle. The video display is based on an internal computer program and complex algorithm which allows the proprietor to change the game type or the odds with ease (Turner & Hornby, 2004).

EGMs that feature video poker do not permit as much flexibility in setting odds and pay outs as video slots. In the case of electronic poker machines, the distribution is that of a standard 52-card deck of playing cards, and the player is able to determine the odds of events based on cards displayed. Based on a player’s familiarity with cards and poker, choices can be made on which cards to hold, and for that reason the game is considered to involve an element of skill rather than pure chance (Turner & Hornby, 2004).

### 11.2.2 Availability of Slot Machines

The AGLC annual reports contain information on the number of slot machines in the province from 1998 through the present. Figure 11.2 summarizes these data.<sup>3</sup>

Figure 11.2: Number of Slot Machines By Year



On Figure 11.2, note the rapid increase in the number of slot machines in the province over time. Part of this increase has to do with growth in the number of casinos in the province over this period. Recall from Chapter 11 that the number of casinos increased during this time period from 19 to 24 with a drop in the middle years to 16. The other part has to do with the popularity of slots as a form of gambling entertainment.

### 11.2.3 Distributions of Charitable Slot Machine Revenues

All net revenues from slot machines in Alberta are transferred to the Alberta Lottery Fund for distribution. See section 10.2 on page 178 in Chapter 10 for a discussion of the Alberta Lottery Fund. Also, Table C.1 on page 314 contains detailed information about Alberta Lottery Fund disbursements.

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<sup>3</sup>In earlier AGLC annual reports, we interpret slot machines as casino gaming terminals.

### 11.2.4 Profile of Slot Machine Players

The survey of the Alberta population that the research group conducted in 2008 and again in 2009 examines the characteristics of slot machine players.<sup>4</sup> Table 11.5 displays the demographic profile of slot machine players in the province in 2008 and 2009.

Table 11.5: Demographic Profile of Slot Machine Players

<b>Demographics</b>		<b>Income</b>	
Participants in 2008	432,777	less than \$40,000	45.1%
Participants in 2009	401,972	\$40,000-\$80,000	29.6%
Average Age	44.3	\$80,000-\$120,000	14.8%
Male	50.0%	more than \$120,000	10.4%
Employed Full Time	57.9%		
Student	10.1%	<b>Total Amount of Debt</b>	
		No debt	19.5%
<b>Marital Status</b>		less than \$10,000	26.4%
Single	20.1%	\$10,000-\$100,000	29.9%
Common-law	13.3%	More than \$100,000	24.2%
Legally Married	51.3%	% Debt from Gambling	18.7
Separated	3.2%		
Divorced	4.6%	<b>Racial/Ethnic Origin</b>	
Widowed	6.5%	Western European	64.4%
		Eastern European	15.8%
<b>Education</b>		South Asian	1.6%
Less than High School	10.3%	East Asian	3.0%
Completed High School	39.4%	Aboriginal	6.2%
Trade Degree	11.2%	African	0.1%
College Degree	16.8%	Latin American	1.3%
University Degree	21.4%	Other	7.7%

The participation rate of slot machine players is 16.1%. This suggests that one in six Albertans have at some point during the year sought amusement, distraction or recreation at a slot machine in a racing entertainment centre or casino. Slots are the third most popular game amongst all the games in our population survey (Table 18.1). In the 2002 Alberta Gambling Survey, Smith and Wynne (2002) report that slot machines at the casino and racetracks are the fourth most popular gambling activity in the province.

Slot machine players are older, on average, than the average Albertan. They have balanced and equal representation from both genders, at 50%. Like their casino counterparts, considerably fewer slot players are single. Only 20.1% are single compared to 34% in the general population. While

<sup>4</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.

they commit to legal marriage with the same frequency (just over 50%), they form common-law relationships more often than the general population (14.4% compared to 9%). The separation rate of their unions is the same overall, but the divorce rate is lower. Among slot machine players, only 4.6% of relationships end in divorce compared to 8% for all Albertans. The higher rate of widowed players (6.5% vs. 5%) hints that slot machine players may draw from Alberta's population of seniors. Almost 40% of slot machine players have only a high school education, a respectable increase over the general population, at about 24%, and only 10.3% compared to 15.4% have less than high school education. Slot machine players seem to show less enthusiasm for post-secondary education than Albertans in general, however, particularly when it comes to college degrees. Their post-secondary achievements are limited to 11.2% in trades, 16.8% for other assorted college diplomas, and 21.4% have university degrees. By comparison, Alberta residents boast 12.4%, 21.5%, and 22% in the respective categories. Overall, only 49.4% of slot machine players pursued post-secondary education or training compared to nearly 56% of Albertans in general.

A greater percentage of slot machine players have full-time jobs (57.9% vs. 52%), but their earnings seem to be lower, perhaps reflecting their more modest academic accomplishments. Far more make less than \$40,000 per year, noticeably less make between \$40,000 and \$80,000, and the same applies to those making over \$80,000. For comparison, the percentages for each category are 45.1% to 33.5%, 29.6% to 38.1%, and 25.2% to 36.7%, respectively. The percentage of debt from gambling is identical to casino players.

The typical slot machine player in Alberta is equally likely to be male as female, but will be older, less educated, and have less income than the average Albertan. Fewer are single than in the general population, and their relationships are less likely to end in divorce.

### 11.3 Problem Gambling Incidence Rates

Problem gambling is an important component of any SEIG analysis. We anticipate that research by the University of Lethbridge research team will address problem gambling among casino and slot machine gamblers in Alberta in considerable detail. However, we have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult the University of Lethbridge report when it is made available.

## Chapter 12

# Video Lottery Terminals (VLTs)

### 12.1 VLT Gambling in Alberta

VLTs are electronic gaming machines that are programmed as part of a centralized system, not by the administrators at their locations. It is this distinction that puts the ‘lottery’ in video lottery terminal. Like slot machines, though, they are capable of playing a variety of games, including slot and poker games. For the most part, slot machines at casinos are single game machines, but in order to reach a broader market with few machines, VLTs are more versatile and allow the player to select their preferred format (Turner & Hornby, 2004).

Regardless of the type of game played, the results are neither random nor uncertain. Nor do the number, or distribution, of symbols on the simulated reels of video slots play any part in the outcome. This is due to the fact that the outcomes are predetermined by an algorithm which in turn is based on a computer-generated *random* numbers. The italics are to emphasize that, ironically, computers are not capable of generating truly random numbers. The distinction is lost to the player, however, who only sees the ‘reels’ coming to rest in their pre-assigned positions (Turner & Hornby, 2004).

In both the 1998 and 2002 studies examining gambling within Alberta, VLTs were associated with problem gambling and consumers identified as problem gamblers were more likely to list VLTs as their favorite gambling activity (Smith & Wynne, 2004). After the 1985 amendment to the Criminal Code, Alberta introduced VLTs on a preliminary basis in 1991. In March 1992, the Alberta VLT program began on a non-trial basis. Smith and Wynne (2004) detail the subsequent meetings and political dialogue surrounding VLTs in Alberta. According to Smith and Wynne (2004), half of Alberta’s gambling profits came from VLTs.



### 12.1.1 Sources and Limitations of VLT Data

The Alberta Gaming and Liquor Commission (AGLC) provided the research team data on VLTs in Alberta. The data that was provided gave specific community level information from 1994 through 2008. The information provided included the number of VLTs located in the community and the number of locations that have VLTs. In addition, the data included the revenues generated from these VLTs.

The data provided by AGLC did come with limitations. The main limitation was missing incomplete information on the number of VLTs and the revenues and expenses for these VLTs. In speaking with AGLC staff, many of the missing observations come from the implementation of a new computer system earlier this decade. Table 12.1 provides the number of missing values for each variable of the AGLC data. For the years of 1994-2008, there were a total of 3,848 city-year observations. In examining Table 12.1, one can see that many missing values exist in the data provided and that could have an effect on the data that is presented below. When individually examining the missing data points, one notices that the values are concentrated in certain years and not distributed evenly throughout all sample years. This is shown on Table 12.2. For example, in 2003 all of the expense and revenue data is missing from the data.

Table 12.1: Missing VLT Observations

Variable	Missing Values	Total Observations	% Missing
Number of VLT	88	3,848	2.29
Number of VLT Locations	86	3,848	2.23
Revenues	260	3,848	6.76
Expenses	260	3,848	6.76
Net Sales	2	3,848	0.05

## 12.2 Availability of VLTs

Figure 12.1 shows the total number of VLTs in the province in each year since their introduction. AGLC has authorized a maximum of 6,000 VLTs in the province since they were introduced in 1994. From the data we received from AGLC, the number of VLTs is not given for some locations. From Figure 12.1, only about 4,500 VLTs were in place in 1994, but after this introductory period, the number of VLTs in the province has remained within the 5,950-6,000 range. Therefore, the net sales variability shown above cannot be due to the variability in the number of VLTs.

The second measure of supply of VLTs is the number of locations, or communities, with VLTs in the province. This information is contained in the AGLC annual report. Figure 12.2 shows the number of VLT locations per year from 1994 through the present.

Table 12.2: Missing Value Counts by Year, VLT Data

Year/Variable	Number of VLTs	Number of VLT Locations	Revenues	Expenses	Net Sales
1994	6	6	0	0	0
1995	15	15	0	0	0
1996	11	11	0	0	0
1997	8	8	0	0	0
1998	11	11	0	0	0
1999	10	10	0	0	0
2000	8	8	0	0	0
2001	9	9	0	0	0
2002	3	1	0	0	0
2003	6	6	260	260	0
2004	17	17	2	2	2
2005	2	2	0	0	0
2006	2	2	0	0	0
2007	4	4	0	0	0
2008	4	4	0	0	0

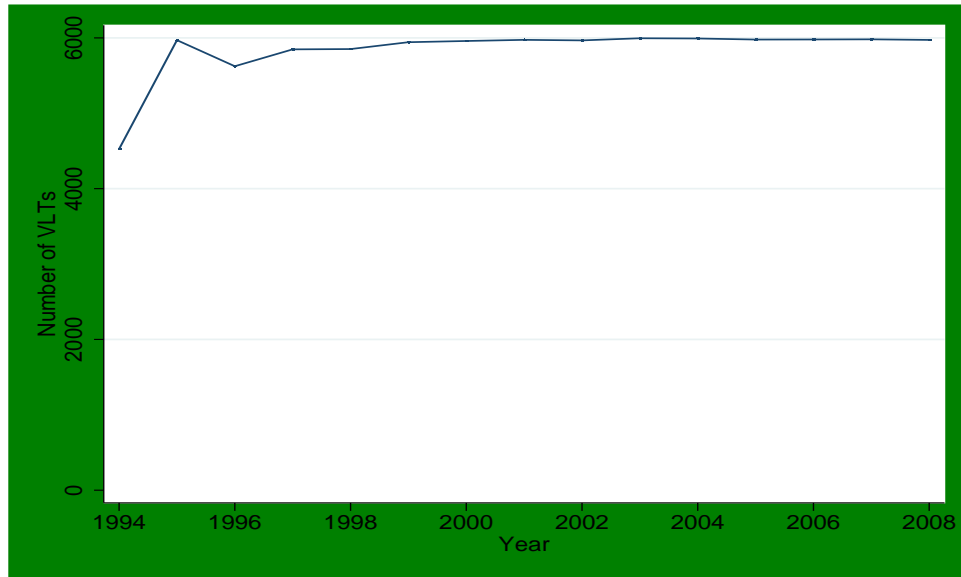
Notice the decline in the number of locations that have VLTs on Figure 12.2. This decline can be due to several factors. First, the province caps the total number of VLTs at 6,000, but many locations have requested, and gotten, additional machines due to strong demand, leading to a concentration of VLTs into fewer communities. Second, some communities voted to eliminate VLTs from their jurisdictions due to concerns about gambling addiction. The overall effect has been to concentrate the 6,000 VLTs in the province in a smaller number of locations.

The third measure of supply is to see how many cities have at least one VLT during the time period. This is different from Figure 12.2 because Figure 12.2 deals with establishments and not communities. Figure 12.3 shows how many cities per year in the province have at least one VLT. From the figure, one notices that the number remain relatively consistent throughout the sample period. Even though the number is consistent, the number of cities over the past four years in the sample has decreased from the earlier years in the sample.

The final breakdown in the supply of VLTs shows the number of VLTs in each census division across the sample period. Recall that there are 19 census divisions in the province. Due to the number of years of data available and the number of census divisions, we present the information in two tables. Table 12.3 contains the number of VLTs by census division for the years 1994 through 1999 and Table 12.4 contains the number of VLTs by census division for the years 2000 through 2008.

From Tables 12.3 and 12.4, a decline in most census divisions in the number of VLTs from 1994 to 2008 can be seen, even though the overall total number of VLTs increased over that period.

Figure 12.1: Number of VLTs by Year



Census division 16 contains Fort McMurray, which passed the law eliminating VLTs in the city in 2002. These VLTs were redistributed to other census divisions in the province. Overall the total number of VLTs in census divisions has remained relatively constant over the past few years.

## 12.3 Playing VLTs

In order to maximize participation in VLT play, one of the prominent design considerations in game design is simplicity. The machines themselves are owned by AGLC. Proprietors of lounges and bars can apply for a license, and if they meet the conditions (details available at <http://www.aglc.gov.ab.ca/gaming/videolotteryretailers.asp>) AGLC provides the machines and pays the proprietor a weekly 15% commission on VLT net sales (cash in less cash out).

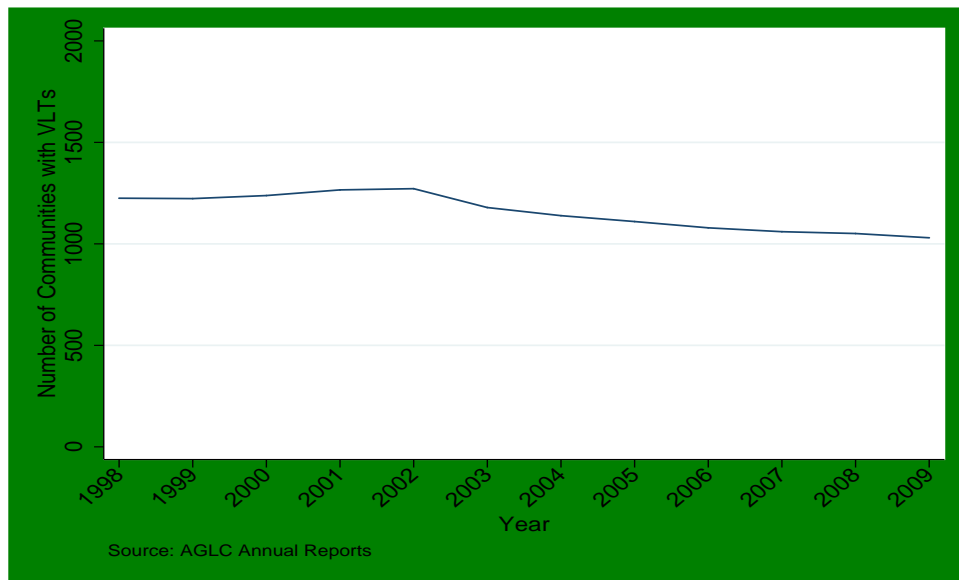
The play itself is described in a section of Liquor Licensee Handbook produced by AGLC, available on the web at the link above. From the Liquor Licensee Handbook:

**10.17.1** A variety of games are offered on VLTs. Game instructions and pay-out tables are available at each terminal.

**10.17.2** The pay-out is approximately 92%.

**10.17.3** The minimum bet is one credit (25 cents) and the maximum bet is 10 credits (\$2.50).

Figure 12.2: Number of VLT Locations by Year



**10.17.4** The maximum that can be won in a single game or spin is 4,000 credits or \$1,000.

**10.17.5** When 5,000 credits are attained, the VLT automatically produces a cash-out ticket of \$1,250.

**10.17.6** Players receive one (1) cash-out ticket and any outstanding credits remain on the terminal until either played or cashed-out.

**10.17.7** All game chips are tested by an approved independent gaming laboratory prior to installation in the VLTs to verify the pay-out percentage conforms to the approved range.

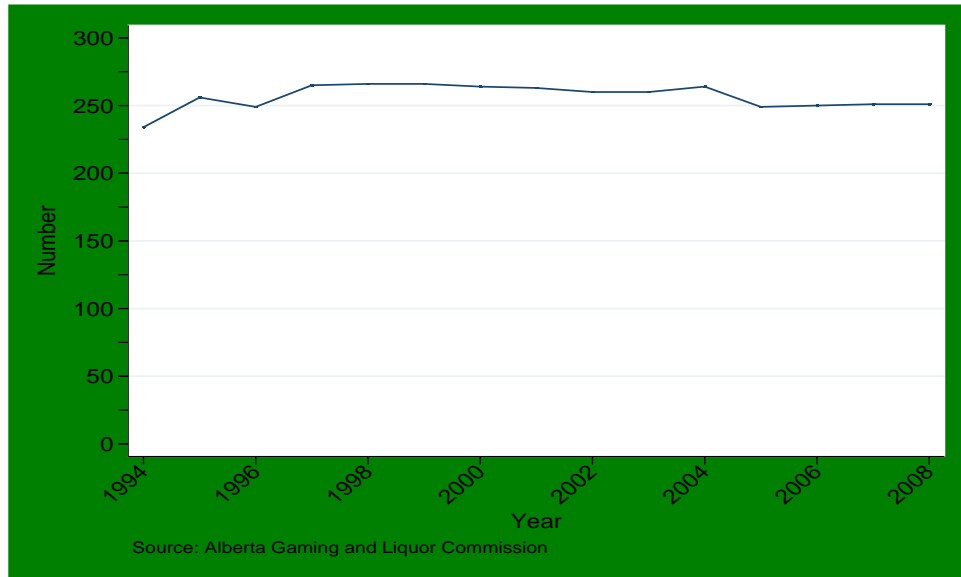
**10.17.8** A VLT malfunction voids all plays and all pay-outs.

**10.17.9** Player disputes should be directed to Gaming Irregularities. The AGLC investigates all complaints.

(Alberta Gaming and Liquor Commission, 2009b, p 10.17)

Item 10.17.1 describes one of the salient features that separates VLTs from slot machines. Where slot machines are dedicated to one game format, such as video poker or one of the many variations of simulated spinning reels, VLTs are set up with a menu from which the player can select his or her preferred game format. Casinos can exploit this difference by combining banks of similar games with appropriate inducements (lights, colour, and sound) to attract players. VLTs by necessity must remain more generic, but still employ the usual light and sound patterns to attract players. Naturally, in a lounge or a bar, VLTs must remain largely unobtrusive while still

Figure 12.3: Number of VLT Communities by Year



advertising their presence, and in particular they are designed to broadcast winning poker hands or combinations of reels. This makes the delivery of the game to consumers fundamentally different from slot machines.

Having selected a game, the prospective player can insert a bill in Canadian currency not exceeding \$20.00. This buys credits at \$0.25 each, and as indicated in 10.17.3, the player can commit up to 10 credits on a hand of poker or a spin of the reels. The machines have been reconfigured so that they no longer pay out in cash, but rather issue a voucher, or cash-out ticket that can be presented and redeemed on demand for its cash value at the host establishment.

The payout is approximately 92%, but that is the probability for a single play. The typical pattern is that the payout is recirculated through repeated plays until it is considerably less than 92%. For instance, if a player recirculates winnings through 5 cycles, the expected payout drops from 92% to 66% so the player ends up losing a third of the original bet. According to the education level of VLT players described in the demographic profile, the calculations involved in this, raising 0.92 to the power of five may well be beyond the mathematical capacity of many VLT players. The result may be that they misinterpret the 92% figure and fail to recognize the inevitability of greater losses as they continue playing.

## 12.4 Economic Activity Associated with VLTs

AGLC provided the cash in and cash out data for the VLTs in specific communities in the province except for 2003. Cash in and cash out data are not available for 2003. Figure 12.4 presents the cash

Table 12.3: Number of VLTs by Census Division: 1994-1999

CD/Year	1994	1995	1996	1997	1998	1999
1	204	244	230	233	244	239
2	275	349	327	342	338	346
3	71	84	84	75	74	76
4	51	65	65	65	68	64
5	115	154	153	171	151	163
6	955	1,368	1,292	1,384	1,420	1,443
7	123	154	151	175	172	167
8	298	387	357	366	358	358
9	40	52	52	49	15	15
10	193	232	237	242	243	251
11	1,358	1,824	1,658	1,713	1,731	1,757
12	94	144	149	148	143	158
13	150	171	172	172	172	176
14	66	91	91	79	83	90
15	124	159	148	157	154	138
16	93	124	108	105	102	99
17	84	108	102	118	121	132
18	36	40	34	38	44	41
19	195	220	214	216	219	230
Total	4,525	5,970	5,624	5,848	5,852	5,943

in (revenue) figures for the province during the sample years. The monetary values in these figures are in millions of 2008 dollars. As one can see from Figure 12.4, the province saw an increase in the amount of money spent on VLTs since 2004.

Figure 12.5 presents the cash out figures for the VLTs in the province. The cash out sales is the amount that is paid back out to the consumers in the form of winnings. Similar to Figure 12.4, the amounts provided are in millions of 2008 dollars. Figure 12.5 also provides a similar picture that Figure 12.4 does which makes sense because there has not been any change to the winning percentage of these machines.

The following figure and tables presents the net sales from the provincial and census division levels. Figure 12.6 represents the net sales by year from all VLTs in the province in Alberta. The net sales figures are presented in 2008 real dollars and are expressed in millions. Net Sales is found by subtracting the cash out from the cash in. Unlike the cash in and cash out values, AGLC does have the net sales for 2003. From Figure 12.6, notice the high variable figures throughout the sample time period. Taking a closer examination, one notices a sharp increase at the turn of the century in net sales followed by a sharp decline in 2003 and 2004. After 2004, one notices a sharp increase in net sales until 2007. In 2008, the amount of net sales declines. The increase is not due

Table 12.4: Number of VLTs by Census Division: 2000-2008

CD/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
1	237	241	245	232	234	232	234	246	223
2	333	336	339	347	357	342	334	336	324
3	76	76	76	72	69	69	68	71	64
4	67	66	63	62	55	48	49	46	46
5	162	153	150	147	155	152	147	151	157
6	1,451	1,480	1,471	1,496	1,587	1,602	1,623	1,666	1,666
7	169	174	178	177	177	171	149	145	139
8	364	362	365	353	317	314	326	319	317
9	15	15	15	15	15	17	17	19	21
10	254	251	250	253	243	249	264	269	272
11	1,748	1,750	1,745	1,730	1,791	1,787	1,780	1,707	1,694
12	152	142	140	154	166	160	157	159	187
13	182	185	185	189	179	181	180	190	191
14	93	102	96	97	106	105	113	104	110
15	136	132	134	135	106	99	91	94	91
16	99	99	99	99	0	—	—	—	—
17	135	130	130	140	149	164	160	163	164
18	41	41	41	46	46	46	51	58	58
19	245	239	245	251	240	240	236	238	249
Total	5,959	5,974	5,967	5,995	5,992	5,978	5,979	5,981	5,973

to an increase in the number of VLTs as Figure 12.1 has shown a slight decrease in the number of VLTs during that time.

## 12.5 Distribution of Charitable VLT Revenues

All net revenues from VLTs in Alberta are transferred to the Alberta Lottery Fund for distribution. See section 10.2 on page 178 in Chapter 10 for a discussion of the Alberta Lottery Fund. Also, Table C.1 on page 314 contains detailed information about Alberta Lottery Fund disbursements.

## 12.6 Profile of VLT Gambling Participants

In their report, Smith and Wynne (2004) outline a demographic profile of VLT players in the province using two surveys, the 2002 Gambling prevalence survey and their VLT study. In the report, a VLT player is male and usually between the ages of 30 and 50. The majority of players is married and has completed high school.<sup>1</sup> In terms of annual household income, the majority of respondents in the VLT study had less than 39,000 in annual income while the 2001 survey, the two highest reported groups are between 30,000-39,999 and 40,000-49,000. Finally, the majority of participants in both studies were employed full-time.

<sup>1</sup>It should be noted that in the 2001 survey, the majority of respondents completed college, technical school, or university.

Figure 12.4: VLT Revenues Per Year

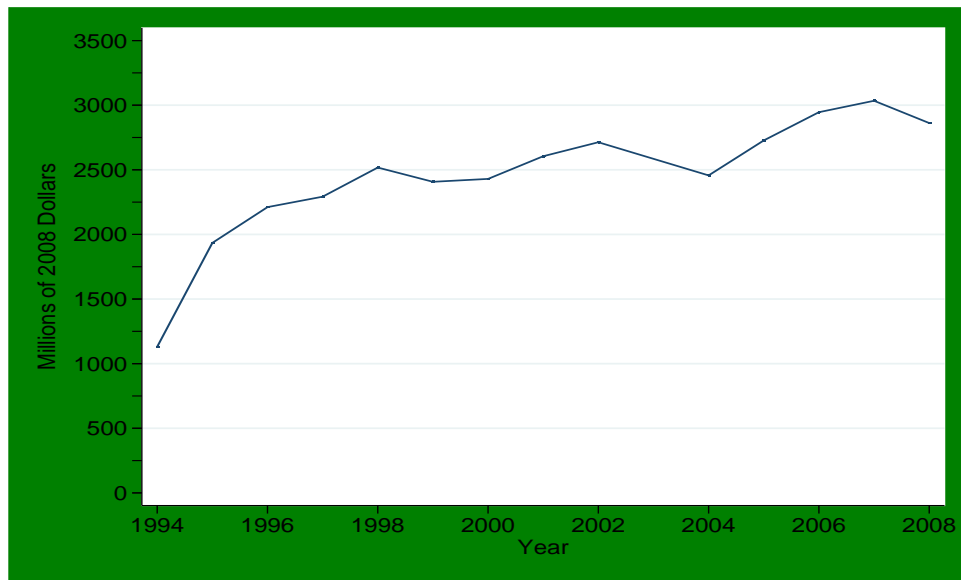


Table 12.5 presents the demographic profile of video lottery terminal (VLT) players in Alberta, based on data from the 2008 and 2009 population surveys carried out as part of this research project.<sup>2</sup> This profile is based on survey data that has been weighted to adjust the sample to match the age-sex population of Alberta based on the 2006 Census.

The VLT participation rate in Alberta is 12.4%. This translates to about 316,000 Albertans in 2009. Of these, 57.3% are males, compared to 50% of Albertans. The average age of VLT players is 44.4, which is slightly higher than the age of the average Albertan. Fewer VLT players than in the general population are single (28.7% vs. 34%), and fewer are legally married (42.5% vs. 51%). More than average find themselves in common-law relationships, and fewer are divorced (17% to 9%, and 4.4% to 8%).

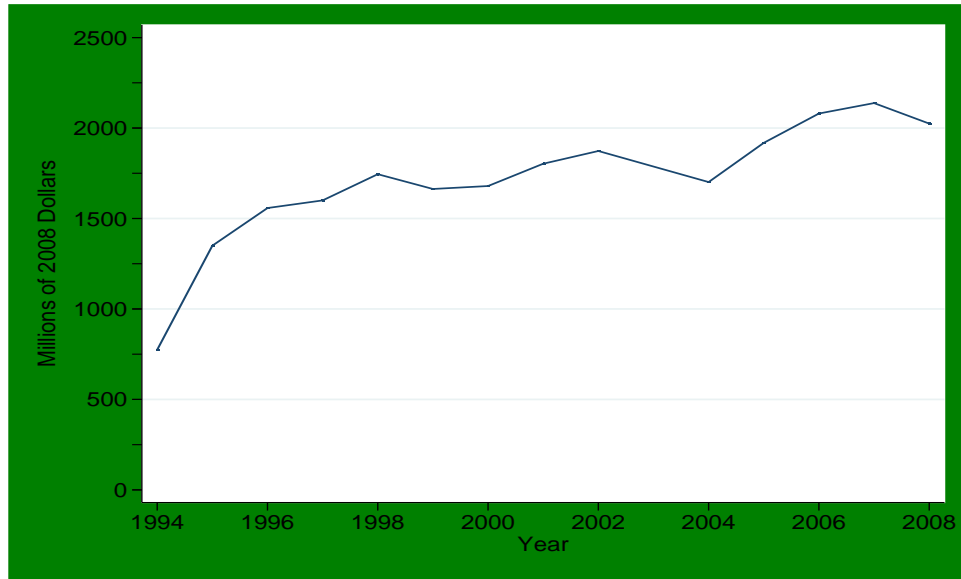
Overall, VLT players are less educated than the average resident of Alberta. Almost 54% have high school education or less, compared to almost 40% in the general population. As a result we would expect to see fewer VLT players with post secondary education, and the statistical comparisons bear this out. Although the same proportion attain college level trades certification, fewer college (15.2% to 21.5%) and university graduates (18.2% to 22%) play VLTs.

As a result of having less education, VLT players have lower incomes than average, even though a greater proportion of them, at 59.2%, are employed full time (52% is the provincial average) more than half (51.2%) make less than \$40,000 a year, while only a third (33.5%) of Albertans earn in

<sup>2</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.



Figure 12.5: VLT Expenses Per Year



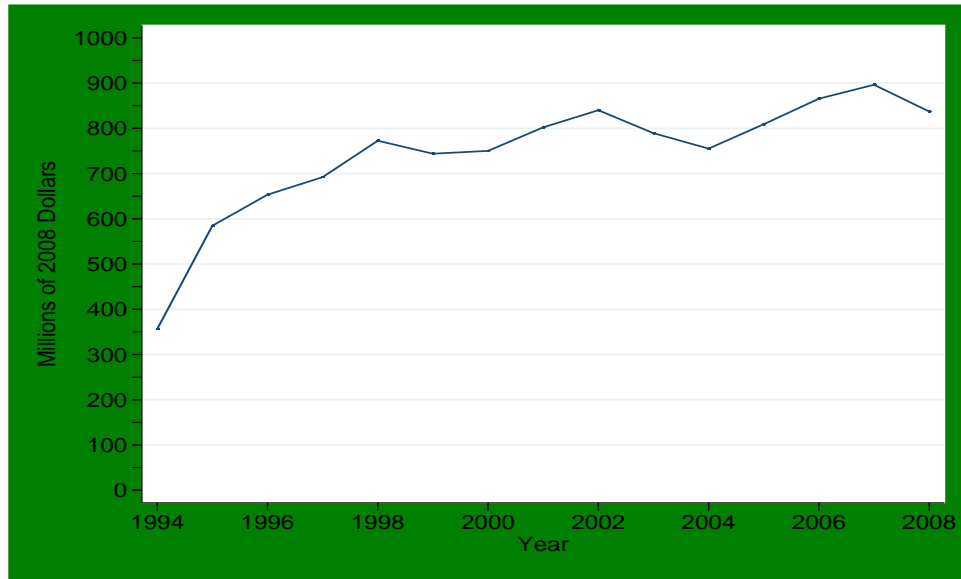
that range. Likewise, 25.5% make between \$40,000 and \$80,000, far fewer than the 38% in the general population. The remaining proportion of wage earners above \$80,000 is also smaller.

The average VLT player in Alberta is less educated and less wealthy than average. They are just a bit older on average, about 2 years. Males outnumber females by a small amount, and for the most part they are married or living common law in relationships that seem more stable than average. In general, these results concur with Smith and Wynne (2004).

Since slot machines and VLTs are similar in some areas as noted previously, it is important to analyze the similarities and differences of the demographic profiles.<sup>3</sup> Overall, slots are generally more popular than VLTs as there is a four percent difference between the two games. The average age of the players in both games is the same which makes sense considering the similarities amongst the two games. Slot machine players are generally married which is the same as VLT players. However, the percentage of married VLT players are lower. As a result, there is a higher percentage of single people playing VLTs. The education profile is almost identical with both games. The difference comes in the debt category with VLT players in two of the three debt range groups having a greater percentages. In addition, VLT players have a higher percentage of debt from gambling (21 percent) than slot players (18 percent). This could be due to problem gamblers being more likely to use VLTs. This is one of the points that people favoring the elimination of VLTs state.

<sup>3</sup>Table 11.5 presents the demographic profile of slot machine players.

Figure 12.6: VLT Net Sales Per Year



## 12.7 Problem Gambling Incidence Rates

Problem gambling is an important component of any SEIG analysis. We anticipate that research by the University of Lethbridge research team will address problem gambling among VLT gamblers in Alberta in considerable detail. However, we have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult the University of Lethbridge report when it is made available.

Table 12.5: Demographic Profile of VLT Machine Players

<b>Demographics</b>		<b>Income</b>	
Participants in 2008	326,993	less than \$40,000	51.2%
Participants in 2009	315,870	\$40,000-\$80,000	25.5%
Average Age	44.4	\$80,000-\$120,000	12.2%
Male	57.3%	more than \$120,000	11.1%
Employed Full Time	59.2%		
Student	11.2%	<b>Total Amount of Debt</b>	
		No debt	21.3%
<b>Marital Status</b>		less than \$10,000	24.6%
Single	28.7%	\$10,000-\$100,000	30.9%
Common-law	17.0%	More than \$100,000	23.3%
Legally Married	42.5%	% Debt from Gambling	21.1
Separated	3.2%		
Divorced	4.4%	<b>Racial/Ethnic Origin</b>	
Widowed	4.0%	Western European	64.5%
		Eastern European	13.7%
<b>Education</b>		South Asian	0.6%
Less than High School	14.5%	East Asian	3.9%
Completed High School	39.2%	Aboriginal	8.1%
Trade Degree	12.3%	African	0.0%
College Degree	15.2%	Latin American	2.1%
University Degree	18.2%	Other	7.2%

## Chapter 13

# Lotteries

### 13.1 Lottery Gambling in Alberta

Lottery, sometimes called “Lotto” although this term technically applies to large jackpot lottery games, is a game where consumers select a set of numbers from a given range. A person wins the grand prize when he/she correctly picks all numbers. Lotto is one of the most common forms of gambling world-wide and one of the most common gambling forms put on by provincial and national governments. Draws for lottery usually occur a couple of times per week. Within Alberta, there are many different forms of traditional lotto including Lotto 649, Western 649, Pick 3, and Lotto Max.

Lotteries in Canada operate at the provincial, multi-provincial, and national level. In order to generate large enough jackpots to attract ticket buyers, lottery games are designed to extend over as large a population as possible, including across provincial boundaries. This is called economies of scale in economics, and the presence of these economies of scale permit efficient operation of lotteries. This in turn necessitates multiple layers of responsibility for the operation of loteries. At the national level, lotteries in Canada are still conducted on behalf of Her Majesty the Queen. The agency charged with this responsibility is the Interprovincial Lottery Corporation (ILC). The ILC was formed in 1976 by Canada’s five lottery commissions, including Alberta’s at the time. The Government of Alberta and the other member provincial governments are shareholders in the ILC.

The Western Canada Lottery Corporation (WCLC) is one of five regional marketing organizations that make up the ILC. The WCLC was established in 1974 by the provincial governments of Alberta, Saskatchewan, and Manitoba as a non-profit organization.<sup>1</sup> The founding members were later joined by associate jurisdictions comprised of the Yukon Territories, the Northwest Territories,

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<sup>1</sup>Information on the WCLC is available on line at [http://www.wclc.com/about/about\\_wclc.html](http://www.wclc.com/about/about_wclc.html)

and Nunavut. Within the jurisdiction of the WCLC, any ticket purchased in one member province can be validated in another.

Agencies of the member provinces partner with the WCLC in order to protect the interests and ensure compliance with individual provincial regulations. Two representatives from each of the member provinces sit on the board of the WCLC. Ticket lotteries in Alberta are regulated by the Alberta Gaming and Liquor Commission (AGLC). The primary operator of lotteries, however, is the WCLC, with whom AGLC has formed a partnership. Together the AGLC and WCLC negotiate and authorize the retail agreements under which retailers provide space and services for lottery terminals. A retailer is an entity (person, corporation, partnership) authorized jointly by AGLC and WCLC to sell lottery tickets. They are also expected to assist in operating the lottery through customer service, providing information as well as validating and redeeming tickets. The retail agreement is the legal document binding the retailer, the AGLC and the WCLC to its terms and conditions. By extension, retailers must abide by rules and regulations of all three entities, ILC, AGLC, and WCLC.

The WCLC and AGLC market lottery schemes jointly. Not only can they participate in national lotteries such as the 6/49 and Lotto Max (by their association with the ILC), but they also can develop and market their own products, such as Western 49, Pay Day and Pick 3, which are available only in western provinces. The partnership involves processing applications for gaming agreements, and entering into agreements to sell, advertise or distribute gaming products through a province-wide network of retailer locations.

WCLC owns the lottery ticket terminals and AGLC is responsible for installation and maintenance, but WCLC operates the computers upon which the ticket numbers generated on-line are stored. AGLC is also responsible for all signs related to lottery ticket products and sales. Thus if a customer has a prize claim dispute, they are referred to WCLC for resolution. The WCLC is charged with the maintenance of the lottery ticket terminals, and retailers are directed to contact WCLC for any mechanical problems or other malfunctions pertaining to the machines. WCLC maintains a toll free hotline to assist in resolving technical issues related to lottery ticket terminals. They are also responsible for signs and fixtures relating to lottery products and sales.

There are currently almost 2,400 lottery retail locations in Alberta. At each location at least two employees must be trained and certified on all aspects of the operation of the lottery ticket terminal by an AGLC representative. Commissions are paid to the retailers as part of a simple incentive scheme that rewards agents for higher sales. The base level is 5% of net sales and 2% of prizes redeemed by the retailer. Additional tiers of compensation reward the retailer for higher sales. The structure as described in the following excerpt from AGLC's 2004 Annual Report is still current, and gives an idea of the proportionate scale of commissions.

Ticket lottery retailers earn commissions of five percent on their gross sales, a two percent redemption commission based on prizes paid out from their location as well as an additional compensation based on sales volumes. This totaled \$30.5 million in commissions on lottery ticket gross sales of approximately \$442.1 million in 2003-2004. In 2002-2003, the total in commissions were \$30.6 million on gross sales of \$442.6 million. The retailer commission rate represents reasonable compensation for the retailer's space, customer service and a return on investment. The remaining proceeds from ticket lottery sales are returned to the Alberta Lottery Fund after the AGLC/WCLC operating costs are deducted (Alberta Gaming and Liquor Commission, 2004, p. 42).

According to the 2009 AGLC Annual Report, lottery terminals have been modified recently due to concerns regarding the integrity of lottery prize claims in other provinces. The Western Canada Lottery Corporation (WCLC) conducted a review of the terminals and the process. Based upon the review, some new measures were implemented. These measures included the installation of new lottery terminals across the entire province, enhanced training for retailers, and criminal background checks of retailers. Finally, winners of prizes over \$1,000 must participate in an enhanced interview process. What effect these changes will have on lottery sales is unclear at this time.

## 13.2 Availability of Lottery

We received data about lottery ticket centres (LTCs) from AGLC. The LTC data are from 1994 through 2008. The data included information about the number of retailers, number of lottery terminals, and the net sales in specific Alberta communities. Net sales are defined as the difference between ticket sales and winnings from the community. As a result, we are able to provide a detailed review of the information similar to the previous chapter on VLTs (Chapter 12). Similar to the VLT data, some missing values were present within the lottery data. Below provides a summary of the number and percentage of missing values for the key variables (Table 13.1). In addition, we provide how those missing values are distributed over the years (Table 13.2).

Table 13.1: Missing Values in Lottery Data

Variable	Missing Obs	Total Obs	Pct Missing (%)
LTC retailers	85	3,978	2.14
LTC terminals	86	3,978	2.16
Net Sales	1	3,978	0.03

Approximately two percent of the observations were missing from the LTC retailers and terminals data obtained from AGLC. Only one observation was missing from the net sales variable and

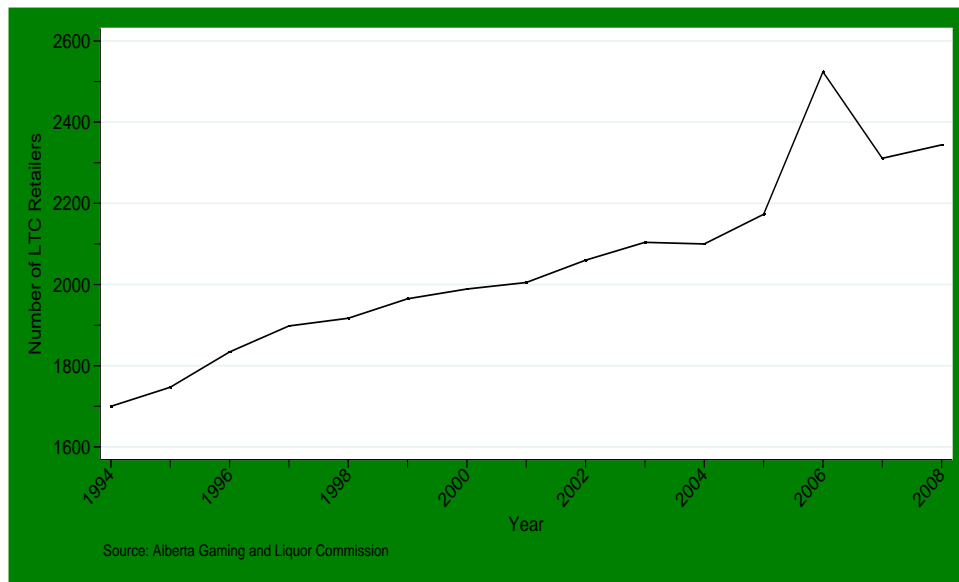
Table 13.2: Missing Value Counts by Year for Lottery Variables

Variable/Year	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'05	'06	'07	'08
Retailers	12	16	16	12	8	4	3	7	0	0	0	0	0	3	4
Terminals	12	16	16	12	8	4	3	7	0	0	0	0	1	3	4
Net Sales	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

that occurs in 2003. In examining Table 13.2, one notices that the majority of the missing values for retailers and terminals occur from 1994-1997. The last two years of the sample (2007 and 2008), missing counts increased compared to earlier in the decade.

We examine the supply of lottery products (defined as the number of lottery ticket retailers or terminals) in the province over the period 1994-2008.<sup>2</sup> Figure 13.1 summarizes the data on the number of lottery ticket retailers and Figure 13.2 summarizes information about the number of communities in Alberta that have at least one LTC.

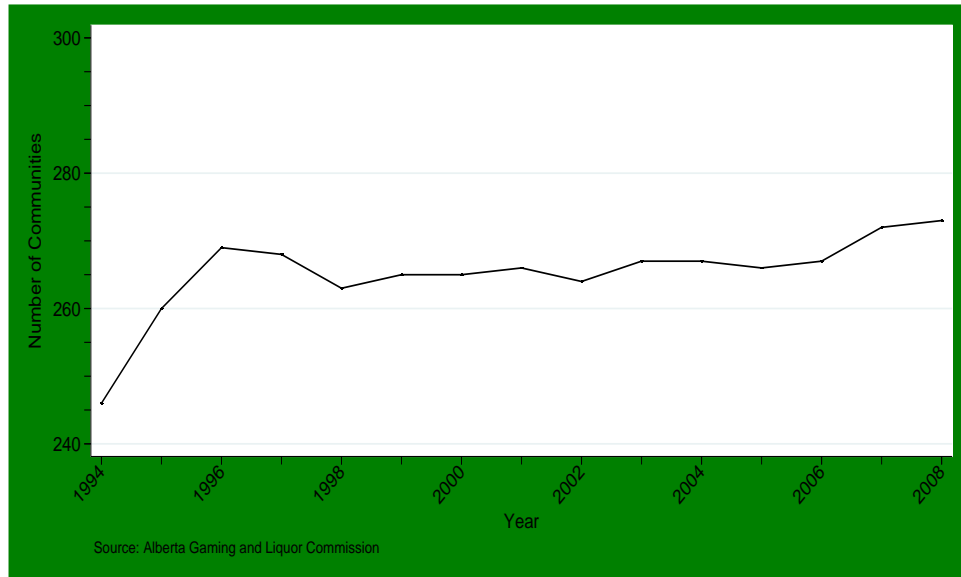
Figure 13.1: Number of Lottery Ticket Retailers (1994-2008)



In examining the two previous figures, one notices a general increase in the number of lottery ticket retailers in the province from 1994 through 2008. From Table 13.1, one does notice a spike in the number of retailers in 2006 which then decreases after that year. We do not know what caused that sudden increase and decrease. When examining Figure 13.2, one notices that since 1996, the number of communities remain steady for the most part with a slight increase. However, we do not see a sudden spike in the number of communities with LTCs in 2006 like we see with the number

<sup>2</sup>When examining the number of LTC Retailers and LTC Terminals, the numbers are almost identical.

Figure 13.2: Number of Communities with LTCs



of retailers in Figure 13.1. As a result, we can assume that more lottery ticket retailers were put in existing lottery markets. We examine lotteries more in depth in Chapter IV which examines the impact of gambling by geography.

### 13.3 Net Sales of Lottery Tickets

AGLC did not provide us with revenues from individual LTCs. However, we do have data on total net sales of lottery tickets in the province from AGLC annual reports. Figure 13.3 presents the net sale figure in millions of 2008 dollars.

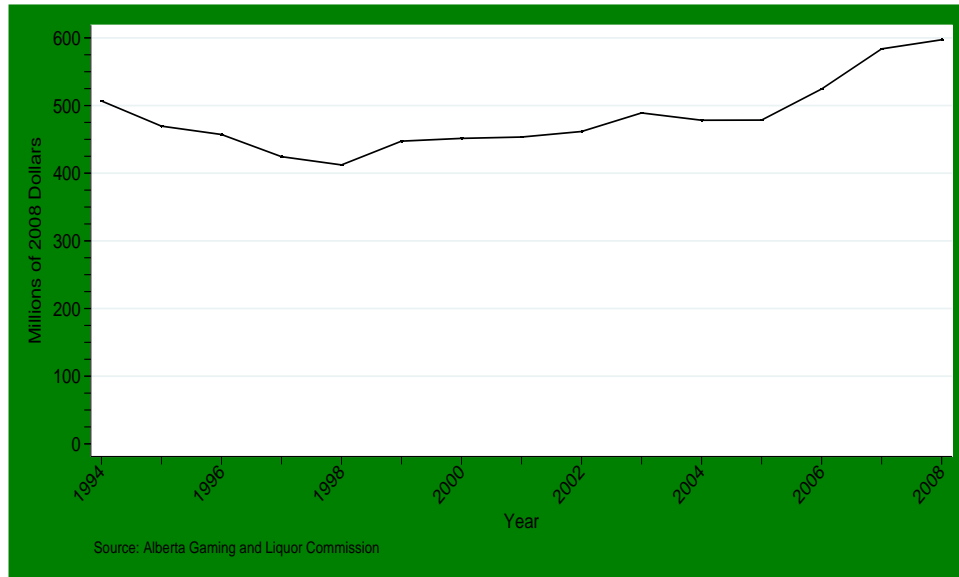
From Figure 13.3, note the increase in net sales over the period. Currently, net sales are approximately 600 million dollars pre year in the province and has been increasing continuously since 1998. More information regarding the geographic breakdown of lottery sales occurs in Chapter IV.

### 13.4 Distribution of Charitable Lottery Revenues

All net revenues from ticket lotteries in Alberta are transferred to the Alberta Lottery Fund for distribution. See section 10.2 on page 178 in Chapter 10 for a discussion of the Alberta Lottery Fund. Also, Table C.1 on page 314 discusses Alberta Lottery Fund disbursements.



Figure 13.3: Net Lottery Ticket Sales Per Year



## 13.5 Profile of Lottery Participants

According to Smith and Wynne (2002), the latest survey of gambling in Alberta prior to this report, 61.8 percent of Albertans bought at least one lottery ticket in the previous year. At that time, lottery was the most common gambling activity in Alberta. The 2008 and 2009 population surveys contained questions about participation in the traditional lotto (for example Lotto 649) and also secondary “lotto type” games (for example scratch off tickets).<sup>3</sup> Out of the games that we questioned survey participants regarding their gambling participation, traditional lotto was the most popular game by over 20 percent over the second most popular game. Instant win or scratch off tickets was the third most popular gambling type among Albertans with a total of 29.2 percent according to Smith and Wynne’s (2002) study and is the second most popular game in the province according to our results.

Table 13.3 contains the demographic profile of traditional lottery players in Alberta, based on data from the 2008 and 2009 population surveys carried out as part of this research project. This profile is based on survey data that has been weighted to adjust the sample to match the age-sex population of Alberta based on the 2006 Census.

The participation rate in traditional lotteries, these being tickets purchased with selected numbers on them which, if matched during the lottery draw win monetary prizes (often very large), is 59.3%. This is the highest of all the gambling sub-groups, and in 2009 represented over one and a

<sup>3</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.

half million residents of Alberta. In fact, this was an increase over 2008, perhaps due to a change in the menu of lotteries available that year. In September of 2009, Lotto Max replaced Lotto Super 7. The average age of lottery ticket buyers is above the population norm, at 45.5 years compared to 42.3. The gender distribution of lotto players is evenly split, with just a slight edge (at 52%) of male participation. The population of Alberta is evenly distributed between genders at 50% each.

With such a high participation rate, the demographic profile of lotto players might be expected to resemble the profile of Albertans in general. While this holds true for gender distribution, the profiles diverge on marital status, education and income. Fewer lotto players are single, at 17.6% compared to 34% of Alberta residents. The higher incidence of pairing is manifest in higher rates for both legally married (57.4% vs. 51%) and common law status (10.7% vs. 9%). While the proportion of separated and widowed matches the general population, lotto players seem less inclined to divorce, reporting a rate of 5.9% compared to 8% overall.

The education level of lotto players appears to be somewhat higher than the general population. More lotto players have completed high school, at 34.8% (compared with 24.1% of Alberta residents), and fewer, at 9.1% have attained less than that level (15.4%). Interestingly, fewer lotto players have attended college, either for trades certification or other training (10.6% to 12.4%, and 18.2% to 21.5%). On the other hand, they seem to prefer university education. The percentage of lotto players with university degrees, at 26.6% exceeds the Alberta norm by almost 5%.

In spite of the higher education levels of lotto players, their income levels are lower than average. A greater proportion (58.7% vs. 52%) are employed, but their remuneration is not as great. The percentage of lotto players earning less than \$40,000 is 41.4%, and this is higher than the general population, at 33.5%. Fewer make between \$40,000 and \$80,000, but the levels are comparable at 34.2% for lotto players compared to 38.1% overall. At income levels above \$80,000, lotto players fall well behind in earnings, as only about two-thirds as many earn in that range.

The significant portion of Alberta residents who purchase lottery tickets are a little older than the provincial average and are just a little more likely to be male as female. They prefer to be in relationships, and divorce less frequently. They are better educated, but yet earn less than their non-lotto-playing counterparts. This is consistent with the fact that many lottery tickets have relatively small prizes, which would be attractive to individuals with relatively low income.

In summary, traditional lotto is the most popular game in Alberta. It has been accepted by the general public as having a good reputation as compared to other games such as VLTs. We find that the demographic profile of traditional lottery players to be less educated than the general public and have lower incomes which reflects the idea of winning the lottery as a “life altering event.” We speak more regarding scratch off lotto tickets in Chapter 16.

Table 13.3: Demographic Profile of Traditional Lottery Players

<b>Demographics</b>		<b>Income</b>	
Participants in 2008	1,506,518	less than \$40,000	41.4%
Participants in 2009	1,578,006	\$40,000-\$80,000	34.2%
Average Age	45.5	\$80,000-\$120,000	14.2%
Male	52.0%	more than \$120,000	10.2%
Employed Full Time	58.7%		
Student	7.5%	<b>Total Amount of Debt</b>	
		No debt	19.5%
<b>Marital Status</b>		less than \$10,000	21.1%
Single	17.6%	\$10,000-\$100,000	31.4%
Common-law	10.7%	More than \$100,000	28.1%
Legally Married	57.4%	% Debt from Gambling	17.0
Separated	3.2%		
Divorced	5.9%	<b>Racial/Ethnic Origin</b>	
Widowed	4.8%	Western European	69.9%
		Eastern European	12.9%
<b>Education</b>		South Asian	1.8%
Less than High School	9.1%	East Asian	2.8%
Completed High School	34.8%	Aboriginal	3.6%
Trade Degree	10.6%	African	0.3%
College Degree	18.2%	Latin American	0.9%
University Degree	26.6%	Other	7.8%

## 13.6 Problem Gambling Incidence Rates

Problem gambling is an important component of any SEIG analysis. We anticipate that research by the University of Lethbridge research team will address problem gambling among lottery players in Alberta in considerable detail. However, we have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult the University of Lethbridge report when it is made available.

## Chapter 14

# Horse Racing

### 14.1 Horse Racing in Alberta

Horse racing is presented in three formats in Alberta. Each format represents the efforts of a separate breed of horse, selectively bred and developed over generations to excel in its specialty. The primary classifications are thoroughbred, standardbred, and quarter horse.

Thoroughbred horses are piloted around an oval track by jockeys. They are a temperamental breed, and generations of refinement to the breed has resulted in graceful, muscular builds that mask the structural fragility of their limbs. In Alberta, the majority of thoroughbred racing takes place at Northlands Park in Edmonton. The races are each an exercise in pageantry, punctuated at intervals by ceremonious stakes races at which champions are drawn together in competition for enhanced purses.

Standardbred racing horses can be sub-divided into pacers and trotters, depending on which gait the horse is trained to run in. Albertan fields are dominated by pacers, the easier gait to master. Both types of standardbred are athletic, slightly longer than thoroughbreds, and possess a less mercurial disposition as well as a more robust skeletal structure. Standardbred racing evolved from informal rural competitions that pitted carriage horses from neighboring farms together. The carriages evolved into the current sulkies, two-wheeled carts drawn behind the racers with a single seat for the driver.

Quarter horses are stockier and muscular. They specialize in short, straight dashes, carrying a jockey at speeds up to 60 km/h. What quarter horses have in common with the other breeds is that they require deliberate breeding, comprehensive training and meticulous veterinary care. As well, they need carefully selected feed, specialized accommodation and transportation to and from

tracks and training facilities. They need saddles, harnesses, and the services of ferriers to keep them shod.

Horse racing in Alberta is synonymous with gambling. Throughout the first half of the twentieth century, with the exception of bingo games held in church basements, horse racing enjoyed a favoured position as the sole legal domestic venue for Albertans who wished to gamble. Although the industry faces stiff competition today from other gambling activities such as casinos, VLTs, lotteries and other forms of gambling, the basics of horse betting have not changed. The minimum win bet is the same now, at \$2, as it was half a century ago. Horse players gather and interpret information from a program, applying importance to such data as speed, age, jockey or trainer rankings, according to personal tastes or custom, and bet on a horse that they think will perform well.

The wagers are collected in a pool under a pari-mutuel system. The system uses the proportion of bets placed on individual horses to determine the odds and the payoffs for winning bets. The track that is hosting the race retains a certain percentage of each wager, usually from 15% to 25% depending on the type of wager. This is called the track take-out. Much of the take-out is transferred to federal or provincial coffers as a levy, and the remainder is retained by the track to defray the costs of presenting the races.

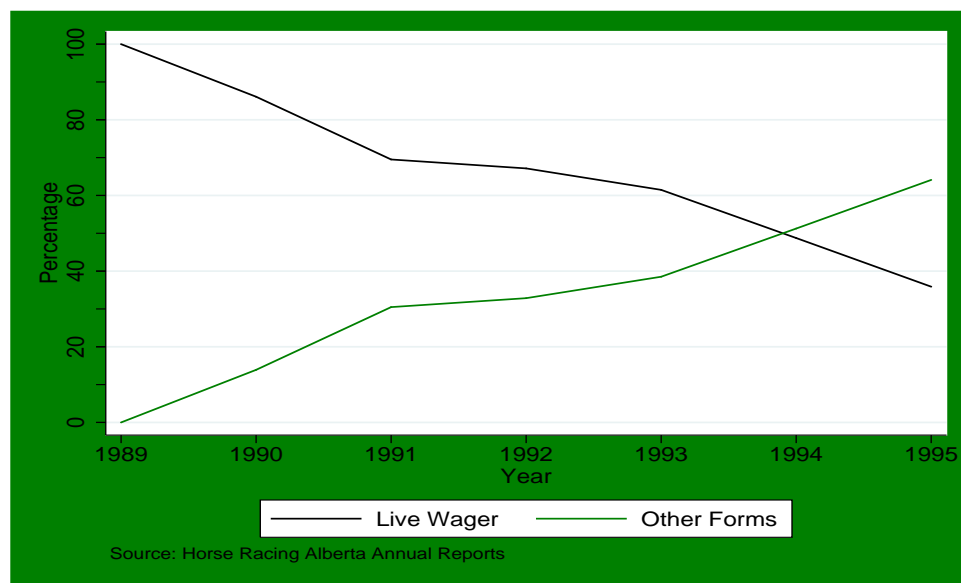
The motivation for owners to enter their horses in races, or even to own horses, must necessarily be more complex than the opportunity for financial gain. Horses race to win, and the winner collects the lion's share of the purse as its prize. As shall become evident later, the total sum of purses in a racing season falls well short of the total costs of racing that is borne by the owners. The particulars of current trends will be expanded on in a later section, but it is important to note now that purses, the available amount of prize money, are in decline. The consequence is that fewer horses of all breeds are sired, purchased and trained as racers, and many horse owners and trainers are taking their stock and expertise out of the province to race elsewhere. Another trend that is inescapable, and will also be expanded upon later, is the decline in racing handle. This is the amount wagered by the public on each race, and from which the tracks extract their operating money. In many cases, the total handle is less than the purse for which the race is being run. This situation would be unsustainable if it were not for special considerations and provisions allowed to the horse racing industry by the province.

The primary source of funds for purses comes from racinos. The word 'racino' is a hybrid that captures important syllables of 'racing' and 'casino', and is in fact a small casino offering slot machines that is featured at racetracks in Alberta and elsewhere. The combined track and racino is often referred to as a racing entertainment centre (REC). The AGLC currently licenses 650 slot machines at Northlands, which gets to keep 15% of revenue. The rest of the revenue is returned to AGLC who in turn transfer 55% to Horse Racing Alberta (HRA) through the Alberta Lottery

Fund (ALF). The balance, 30%, is pooled in the ALF with other lottery and VLT revenue and distributed for public benefit.

A recent and important feature of RECs is the availability of simulcast wagering, which also represents another significant proportion of funding for purses. Simulcast refers to the simultaneous broadcast of horse races, coupled with the ability to handle wagers from many different locations in a common pool. For instance, bettors in Edmonton can bet on races at other tracks, such as Woodbine in Toronto, or Santa Anita in California, and watch the races in real time, while attending live races at Northlands Park. Likewise, bettors at different locations in North America can watch and wager on races held in Edmonton. Figure 14.1 shows how live and simulcast wagers compose the total wager. The data is from 1989-1995 which is the beginning that other forms of betting on horse racing were introduced. The figure illustrates how other forms of wagering besides live is composing more of the total wager.

Figure 14.1: Percentage Of Total Wager



Horse racing in Alberta is rich in history and tradition. Once very popular and facing little or no competition for Albertans' gambling dollars, racing is now facing significant challenges from casinos, VLTs and a myriad of other gambling, leisure, and entertainment diversions presented to Albertans. As a result, the industry is heavily subsidized, and this is a matter of considerable concern. The discussion of the complexities of horse racing will continue with an examination of racing venues available in Alberta, the regulations that govern the industry and safeguard the interests of the betting public, and elaboration of the trends mentioned to this point. From there a detailed summary of revenues and expenditures will offer a means to measure and appreciate the social and economic impact of this sport.

## 14.2 Availability of Horse Racing

With the termination of racing operations at Calgary's Stampede Park in 2008, live racing in Alberta is currently available at one "A" track, Northlands Park in Edmonton. The lack of a major track has seriously impacted the racing industry in Southern Alberta, and the planned opening of a new track at Cross Iron Mills, near Balzac (north of Calgary) has been delayed for several years. With no replacement on the horizon, the demand for racing venues is stimulating development of community and "B" tracks. One such track opened at Lacombe, north of Red Deer, in 2009. Another is in development near Medicine Hat. These tracks add to the existing complement of Evergreen Park in Grande Prairie, and Whoop-up Downs in Lethbridge.

Even with the new tracks being developed a sense of unease (if not crisis) is present in the horse racing industry and among strong horse racing supporters. Northlands Park now hosts thoroughbred racehorses for the entire racing season, which extends from early May until mid-October. This has resulted in the curtailment of standardbred racing in spring and autumn. To compensate for the abbreviated schedule, the horses and the supporting staff are relegated to such tracks as Evergreen Park, some 450Km north west of their customary racing venue in Edmonton. Although they have regained some of their racing days, the horsemen incur additional expenses and considerable inconvenience. Some have taken their stock to what they consider more hospitable jurisdictions in Ontario and British Columbia (*Edmonton Journal*, 2008). The opening of Alberta Downs at Lacombe alleviates some of the motivation to leave the province, but the new track has so far shown itself to be prone to damage from inclement weather. Sadly, the developers of the hoped-for track at Cross Iron Mills, after constructing state-of-the-art facilities to accommodate racehorses, have applied for and received creditor protection (Horse Racing Alberta, 2009). The future of that project remains less certain than the future of the racing industry itself. Despite its growing reliance on slot revenue from a depleted stock of on-track racinos, the industry shows every determination to survive and grow.

Over the past five years, there have only been 3 racing entertainment centres (REC's or Racinos) present in Alberta, according to the latest Alberta Gaming and Liquor Commission Annual Report. They are located in Edmonton (Northlands), Calgary (Stampede), and Lethbridge (Rocky Mountain Turf Club). In addition to the three racinos in the province, there are a number of off-track betting locations. These locations televise many horse races across North America and allow patrons to bet on these races. According to Northlands website,<sup>1</sup> there are currently 12 off-track betting establishments in the Edmonton region and 27 in the rest of the province. Most of these 27 locations are in rural Alberta. The website does not show three facilities in Calgary that currently offer simulcast wagering. The locations are a bar in North Calgary, a bar in South Calgary, and the Elbow River Casino.<sup>2</sup>

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<sup>1</sup><http://www.thehorsesofftrack.com/locations/location-listings>

<sup>2</sup>See <http://www.thehorses.com/industry/alberta-racing-information/industry-links/75-calgary-simulcast-locations> for details.

## 14.3 Profile of Horse Racing Gambling Participants

Table 14.1 presents the demographic profile of horse race bettors in Alberta, based on data from the 2008 and 2009 population surveys carried out as part of this research project.<sup>3</sup> This profile is based on survey data that has been weighted to adjust the sample to match the age-sex population of Alberta based on the 2006 Census.

The participation rate of Albertans in horse racing is quite low at 4.5%. Horse players are slightly older than average at 44.6 years old, 2 1/4 year older than the average Albertan. In terms of gender, proportionally more males (64.9%) are involved in gambling at racetracks than are representative of Alberta residents (50%). They are less likely to be single and more likely to be married. Only 18.1% of horse players declare themselves as single, whereas 34% of Albertans residents claim to be, and almost 56% of them are married compared to 51% of Albertan couples. Horseplayers seem overall to have taken advantage of educational opportunities. Although nearly 30% have only completed high school, compared to about 24% among the general population, only 4.8% have less than a high school diploma, compared to 15.4%. Slightly more horseplayers have college level trades training (13.9% vs. 12.4%) but otherwise seem to have preferred university to college. Of racetrack attendees, 20.5% will have a college education (compared with 21.5% of Albertans in general), but 30.6% will hold a university degree (22%).

Employment figures are higher for race-goers than residents of Alberta in general. Their employment rate is 68.8%, quite a bit higher than the provincial average of 52%. Despite their academic qualifications, horseplayer do not make appreciably more than other Albertans on average. Just slightly fewer than average make less than \$40,000 per year (32.2% vs. 33.5%), but above that the differences are difficult to distinguish from the data available. The percentage of debt that comes from gambling is 32.5 percent which is the highest among any game we surveyed. One reason is that horse races are running for 24 hours and the uncertainty of race outcome, the belief that the outcome is not predetermined, keeps both heavy and light gamblers interested in this type of gambling activity.

Gamblers at racetracks are likely to be older males, married and educated. They are likely to be employed, and if there is any difference in earning, they seem to earn slightly more than the average Albertan.

## 14.4 Distributions of Revenues

Horse racing is different in many ways from other forms of gambling available to the public. One way is that horse racing involves both risk and uncertainty. Gambling at casinos, slots, dice and cards

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<sup>3</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.



Table 14.1: Demographic Profile of Horse Race Bettors

<b>Demographics</b>		<b>Income</b>	
Participants in 2008	143,607	less than \$40,000	32.2%
Participants in 2009	124,501	\$40,000-\$80,000	36.7%
Average Age	44.6	\$80,000-\$120,000	19.0%
Male	64.9%	more than \$120,000	12.1%
Employed Full Time	68.8%		
Student	5.2%	<b>Total Amount of Debt</b>	
		No debt	21.8%
<b>Marital Status</b>		less than \$10,000	24.5%
Single	18.1%	\$10,000-\$100,000	26.1%
Common-law	9.9%	More than \$100,000	27.7%
Legally Married	55.9%	% Debt from Gambling	32.5
Separated	2.0%		
Divorced	8.5%	<b>Racial/Ethnic Origin</b>	
Widowed	4.7%	Western European	76.3%
		Eastern European	11.5%
<b>Education</b>		South Asian	1.2%
Less than High School	4.8%	East Asian	1.1%
Completed High School	28.9%	Aboriginal	0.8%
Trade Degree	13.9%	African	0.0%
College Degree	20.5%	Latin American	0.4%
University Degree	30.6%	Other	8.8%

all certainly involve risk, but since the probabilities have been calculated and are publicly available there is no uncertainty as to the outcome. The element that brings uncertainty to horse racing is horse itself. The performance of a single living creature is difficult enough to predict, let alone a field of them thundering and interacting along a stretch drive. The horse not only brings uncertainty to the outcome of the race, but also generates expenses to horse owners that other forms of gambling do not have. Racing is an expensive sport, and making this form of gambling available requires a constant infusion of revenue to feed, train, transport, groom and equip a racehorse and driver or jockey. Consequently, horse racing diverges from Alberta's charitable gaming model. Instead of operating on behalf of charities and non-profit groups directly, the revenues from racing activities and racinos are returned to the residents of Alberta indirectly through the financial interactions within the industry. The funds are returned to the horse owners and re-enter the economy as wages or purchases of supplies or services.

Due to the tremendous contribution that the racing industry brings to the province, it is enough that revenues raised from RECs, entry fees and wagering handles are returned to the horse owners in the form of purses. The question soon becomes, is this enough for the horse-owners? This question has some powerful implications, among which is degree of confidence that horsemen have in the

viability of the industry. This confidence is often measured in the price that they are willing to pay for a yearling. Over the past year (in 2009), the prices received for thoroughbred and standardbred yearlings have dropped 12.5% and 14.6% respectively. This implies less income for breeders, which is a disincentive for them to continue supplying the market with high-quality young horses.

With the drawing down and eventual cessation of racing at Stampede Park, Alberta's racing handle (including Alberta simulcast) fell more than half from \$41.3 million in 2006 to just under \$20 million in 2009. The critical contribution of revenue from RECs to Horse Racing Alberta declined from \$36 million to less than \$28 million between 2008 and 2009. This precipitous decrease necessitated substantial reductions in available purses. In fact, the total purse fell from \$32 to \$24 million. This includes a contribution from the Breed Improvement Program (BIP) that is hoped to offset the discouragement that breeders and buyers might feel about respectively rearing and purchasing Alberta-bred foals and yearlings. The BIP funds are supplements to races for Alberta-bred horses. Otherwise, the purses are distributed heavily in favour of thoroughbred racers. They receive \$10.4 million and standardbred horses compete for \$4.2 million. Another \$5.3 million is available for racing of all breeds at Alberta's smaller community tracks, and as well, another \$4.3 million BIP. While this seems a considerable sum, the aggregate amount is insufficient to cover the many costs associated with racing, from entry fees to veterinarian bills, transport, training, feed and accommodation, and the survival of the industry is dependent on many owners who continue to participate despite the unlikelihood of recovering their expenses.

Horse Racing Alberta (HRA) not only disburses funds to purses and the BIP, but also contributes a considerable amount of its revenue towards the racetracks themselves. As Alberta's only "A" track, Northlands received \$10.4 million, and a further \$3.2 million was spread around Alberta's "B" and community tracks to support racing activities and the facilities themselves in 2009. With continued support, the belief is that the vacuum left in Southern Alberta with the closure of Stampede Park will be somewhat mitigated. Not only will this help distribute HRA funding more evenly around the province, but also will capture more of the provincial wagering and horse-playing market that has become heavily reliant on the single urban centre of Edmonton.

In summary, horse racing has a long tradition in Alberta and contributes significantly to the well-being, livelihood and entertainment of many Albertans. The revenues received by HRA, including the diminished but substantial contribution from the RECs, amounted to about \$37 million in 2009. Roughly 10% of that was retained to finance administrative and operating expenses by HRA, and the rest was returned to horsemen or backstretch employees as purses, breed improvement supplements, training subsidies or industry marketing.

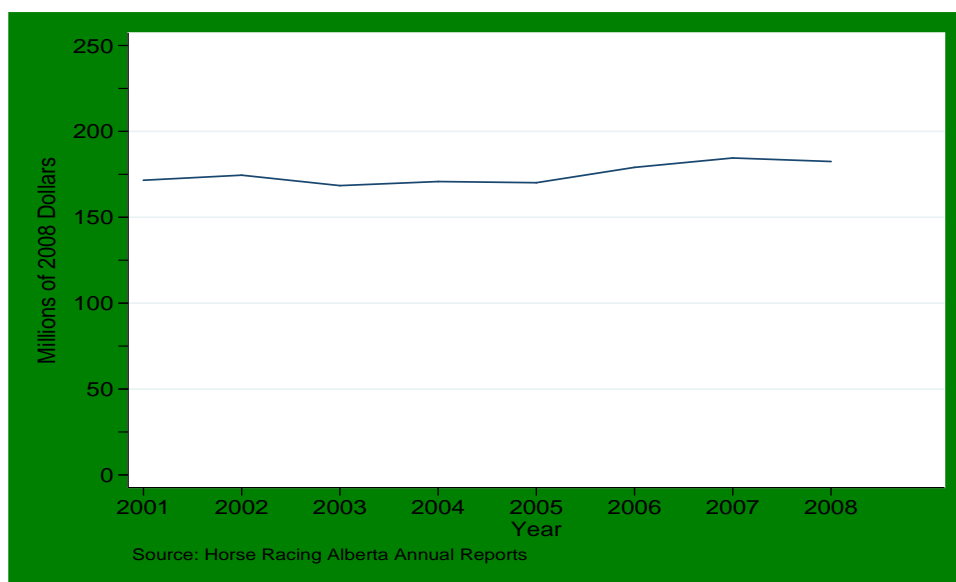
## **14.5 Total Wager and Slot Racing Revenue from Horse Racing**

We do not have direct revenue, expenditure, and net sales data for horse racing as we do for other gaming types such as lotteries and VITs. However, we are able to present the total provincial wager

and the revenues generated from slot machines. These two revenue streams form a sizeable portion that goes to the ALF for distribution.

Figure 14.2 presents the current total provincial wager per year for horse racing in the province. The years in the sample are 2001 through 2008 (inclusive). Figure 14.2 shows that the total wager remains steady around 175 million of 2008 dollars. However, this total is considerably lower than it was in the early 80s and mid 1990s when the total wager was approximately 500 million and 225 million respectively.

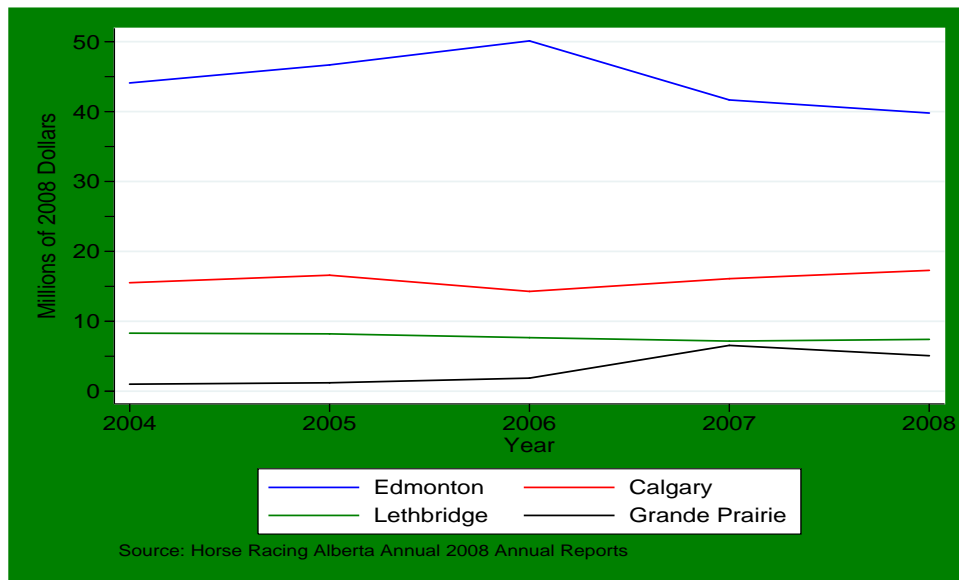
Figure 14.2: Total Provincial Wager for Horse Racing 2001-2008



One of the reasons for placing slot machines at racetracks was due to the decreasing attendance and revenue from horse racing. From the Horse Racing Alberta Annual Reports, we know how much money horse racing receives from slot machines from each track. According to Northlands (2007) Annual Report, Horse Racing Alberta receives 51.67% of the slot revenue. The rest of the revenue is distributed to the track itself (15%) and to AGLC (33.33%). As a result, we take the figure provided in the HRA annual report and divide it by 0.5167 to get the total revenue from each racino. This does not account for the winnings paid out from these slot machines, but does provide an idea of how much revenue slot machines at racinos generate in the province. Figure 14.3 and 14.4 presents the breakdown of total revenue from four racinos in the province while Figure 14.4 compares the total revenue from slot machines at racinos to the total handle.

Figure 14.3 presents the slot revenue comparison by the four cities that the Horse Racing Alberta Annual Reports states have slot revenue. From the figure, one notices that Edmonton generates close to 50 million dollars (in 2008 real dollars) per year from slot revenue alone. Edmonton though has been in decline since the 50 million mark in 2006. Calgary, Lethbridge, and Grande Prairie all

Figure 14.3: Total Slot Revenue from Alberta's Race Tracks 2004-2008



generate less than 20 million dollars in total revenue. We do not know how many machines are at each location per year so we are unable to provide a breakdown of the average revenue per machine.

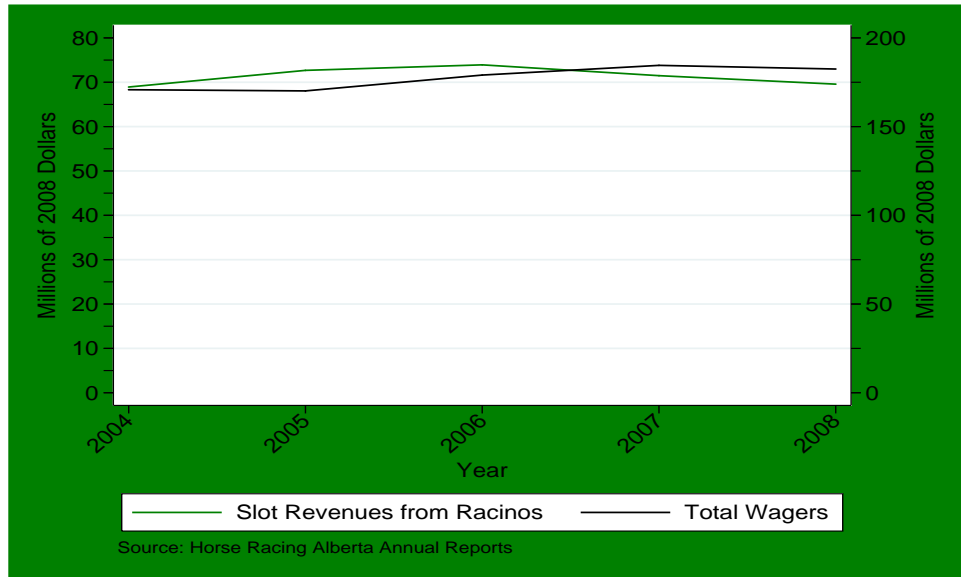
## 14.6 Current Trends

Two of the important research questions in this area today is the effect that slot machines have on the handle at racetracks and the effect that simulcast wagering has on live wagering.

Figure 14.4 presents a comparison of the total revenue generated from slot machines at racinos to the total provincial handle. The values expressed in Figure 14.4 are in 2008 dollars. In examining Figure 14.4, one notices that total revenue from slot machines increased slightly until 2006 and declined since that time. Total handle though increases throughout the time period. In examining the 2008 HRA Annual Report, HRA is warning of a sharp decline in the slot machines revenues. The projections had a decline of around 10 percent. However, we do not have enough data currently to conduct a more rigorous statistical analysis of the relationship between slots and the live handle.

Humphreys, Soebbing, and Turvey (2009) examined the affect that international simulcast wagering has on the live handle at the top 18 grossing race tracks in Canada from 1999 through 2006. Controlling for such factors such as field size, average purse, city characteristics, and the prices for live and simulcast racing, the results showed that the presence of simulcast racing has no effect on the live handle at these Canadian tracks.

Figure 14.4: Comparison of Slot Revenue and Total Provincial Wager from Racinos



## 14.7 Problem Gambling Incidence Rates

Problem gambling is an important component of any SEIG analysis. We anticipate that research by the University of Lethbridge research team will address problem gambling among horse race gamblers in Alberta in considerable detail. However, we have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult the University of Lethbridge report when it is made available.

# Chapter 15

## Bingo

### 15.1 Bingo in Alberta

In the 2002 gambling survey, Smith and Wynne (2002) report that bingo was the eighth most popular gambling form in the province. As we have mentioned above, bingo is in a state of decline in the province from both a supply and charity point of view. As a result, bingo may be lower on the popularity scale than in Smith and Wynne's (2002) study.

### 15.2 Availability of Bingo in Alberta

The latest AGLC annual report (2008-2009) presents the number of bingo establishments in the province. There are two forms of bingo facilities: association and private operated. Table 15.1 presents the number of bingo venues over the past five years according to the latest AGLC annual report.

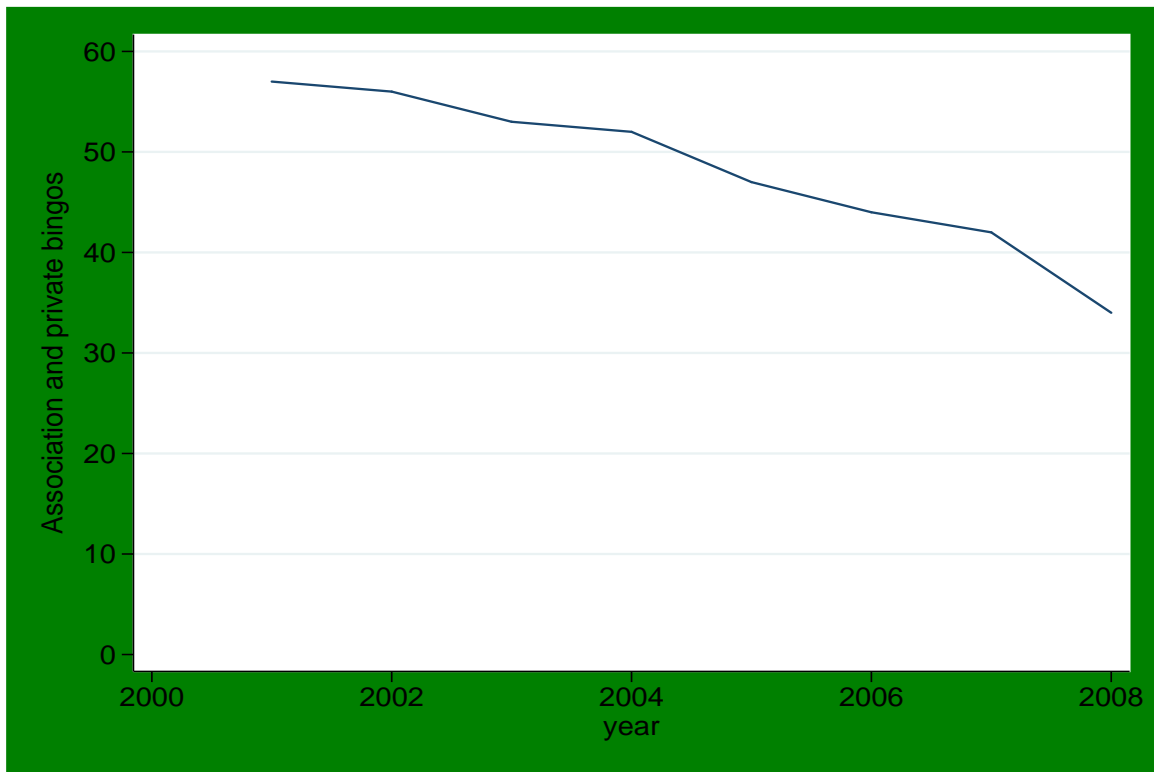
Table 15.1: Number of Bingo Facilities in Alberta: 2004-2008

Year	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009
Associated Bingo	54	46	43	40	33
Private Operated Bingo	0	1	1	2	1
Total Bingo Facilities	54	47	44	42	34

Table 15.1 shows a steep decline in the number of bingo facilities in the province (54 in 2004-2005 to 34 in 2008-2009). This represents an overall decrease since 1998 when the province had

64 bingo facilities. Figure 15.1 shows the number of associated bingo facilities in the province for a longer period of time. From the figure, one can notice the steep decline in the supply of bingo venues in the province. Although the decline in 2008 may have been precipitous, it was not entirely unexpected. A contributing factor may have been a province-wide smoking ban that went into effect. In that year Alberta became the last Canadian province to ban smoking in public, and the president of the Alberta Federation of Bingo Association this would have adverse consequences, especially for small town bingo associations and the charities that benefited from them.

Figure 15.1: Association and Private Bingo Venues in Alberta: 2001-2009



### 15.3 Distribution of Charitable Bingo Revenues

Table 15.2 contains the charitable revenue generated from bingo by location from the AGLC Annual Reports. Revenues are in millions of 2008 dollars. The reports contain revenue data for Calgary, Edmonton and all other location in the province.

Bingo in Alberta has been in a continuous state of decline since its peak in the late 1990s. Bingo is played in either dedicated halls under license to associate charities, or in facilities run by private operators on behalf of the charities. Almost ninety percent of bingo revenues originate from

Table 15.2: Charitable Revenue from Bingos by Location (millions of 2008 Dollars)

Year	Revenue By Location			Total
	Calgary	Edmonton	Other	
1996	14.99	20.41	35.56	70.96
1997	14.98	21.01	37.54	73.54
1998	15.38	22.00	36.39	73.77
1999	14.63	19.37	33.26	67.26
2000	13.16	17.62	29.27	60.05
2001	12.31	17.31	29.18	58.80
2002	10.75	14.77	27.24	52.77
2003	9.88	13.48	25.84	49.20
2004	8.11	12.87	23.30	44.29
2005	7.30	7.58	21.95	36.83
2006	6.96	6.06	18.47	31.49
2007	5.49	5.33	15.74	26.56
2008	2.11	3.96	9.04	15.11

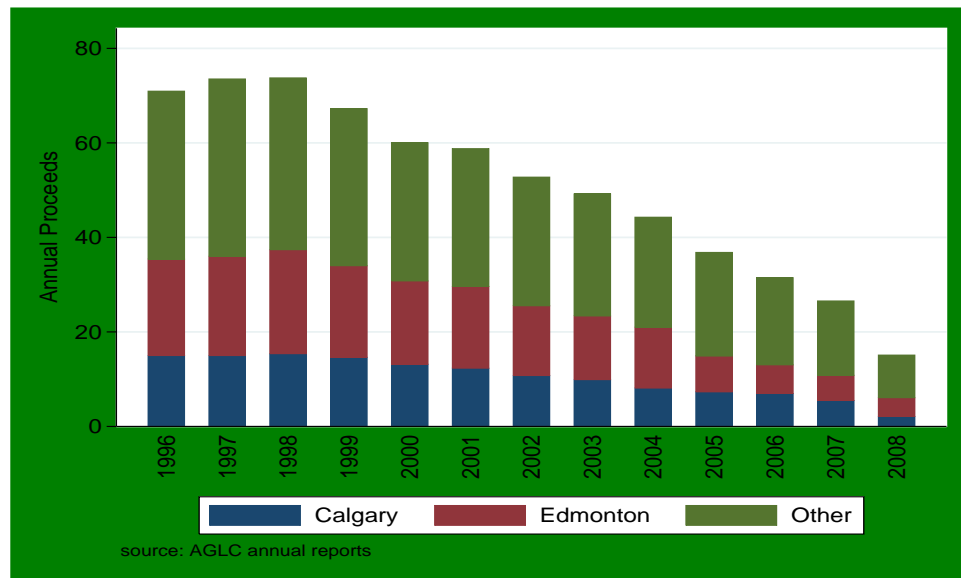
association facilities. In addition to bingo, both types of facility may be licensed to offer pull-tickets and/or keno. Table 15.2 clearly shows the decline in bingo. Over this period, bingo generated about \$600 million in charitable proceeds, almost exactly one third of the value of \$1.8 billion in charitable proceeds generated by casinos over the period documented in Chapter 11 on page 195. Proceeds from charitable bingos in 2008-2009 were just over \$15 million, down 43 percent from the previous year, a huge single year decline, and a fraction of the \$70 million per year in charitable revenues that bingo generated in the mid 1990s. The number of bingo venues has decreased as declining revenues and attendance levels are increasingly unable to sustain them. Interestingly, bingo generated twice the charitable proceeds that casino gambling generated in 1996, but while charitable revenues from bingo declined continuously over this period, charitable revenues from casinos increased. By 2008, charitable proceeds from casinos were more than 10 times the size of charitable revenues from bingo.

Figure 15.2 shows the proceeds to charities from bingo from three geographical locations: Edmonton, Calgary, and other areas. The figure further displays the decreasing trend of charitable proceeds from bingo as no geographical location shows stability or an increasing trend in charitable proceeds from bingo. Charitable bingo revenues held steady in the mid 1990s in all locations, but by the turn of the century the decline was underway in all areas of the province. The declines in larger urban areas (Edmonton and Calgary) outpace declines elsewhere in the province. This suggests that urban areas offer more gambling alternatives to bingo players. As more players substitute away, charities in search of gaming revenues may increase the demand for alternatives, such as casinos.

The decline in charitable revenues from bingo may have important inter-regional impacts on the provision of charitable services in the province. There were many more bingo halls than casi-



Figure 15.2: Total Proceeds to Charities from Bingos in Alberta



nos in the province, and casinos tend to be located in large cities while bingo halls were more evenly distributed across the province. The decline in bingo halls and increase in casinos concentrates the generation of charitable revenues in larger cities, and may make it difficult for charitable organizations in smaller, less populated areas to raise operating funds.

## 15.4 Profile of Bingo Participants

Table 15.3 presents the demographic profile of bingo players in Alberta, based on data from the 2008 and 2009 population surveys carried out as part of this research project.<sup>1</sup> This profile is based on survey data that has been weighted to adjust the sample to match the age-sex population of Alberta based on the 2006 Census.

Participation in bingo in Alberta is low. Only 5% of the population participated in bingo in 2008 and 2009 which places it seventh out of eight games surveyed in Table 18.1. From Table 15.3, the average bingo player in Alberta was 44 years old, slightly older than the provincial average of 42. 70% of bingo players are female, while the province has a 50-50 male-female proportion. Single people are less likely to participate in bingo; the proportion of single people in Alberta is 31%. High school graduates are more likely to participate in bingo, and college and university graduates less likely to participate (24% of Albertans have only a high school degree, while 44% of bingo players

<sup>1</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.

have only a high school degree.) Bingo is clearly a game preferred by people with lower incomes. Nearly 70% of bingo players reported their income was under \$40,000 per year while the proportion of residents of the province with that level of income is 33.5%. Aboriginals, who make up 8% of the population in the province, make up 14% of bingo players. The percentage of debt from gambling by bingo players is almost 19 percent. This is one of the higher percentages amongst the game.

Compared to other gamblers, bingo players are female, relatively old, make less than 40,000 dollars, and less educated. The overall state of bingo in the province is in the decline based upon what we find here and in Chapter 10.

Table 15.3: Demographic Profile of Bingo Players

<b>Demographics</b>		<b>Income</b>	
Participants in 2008	137,863	less than \$40,000	68.9%
Participants in 2009	128,800	\$40,000-\$80,000	14.6%
Average Age	44.3	\$80,000-\$120,000	10.6%
Male	30.6%	more than \$120,000	5.9%
Employed Full Time	40.1%		
Student	14.1%	<b>Total Amount of Debt</b>	
		No debt	20.9%
<b>Marital Status</b>		less than \$10,000	30.2%
Single	23.0%	\$10,000-\$100,000	35.1%
Common-law	13.4%	More than \$100,000	13.8%
Legally Married	44.1%	% Debt from Gambling	19.1
Separated	1.3%		
Divorced	7.6%	<b>Racial/Ethnic Origin</b>	
Widowed	9.7%	Western European	57.4%
		Eastern European	13.3%
<b>Education</b>		South Asian	0.2%
Less than High School	13.3%	East Asian	5.5%
Completed High School	40.9%	Aboriginal	14.2%
Trade Degree	4.0%	African	%
College Degree	22.8%	Latin American	0.8%
University Degree	17.7%	Other	8.5%

## 15.5 Problem Gambling Incidence Rates

Problem gambling is an important component of any SEIG analysis. We anticipate that research by the University of Lethbridge research team will address problem gambling among bingo gamblers in Alberta in considerable detail. However, we have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult the University of Lethbridge report when it is made available.

## Chapter 16

# Scratch Offs, Pull Tickets, and Raffles

Albertans have access to a variety of “instant” gambling games. These include scratch off lottery tickets sold in Lottery Ticket Centres, pull tickets, and raffles. Scratch off tickets are lottery tickets where participants can instantly “scratch off” or uncover numbers or symbols to see if they have won a prize; the results of the gamble can be determined immediately after the purchase of the ticket. In comparison to lottery, the prize amounts paid to winning scratch off lottery tickets are not as large as those paid to winning tickets in traditional lotteries. Pull tickets are instant win products characterized by sealed windows that the buyer opens to reveal symbols or numbers that identify winning and losing tickets. Pull tickets are sold under license by charitable or non-profit groups, usually at a public-use facility like a bingo hall. Raffles are a type of lottery where prizes are awarded based on the random draw of tickets purchased. For instance, the typical 50/50 draw at a local sporting event is classified as a raffle, and requires a license. Charities operating raffles must be registered with the AGLC to get a license, and they keep all the proceeds they earn from raffles after operating expenses.

In this section we examine the socioeconomic impact of these “instant” games in the province and present a demographic profile of “instant” game participants in the province, based on the population surveys carried out as part of this research.

### 16.1 Scratch Off Lottery Ticket Gambling in Alberta

Currently, the Western Canadian Lottery Corporation (WGLC) offers nearly two dozen different scratch off lottery games (WGLC terms these game “Scratch ’n Win” products). There is considerable variation in the top prize money awarded amongst each of these games. However, the top prize money does not come close to matching the top prize money given out in traditional lottery

which is typically in the millions of dollars. Some top prizes in scratch off tickets can be in the hundreds of thousands of dollars and a few games have top prizes of 1 to 2 million dollars. Most of the prizes are relatively small, and anecdotal evidence indicates that most participants use the prize money to immediately buy more scratch off tickets. The WCLC website lists the number of outstanding winning tickets at each prize level for each game. These lists are updated constantly, providing players with information about the amount of winnings remaining in each game.

In Chapter 13, we discussed the recent investigation by AGLC regarding lottery prize claims. Scratch off lottery tickets fell within this investigation. The policy changes and implications that resulted from this investigation applies to scratch off lottery ticket games since scratch off tickets are sold at the same lottery ticket centres as traditional lottery tickets. Also some implementations apply directly to lotto such as a background check on players who win over 1,000 dollars on a single game.

## **16.2 Raffle Ticket Gambling in Alberta**

Raffles are a type of lottery where prizes are awarded based on the random draw of tickets purchased. For instance, the typical 50/50 draw at a local arena is a raffle, and requires a license. Charities must be registered with the AGLC to obtain a license, and they keep all the proceeds they earn from raffles after operating expenses. The AGLC issues licenses for raffles with total ticket values over \$10,000, whereas Alberta Registries issue licenses for smaller amounts

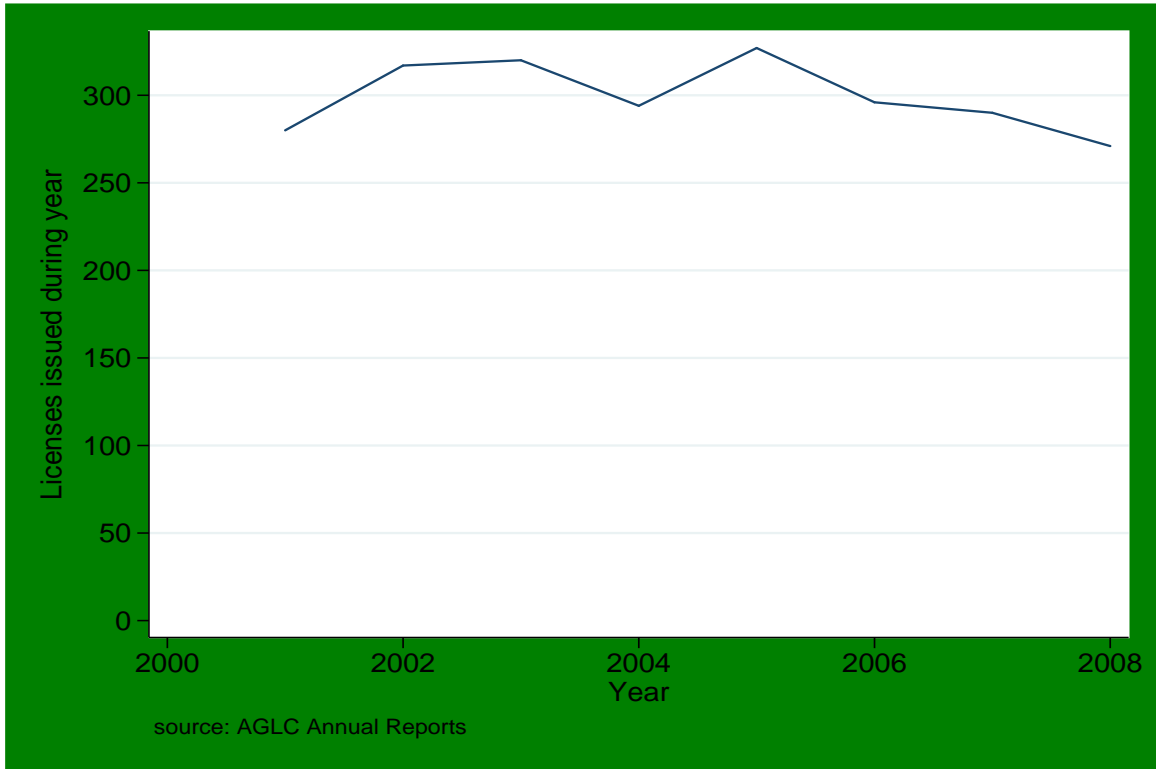
### **16.2.1 Availability of Raffles**

We are able to report the number of raffle licenses issued in each year. For raffles, AGLC partitions licenses above and below \$10,000. Figure 16.1 shows the number of licenses issued for raffles over \$10,000. The number of relatively large raffle licenses issued remained relatively constant over the 200 to 2008 period, with a slight decline in the last few years.

Beginning with the 2006 annual gaming report, AGLC reported the number of raffle licenses issued for total ticket values under \$10,000. Table 16.1 shows the number of licenses issued for above and below the \$10,000 threshold.

From Table 16.1, there were over 20,000 raffle licenses issued in the province over the past three years with over 7,000 issued in the 2008-2009 fiscal year. We are unable to determine the distribution of those raffle licenses by geographical area but it would be interesting to examine how those are divided up within Alberta and the relation of them to other gambling activities such as casinos and VLTs.

Figure 16.1: Charitable Raffle Licenses Issued (over \$10,000)



### 16.2.2 Distributions of Charitable Raffle Revenues

Table 16.2 summarizes charitable revenues raised by raffles over the period 1996 to 2008. The table contains information on total charitable raffle proceeds in Edmonton, Calgary, and the rest of the province expressed in 2008 dollars, and comes from AGLC Annual reports. Charitable proceeds from raffles grew steadily in inflation adjusted terms, but not as rapidly as charitable proceeds from casinos. In total, about \$462 million in charitable raffle proceeds were generated over the period 1996 to 2008, less than from bingo (\$600 million) or casinos (\$1.8 billion).

Figure 16.2 displays the information on Table 16.2 graphically, making it easier to see the

Table 16.1: Number of Raffle Licenses Issued Above and Below \$10,000

Value/Year	2006	2007	2008	Total
Under \$10,000	6,339	6,326	6,791	19,456
Over \$10,000	296	290	271	857
Total	6,635	6,616	7,062	20,313

Table 16.2: Charitable Revenue from Raffles by Location (millions of 2008 Dollars)

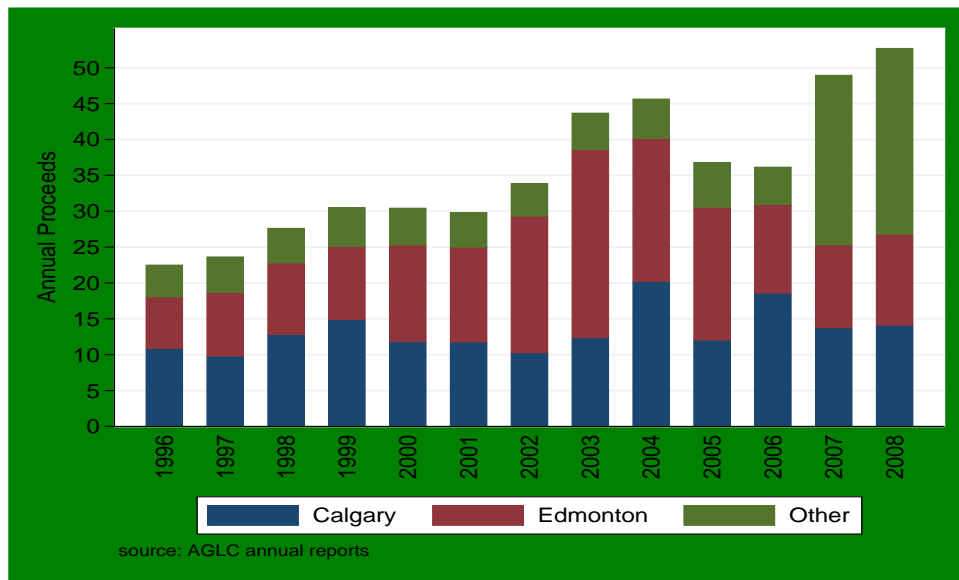
Year	Revenue By Location			Total
	Calgary	Edmonton	Other	
1996	10.87	7.18	4.44	22.50
1997	9.79	8.91	4.93	23.63
1998	12.84	9.93	4.84	27.62
1999	14.90	10.18	5.45	30.52
2000	11.81	13.47	5.15	30.43
2001	11.77	13.21	4.83	29.80
2002	10.26	19.05	4.56	33.87
2003	12.38	26.21	5.09	43.68
2004	20.21	19.94	5.50	45.65
2005	12.03	18.51	6.27	36.81
2006	18.57	12.39	5.19	36.14
2007	13.75	11.55	23.65	48.95
2008	14.10	12.68	25.92	52.70

relative contributions made by raffles in different areas of the province. While charitable proceeds grew slightly in Calgary and Edmonton, most of the growth late in the period can be attributed to increases outside the two major cities. The increase in charitable proceeds from raffles outside Edmonton and Calgary actually masks a decrease in proceeds in those two cities in the last few years. This increase in charitable proceeds from raffles outside Edmonton and Calgary may be due to the corresponding decrease in charitable proceeds from bingo documented in section 15.3 on page 234 of Chapter 15.

The upward trend in charitable raffle proceeds was interrupted for 2005-2006 and 2006-2007 fiscal years according to Table 16.2, but has increased since that period of time. Notably, the proportion of proceeds from outside Alberta's two main population centres, Edmonton and Calgary, increased appreciably in the same two years according to Table 16.2 and Figure 16.2. This corresponds to the pull ticket proceeds coming mainly from outside the two major provincial centres. As a result, one could hypothesize that cities outside the major centres are turning more to pull tickets and raffles as forms of gambling.

The latest figure from the 2008-2009 AGLC Charitable Gaming Report shows \$52.9 million in charitable proceeds from raffles. This amount is based on raffle ticket sales of \$133 million from which \$52.2 million in prizes were returned to ticket purchasers. Of the remaining amount, \$27.4 million were approved expenses. This shows the considerable amount of ticket purchases required to generate these net proceeds.

Figure 16.2: Total Proceeds from Raffles in Alberta



## 16.3 Pull Ticket Gambling in Alberta

Pull tickets are instant win products characterized by sealed windows that the purchaser opens to reveal symbols or numbers that may signify the winning of a prize. These tickets are sold under license by charitable or non-profit groups, usually at their public-use facility. Pull tickets are closely monitored and inspected by AGLC to ensure fairness and compliance with their specifications.

In 2008-2009, 458 licenses to sell pull tickets were issued to charities, veteran and fraternal groups. These licenses are in effect, in most cases, for two years. The current year licenses, and the unexpired licenses from 2007-2008, totaled 457. The amount sold totaled just over \$67 million, which earned almost \$15 million in charitable proceeds. This was an exceptional year that dramatically reversed an earlier downward trend in pull ticket revenues.

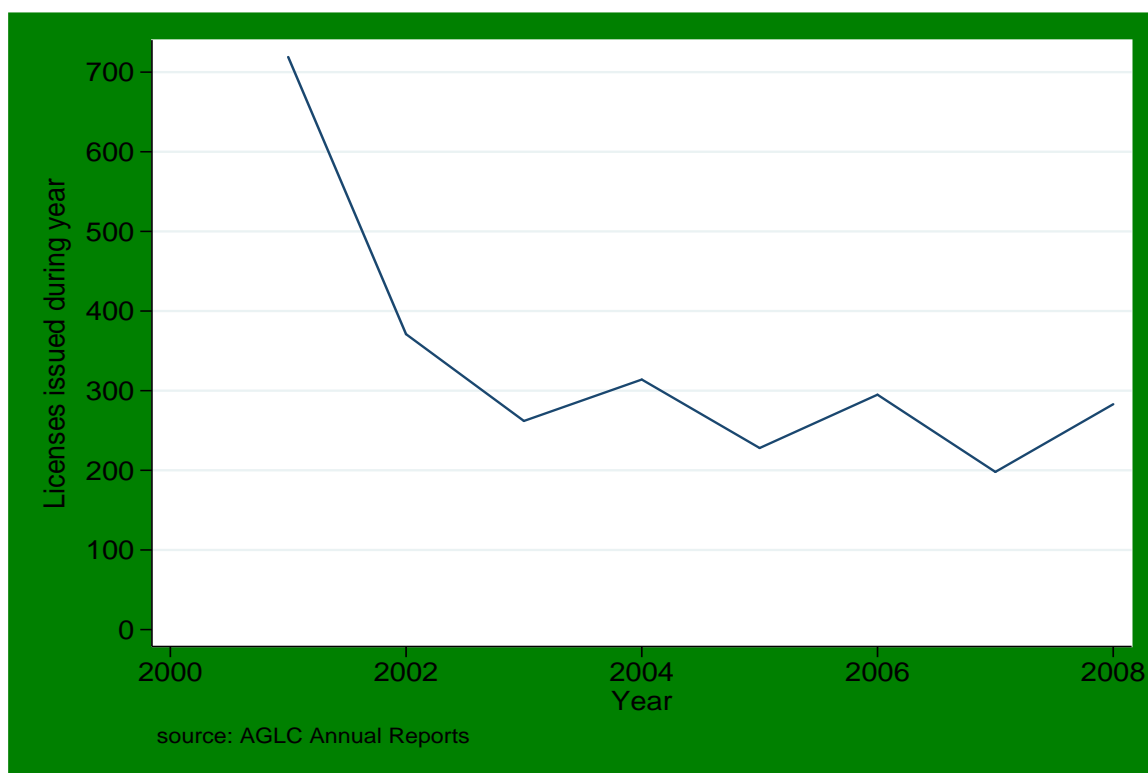
It may be possible to explain this surge in sales as a de-coupling of pull ticket sales and bingo events. There has been a strong connection between the two, but if bingo is declining so much, it could have been suppressing pull ticket sales, so charitable groups may have found a more effective way of marketing pull tickets outside of bingo venues. This is something that future research can examine more in depth.

### 16.3.1 Availability of Pull Tickets in Alberta

The AGLC annual reports contain information on the number of pull tickets licenses that issued in each year. Pull ticket licenses are in force for two years. Figure 16.3 shows the number of licenses

AGLC issued from 2001-2009. Technically, AGLC could grant an unlimited number of pull ticket licenses, so Figure 16.3 shows total demand for pull tickets in the province over the sample time period. As Figure 16.3 shows, the number of licenses granted has decreased from its high in the 2001-2002 fiscal year to a current level of 283. 2007-2008 saw the lowest number of pull ticket licenses issued at 198. The number of licenses issued for 2001 (719) may reflect the total number of licences active during that year, as the AGLC data for that year is ambiguous, and the proceeds from ticket sales (Table 16.3) are higher but otherwise in line with other years around that time.

Figure 16.3: Pull Ticket Licenses Issued in Alberta: 2001-2009



### 16.3.2 Distribution of Charitable Pull Ticket Revenues

The final column on Table 16.3 shows the charitable proceeds from pull tickets in the province since 1996. In total, pull tickets generated \$133 million in charitable revenues over the period 1996 to 2008, a relatively small amount relative to other sources of charitable revenues. All dollar values are expressed in thousands of 2008 dollars. From 1996-2004, proceeds remained relatively stable. The proceeds decreased slowly from 2003 until 2007. In 2008, proceeds from pull tickets generated the highest amount in the entire sample at just under 15 million dollars, a significant increase from previous years.



Table 16.3: Charitable Revenue from Pull Tickets by Location (millions of 2008 Dollars)

Year	Revenue By Location			Total
	Calgary	Edmonton	Other	
1996	2.97	1.11	6.82	10.90
1997	3.41	1.37	6.69	11.47
1998	3.21	1.63	7.08	11.91
1999	2.52	1.23	6.61	10.37
2000	2.45	1.19	6.34	9.99
2001	3.37	1.49	6.53	11.39
2002	2.55	1.31	5.73	9.58
2003	2.85	1.74	6.26	10.84
2004	2.56	1.46	5.01	9.03
2005	2.16	0.85	4.68	7.69
2006	2.31	1.09	4.53	7.92
2007	2.22	0.60	4.85	7.67
2008	3.57	3.39	7.85	14.81

Figure 16.4 graphically shows the information on Table 16.3 to highlight the contributions to charitable pull ticket revenues from different parts of the province. Pull ticket revenues have been generated primarily outside of the major population centres until recently. Edmonton has consistently generated more in charitable pull ticket revenues than Calgary. The increase in charitable pull ticket revenue in 2008 coincides with an increase in the pull ticket sales throughout the province. Overall, the revenues have remained relatively stable as the number of licenses issued has decreased as Figure 16.3 illustrated. The reasons for the huge increase in charitable pull ticket revenues in 2008 are unclear.

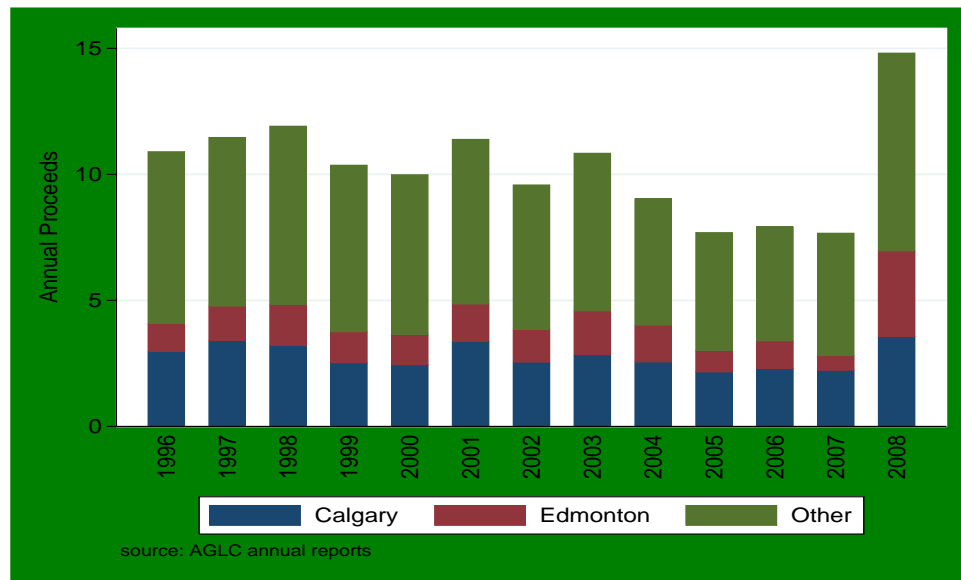
## 16.4 Profile of Instant Game Players

Table 16.4 presents the demographic profile of scratch off lottery players in Alberta, based on data from the 2008 and 2009 population surveys carried out as part of this research project.<sup>1</sup> This profile is based on survey data that has been weighted to adjust the sample to match the age-sex population of Alberta based on the 2006 Census.

The participation rate of instant game players in Alberta is the second-highest of the gambling sub-groups at 31.7% which is the second most popular in the survey. The average age matches the provincial mean of 42.3 years, and a slight majority at 53.7% are female.

<sup>1</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.

Figure 16.4: Total Proceeds from Pull Ticket Sales in Alberta



Instant game players are less inclined to be single (20%) than average (34%), showing a higher preference for legal marriage (54.4% vs. 51%) or common law arrangements (12.6% vs. 9%). Their divorce rate of 4.9% is below the provincial average of 8%.

Up to the level of high school education, instant game players exceed the provincial average by almost 15%. Fewer attend college, however. The combined percentage for trades or other training is 28.4% compared with 33.9%. More of them have university degrees, but the difference is very slight - at 22.5% they lead the provincial average by only half a percentage point.

It is difficult to ascertain whether these combined results represent a higher level of education, but if so the income levels do not reflect it. While more of them hold down full-time jobs (56.8% vs. 52%), instant game players earn less than the provincial average. The proportion earning less than \$40,000 is 48.1% while in the general population it is 33.5%. Only 31.8% earn between \$40,000 and \$80,000, whereas overall that percentage is 38.1%. Instant game players earning in excess of \$80,000 are also under-represented. That proportion is approximately 20%, compared to 36.7% of all Albertans. Almost 20 percent of a instant win lottery game participant's debt, comes from gambling.

Instant game players form one of only two groups where women outnumber men. The other is bingo. In aggregate, they match the average age in the province, and more of them live in married or common-law relationships that seem more stable than the provincial average. Although more of them achieve high school education, fewer go on to college and about the same amount attend university. From this it is difficult to find a marked difference in the overall education level of instant game players, but their income levels are certainly lower than the provincial average.

Table 16.4: Demographic Profile of Instant Game Players

<b>Demographics</b>		<b>Income</b>	
Participants in 2008	779,391	less than \$40,000	48.1%
Participants in 2009	866,957	\$40,000-\$80,000	31.8%
Average Age	42.3	\$80,000-\$120,000	11.7%
Male	46.3%	more than \$120,000	8.4%
Employed Full Time	56.8%		
Student	10.6%	<b>Total Amount of Debt</b>	
		No debt	18.0%
<b>Marital Status</b>		less than \$10,000	23.5%
Single	20.0%	\$10,000-\$100,000	29.5%
Common-law	12.6%	More than \$100,000	29.0%
Legally Married	54.4%	% Debt from Gambling	18.3
Separated	2.9%		
Divorced	4.9%	<b>Racial/Ethnic Origin</b>	
Widowed	4.5%	Western European	66.1%
		Eastern European	14.5%
<b>Education</b>		South Asian	1.0%
Less than High School	9.7%	East Asian	2.2%
Completed High School	38.7%	Aboriginal	5.7%
Trade Degree	11.8%	African	0.2%
College Degree	16.6%	Latin American	1.2%
University Degree	22.5%	Other	9.0%

In summary, the instant win games of scratch off lotto, pull tickets, and raffles have seen a inconsistent period. Currently, raffles and pull tickets are higher than they were than the beginning of the respective sample periods. These games form the second most popular game in the province, but the delivery and premises of each game affects the demographic profile that each of them attract. There have been questions regarding the integrity of scratch off tickets in other provinces. AGLC conducted a thorough investigation for this province and did not find anything suspicious. However, they have been proactive in this regard and have implemented safeguards at lottery ticket centres throughout the province.

## 16.5 Problem Gambling Incidence Rates

Problem gambling is an important component of any SEIG analysis. We anticipate that research by the University of Lethbridge research team will address problem gambling among instant win ticket gamblers in Alberta in considerable detail. However, we have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of

Lethbridge. Interested readers should consult the University of Lethbridge report when it is made available.

## Chapter 17

# Sports Betting

### 17.1 Description of Sports Betting in Alberta

In the population survey, we asked survey participants about betting on sporting events. The survey questions reads

*In the past 12 months, how often have you bet money on sporting events (this includes sports pools and Sport Select tickets)?*

Based on this question, we have information on participation in two basic types of sports betting. An official form of legal sports betting, Sport Select, which is available at Lottery Ticket Centres (LTC) throughout the province and an informal form of sports betting, “sports pools,” which can take many forms, including office pools and other group betting on sporting events. Sports Select is a legal sports betting game operated by the Western Canadian Lottery Corporation. Sport Select is a “parlay” sports betting game rather than a traditional sports bet that takes place in sports books in Las Vegas casinos. In Sport Select players must pick an outcome on a minimum of three games and a maximum of six games from a list of games that are available on each day. participants may pick just winning teams, teams who will win against the point spread, or over/under outcomes (total points, goals, or runs scored by both teams) on games. If a bettor is correct on all picks, then the Sport Select bet wins. Sport Select can be played at any LTC, and Sport Select forms can also be filled out online, printed, and taken to a LTC to place the bet.

“Sports pools” is a broad term that describes any informal betting that takes place amongst individuals on sporting events and not related to Sport Select. The two biggest examples of this type of betting are hockey pools and National Collegiate Athletic Association (NCAA) Men’s Basketball

Postseason Tournament pools. The rules of sports pool betting and the prize structure are typically agreed upon by the group of participants. Sports betting pools are generally formed by friends or a co-workers. However, these pools can also take place on the internet at web sites such as Yahoo where the commissioner of the pool can collect money wagered using a system such as Paypal and technically anybody in the world could participate.

## 17.2 Profile of Sports Bettors

Table 17.1 presents the demographic profile of sports bettors, including Sport Select bettors and people who participate in office pools in Alberta, based on data from the 2008 and 2009 population surveys carried out as part of this research project.<sup>1</sup> This profile is based on survey data that has been weighted to adjust the sample to match the age-sex population of Alberta based on the 2006 Census.

The participation rate in sports betting is small, 9%. This represents less than a quarter of a million Albertans. This gambling subgroup is dominated by males (80%) and characterized by youth (35.7 years compared with the provincial average of 42.3 years).

The proportion of unattached Sport Select players, at 32.3%, is comparable to the provincial average of 34%. Of those in committed relationships, more than average prefer common law arrangements (12.8% vs. 9%) to the more formal legal marriage (45.9% vs. 51%) which is less than the provincial norm. Fewer get separated (1.9% vs. 3%) or divorced (3.3% vs. 8%), and likely due to their relative youth, fewer are widowed.

The results offer an ambiguous comparison of education levels between Sport Select bettors and the overall provincial profile. More Sport Select players, at 37.7% hold only a high school diploma, compared to 24.1% among Albertans. However at 8.3%, fewer have less than high school (15.4% is the provincial average). On the other hand, of those Sport Select players moving on to post-secondary education more than the provincial average prefer university to college. They seem less interested in pursuing trades (7.7% vs. 12.4%) and other training at the college level (16.8% vs. 21.5%), and attend university in greater numbers (28.5% compared to 22%).

The results for the income levels of Sport Select bettors are less ambiguous. They earn less. More of them (41.6%) earn less than \$40,000 than average (33.5%). Fewer (33.7%) earn between \$40,000 and \$80,000 than is the provincial norm for that range (38.1%), and at 24.7% only two-thirds as many Sport Select players earn above \$80,000 as do Albertans in general.

The typical Sport Select player is a young male with either a high school diploma or a university degree. He earns less than the provincial average. Although he is as likely to be single as Albertans in general, common-law is the preferred arrangement for committed relationships, and the committed relationships appear to be more stable than that of the average Albertan resident.

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<sup>1</sup>Professor Robert Williams of the University of Lethbridge designed and supervised the collection of these data. We gratefully acknowledge and thank Professor Williams for this work.

Table 17.1: Demographic Profile of Sports Bettors

<b>Demographics</b>		<b>Income</b>	
Participants in 2008	233,145	less than \$40,000	41.6%
Participants in 2009	234,420	\$40,000-\$80,000	33.7%
Average Age	35.7	\$80,000-\$120,000	13.1%
Male	80.2%	more than \$120,000	11.6%
Employed Full Time	72.6%		
Student	19.2%	<b>Total Amount of Debt</b>	
		No debt	21.0%
<b>Marital Status</b>		less than \$10,000	21.6%
Single	32.3%	\$10,000-\$100,000	32.9%
Common-law	12.8%	More than \$100,000	24.9%
Legally Married	45.9%	% Debt from Gambling	16.8
Separated	1.9%		
Divorced	3.3%	<b>Racial/Ethnic Origin</b>	
Widowed	2.3%	Western European	61.5%
		Eastern European	12.0%
<b>Education</b>		South Asian	1.9%
Less than High School	8.3%	East Asian	6.2%
Completed High School	37.7%	Aboriginal	6.5%
Trade Degree	7.7%	African	%
College Degree	16.8%	Latin American	2.5%
University Degree	28.5%	Other	9.5%

### 17.3 Problem Gambling Incidence Rates

Problem gambling is an important component of any SEIG analysis. We anticipate that research by the University of Lethbridge research team will address problem gambling among sports bettors in Alberta in considerable detail. However, we have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult the University of Lethbridge report when it is made available.

## Chapter 18

# The Impact of Specific Types of Gambling

This chapter discusses conclusions that can be reached about the impact of specific types of gambling in Alberta based on the SEIGA framework developed by in this report. In examining the impact by game, we reported the historical and current supply of each game type in Alberta. We also examined the distribution of the charitable revenues and net sales when the type of data was available to us. We also used our population surveys from the past two years to create a demographic profile for the eight games that we specifically asked participants regarding their playing activity. Gambling activities are clearly heterogeneous. The spatial distribution of gambling activities is not uniform, the characteristics of the games differ, and the characteristics of the participants differ. This heterogeneity suggests that different conclusions can be drawn about the impacts of different types of gambling. We also treat First Nations casinos separately, because this type of gambling also has different characteristics than other types of legal gambling in the province.

### 18.1 Legal Forms of Gambling

The chapters on impacts by type contain demographic profiles of participants in each type of gambling, based on the population surveys carried out in 2008 and 2009. Table 18.1 shows all eight types of games covered in the surveys and a summary of selected demographic characteristics of participants in each game in the population survey.

From Table 18.1, traditional lottery is the most popular game played by Albertans with almost 60 percent participating in a ticket lottery game each year. It also has the oldest demographic with the average age of participants at 45.5 years old. Males comprise 52 percent of lotto players and



Table 18.1: Demographic Profile of Gamblers by Type of Gambling Activity

Gambling Type	Part. Rate	Age	Income	Male	% HS Grad	% Col. Grad	% Employed
Lottery	59.3%	45.5	\$63,709	52%	35%	45%	59%
Instant Win	31.7%	42.3	\$58,885	46%	39%	39%	57%
Slot Machines	16.1%	44.3	\$64,714	50%	40%	48%	58%
VLT	12.4%	44.4	\$62,194	57%	39%	33%	59%
Sports Betting	9.0%	35.7	\$64,274	80%	38%	54%	72%
Casino Table Game	8.7%	35.5	\$75,681	80%	35%	48%	77%
Bingo	5.1%	44.3	\$64,714	30%	41%	41%	40%
Horse Racing	4.5%	44.6	\$86,161	65%	29%	38%	69%

close to 60 percent of players are employed. Due to its high popularity and acceptance amongst the people of Alberta, lottery ticket centres have been evenly distributed within the province so as to allow people easy access to purchase traditional lottery tickets.

Instant win games are comprised of scratch off lottery tickets, pull tickets, and raffles. This is the second most popular type of game in the province with a participation rate of around 32 percent. The average age is three years younger than traditional lottery and more females play these games than males (54 percent female and 46 percent male) which is different than traditional lottery.

Slot machines are the third most popular game in the province. Slot machines are in casinos and at horse racing facilities throughout the province. 16.1 percent of Albertans play slot machines. The average age of a slot machine player is 44 years old and they earn about \$65,000. 48 percent of slot machine players have a college degree and exactly half of the players are male. Examining the evidence on financial distress and bankruptcy in Chapter 5, along with the results on self-reported happiness in Chapter 8, slot machine players appear to have a greater chance of borrowing money and higher financial distress compared to participants in all other games. In addition, slot machine players had lower self-reported stress but higher self-reported health problems due to gambling. These results could be related to the nature of slot machine play (easy to sit and feed money into them), plus the immediate feedback one receives from play slot machines. In addition, these two results could be related to the relatively low payout of slot machines compared to other game types.

VLTs have a participation rate of 12.4 percent. This is the only game delivered outside either a traditional gambling facility or lottery ticket centre. The location of VLTs are in bars and lounges. The average age of VLT players is 44 years old. Out of all the games surveyed, VLT players have the lowest income at 62,000. More males play VLTs than females and they have the lowest percentage of players with college degrees at 33 percent. VLTs are generally positioned in areas that do not have many gambling options such as casinos and race tracks. This results in many of the rural locations throughout the province having a higher VLT concentration per 1000

population than the bigger cities. There are many similarities between the demographic profile of slot players and VLT players. This makes sense due to commonalities in the games but differences in where the game takes place. Empirical analysis examining a consumer's decision to participate and frequency of his/her participation in Alberta shows that consumers of these two games have different characteristics. (Humphreys, Lee, & Soebbing, In press).

Sports betting examines office pools as well as the Sport Select game. Sport Select is the only legal and formal sports betting in Alberta. Nine percent of Albertans participate in some sort of betting on sports. They have the second youngest average age at 35.7. Eighty percent of people who bet on sports are males with 54 percent of all participants having a college degree. That is the highest percentage amongst all game surveyed. In addition, 72 percent of people who bet on sports are employed.

People playing casino table games such as blackjack, poker, and craps have a participation rate of 8.7 percent which is similar to the participation rate of people who bet on sports. The average age is the youngest of all the games at 35.5 years old. The average income of a person who plays table games at a casino is over \$75,000 which is the second highest average income amongst all games surveyed. Just like people who bet on sports, 80 percent of participants who play casino table games are male. Forty-eight percent of players have a college degree which is the second highest among all games and 77 percent of them are employed which is the highest rate among all the eight games in our population survey. These percentages are similar to people who participate in sports betting which is not surprising since both games are more "thinking" type games that require knowledge of the game and quantitative skills to assess probabilities and payouts. These skills are not needed as much in the other previously mentioned games such as slot machines and instant win tickets. With the growth of the World Series of Poker and other poker being available to watch on TV and play online, this demographic profile of casino table game players are not surprising.

Bingo has the second lowest participation rate of 5.1 percent. The average age and income is similar to the majority of games survey. Bingo has the lowest percentage of male players at 30 percent. It also has the lowest employment rate at 40 percent of participants reporting that they are employed. This may be an indication that many people in their retirement years are playing bingo. Bingo has been in a huge state of decline not only by the decrease in the number of facilities, but also in the participation of bingo which results in a lower amount going to charitable gaming.

Betting on horse racing has the lowest participation rate in the province. This is not surprising because a bit of knowledge and skill is required to bet on horses compared to playing the lottery or slot machines. As a result, the horse racing industry is in a state of decline as it faces challenges from both other gambling options and entertainment options. In the last two decades, the industry attempts to reverse the decline of interest in horse racing by having simulcast betting and slot

machines at the racetracks. We explored these two changes within Chapter 14. Gamblers at racetracks are likely to be older males and married. They are likely to be employed and make the highest average income among all the games surveyed at just over 86,000 per year. Horse racing players also have the highest percentage of reported debt from gambling amongst all games in our population survey.

There are also important differences in the gender and level of education of participants. Sports betting, slot machines, and casino table games attract the most educated participants while VLTs, instant win games and horse race betting attracts a relatively less educated participant. Sports betting and casino table games are primarily played by men while bingo is primarily played by women. In terms of employment and average income, we find that horse race bettors and lottery and income players are likely to have a lower average income and a greater percentage is not be employed full time compared to the other type of games examined. This correlation between relatively low average income and low full-time employment is due to the fact that most participants in these games are retirees.

### 18.1.1 Implications

The implications from the impact of gambling type falls into two groups. First, from Table 18.1, each game attracts a different type of participant. There are some similarities in the profiles of participants, but for the most part, each game attracts a different type of participant which is important when considering both the positive and negative impacts that gambling has in the province. For example, instant win games are played by people with relatively low incomes and relatively less higher education, while casino table games are played by relatively high income males with relatively more education. An expansion of opportunities to play instant games will have a different impact on society than an expansion of opportunities to participate in casino table games, because the profile of the average participant differs in several ways.

The heterogeneity of participants in different games also highlights the importance of treating each game differently rather than focusing attention on one particular game, because focusing on only one element of the gambling “portfolio” in the province one does not reflect the overall impact of the “portfolio” because of differences in the participants.

The second relates to the distributive aspect of the games. Policy makers have done a good job distributing gambling opportunities across the province. As a result, we observe growth in the proceeds from these games that go to charitable gaming and the Alberta Lottery Fund. There appear to be opportunities to open additional gambling facilities in other areas around the province but policy makers need to use caution and not saturate the overall gambling market, or the market for any single game.

The implications will depend on the problem gambling incidence rates for each type undertaken by the Lethbridge research team. We have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult this report when it is made available.

## **18.2 First Nations Casinos**

### **18.2.1 Conclusions and Implications**

We anticipate that the volume submitted by the University of Lethbridge research team will address the impact of First Nations Casinos in detail. However, we have not been given access to the results and conclusions about First nations gambling contained in the final report by the University of Lethbridge. Interested readers should consult the Lethbridge report when it is made available.

## Part IV

# Impacts by Geographical Area

## Chapter 19

# The Spatial Distribution of Gambling in Alberta

This chapter summarizes previously discussed socioeconomic impacts of gambling in Alberta by geography. Alberta contains two major census metropolitan areas, Calgary and Edmonton. The residents of these two census metropolitan areas constitute two-thirds of the provincial population. In previous chapters, we examined socioeconomic impact by domain and type of game. In analyzing the socioeconomic impact in those chapters, we often observed interesting patterns in impacts across geographic areas in the province, either by census division, specific communities, or by type of community (for example rural and urban).

The secondary data analyzed in this report contain significant geographical detail. The Canadian Business Patterns survey data analyzed in Chapter 7 contains detailed information about establishment counts and employment at the census division level. The crime data analyzed in Chapter 9 from the Uniform Crime Reports contains detailed information about crimes at the same level. This is helpful, because establishments in the gambling industry in Alberta are not uniformly distributed across the province. The Labour Force Survey contains information about individual participants in the labour force at the sub-provincial level. Much of the data provided by the AGLC also contains information about activities at the sub-provincial level. For example, charitable gaming pay outs are disaggregated to the level of major centres, and a considerable amount of data on revenues of specific types of gambling are available at the sub-provincial level. Data from AGLC reports provide detailed information on, for example, charitable gaming payout by specific major centres and individual cities in the province. Data on grant distribution from the Alberta Lottery Fund can be disaggregated by census division.

The socioeconomic impact of gambling is not uniformly distributed across the province. Socioeconomic impact depends on the distribution of population and economic activity across the

province, and these factors are not uniformly distributed. An analysis of the spatial dimension of socioeconomic impact reveals interesting patterns, and helps shed light on regional differences in the socioeconomic impact of gambling in the province.

## 19.1 Geographic Regions in Alberta

Statistics Canada defines the official geographic units in Canada. The top level geographic divisions are provinces and territories. Below the level of province and territory are sub-provincial geographic areas: economic regions, census divisions, census subdivisions and census dissemination areas. Statistics Canada also defines Census Metropolitan Areas (CMAs), but CMAs do not include all residents of Canada, they only contain urban areas. In this chapter, we make use of data at a variety of levels of geographic dis-aggregation, depending on source and availability.

### Census Divisions

A census division is the largest standard sub-provincial geographic area defined in Canada. Statistics Canada defines a census division as a “[G]roup of neighbouring municipalities joined together for the purposes of regional planning and managing common services (such as police or ambulance services).”<sup>1</sup> Census divisions correspond to counties, regional municipalities or a regional districts in Canadian provinces. Alberta contains 19 census divisions.

Census divisions in Alberta are identified by number. Table 19.1 lists the number and corresponding principal city in each census division in the province, along with the area of each.<sup>2</sup> Note that the census division contains a considerably larger area than this principal city. We list the principal city in each census division to provide a rough guide to the location of each census division. While there is considerable variation in the size census divisions, the most salient feature is that most of the population is in census division 2 (Lethbridge), 6 (Calgary), 8 (Red Deer), and 11 (Edmonton). Most economic activity takes place where the population is largest.

Figure 19.1 shows the 19 census division in Alberta along with the major municipalities and counties included in each census division. Figure 19.1 also shows the population of each census division graphically. The darker the color of the census division, the larger the population.

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<sup>1</sup>[http://geodepot.statcan.ca/2006/180506051805140305/03150707/19081518200405190318091620091514\\_05-eng.jsp?GEO\\_LEVEL=3&ABBRV=null&REFCODE=10&LANG=E&TYPE=L](http://geodepot.statcan.ca/2006/180506051805140305/03150707/19081518200405190318091620091514_05-eng.jsp?GEO_LEVEL=3&ABBRV=null&REFCODE=10&LANG=E&TYPE=L)

<sup>2</sup>Information taken from Alberta First website (URL: <http://www.albertafirst.com/profiles/cd/>)

Table 19.1: Census Division Characteristics and Principal Cities

#	Principal City in Census Division	Area (km <sup>2</sup> )	2007 Population
1	Medicine Hat	20,526	74,550
2	Lethbridge	17,660	142,429
3	Fort MacLeod	13,866	37,846
4	Hanna	21,467	10,600
5	Drumheller	16,755	51,104
6	Calgary	12,645	1,160,936
7	Stettler	19,201	39,909
8	Red Deer	9,909	175,337
9	Rocky Mountain House	18,921	20,351
10	Camrose-Lloydminster	20,452	89,796
11	Edmonton	15,745	1,076,013
12	St. Paul	30,047	59,990
13	Athabasca	24,373	66,972
14	Edson	26,964	27,881
15	Banff	28,400	34,150
16	Fort McMurray	97,267	53,080
17	Slave Lake	192,084	59,282
18	Grande Cache	33,205	14,322
19	Grande Prairie	20,518	98,712

### 19.1.1 Economic Regions

An economic region is composed of one or more census divisions in a province. Alberta contains eight economic regions. The Lethbridge-Medicine Hat economic region contains census divisions 1, 2, and 3. The Camrose-Drumheller economic region contains census divisions 4, 5, 7 and 10. The Calgary economic region contains only census division 6. The Banff-Jasper-Rocky Mountain House economic region contains census divisions 9, 14 and 15. The Red Deer economic region contains only census division 8. The Edmonton economic region contains only census division 11. The Athabasca-Grande Prairie-Peace River economic region contains census divisions 13, 17, 18 and 19. The Wood Buffalo-Cold Lake economic region contains census divisions 12 and 16.

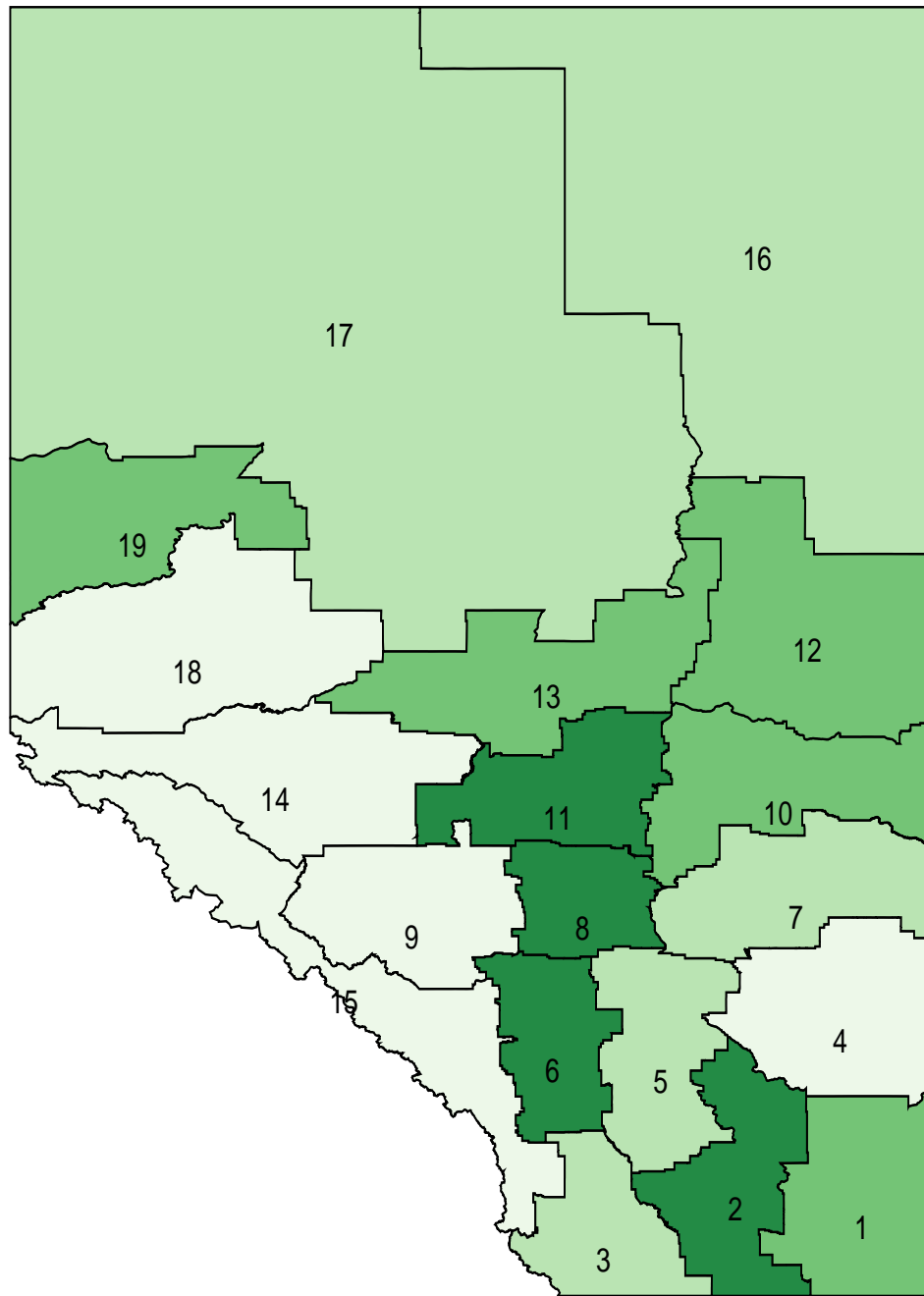
## 19.2 The Spatial Distribution of Gambling Activity in Alberta

### 19.2.1 The Spatial Distribution of VLT Activity in Alberta

VLTs are both popular and controversial forms of gambling in Alberta. Since their introduction in the early 1990s, the popularity of VLTs among gamblers has grown, as has the debate about



Figure 19.1: Alberta Census Divisions and Population



*Darker colors indicate larger population*

their place in the province. Chapter 12 on page 203 describes the current state of VLT gambling in Alberta. Section 12.2 on page 204 discusses the availability of VLTs in the province. Section 12.6 on page 210 describes the characteristics of VLT players in the province. Here, we examine the spatial distribution of VLTs, and economic activity associated with VLTs, in the province. The topic is of interest because VLTs are controversial, and a number of communities have held plebiscites on the

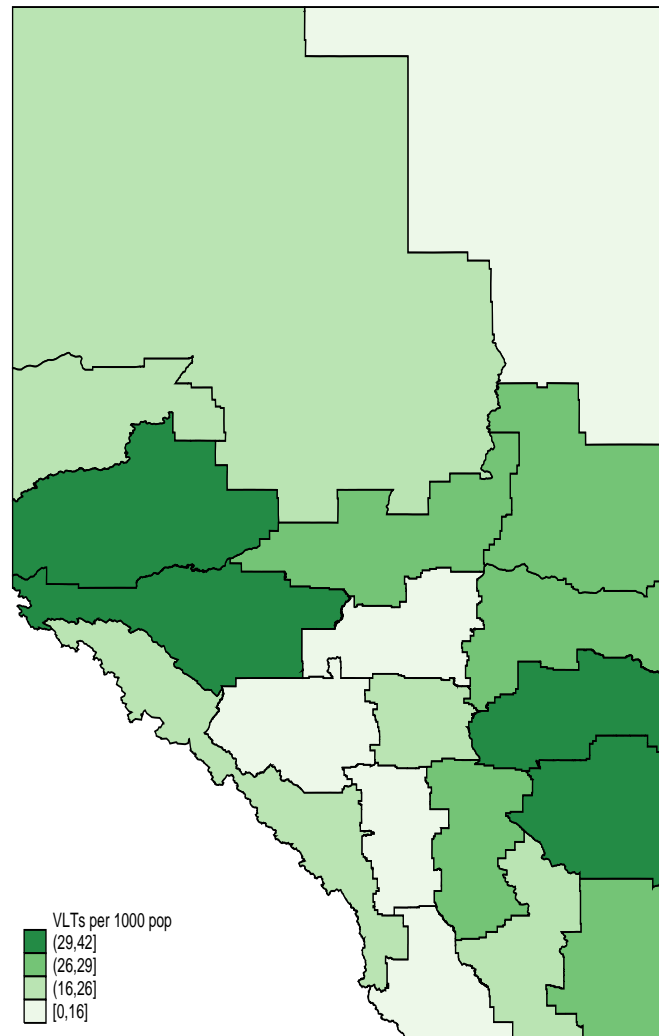
presence of VLTs in the past. Some communities voted to remove them; other communities voted to keep them, and many communities never held a plebiscite on VLTs. Since different communities appear to have different opinions about VLTs, the spatial distribution of VLTs in the province deserves attention. In addition, VLTs generate significant revenues for the Alberta Lottery Fund (see Section 10.2 on page 178), so the spatial distribution of VLTs across the province reveals the primary source of these charitable funds that are redistributed across the province in the form of grants.

Figure 19.2 shows the number of VLTs per 1000 population in each census division in Alberta. VLTs per 1000 population is a basic measure of access to VLTs in the census division, although the large disparities in size and population of census division across Alberta tends to distort this somewhat. The more VLTs per 1000 population in a Census District, the easier the access to VLTs for residents of that Census District. On this graph, darker green colors mean more VLTs per capita in that census division and lighter green colors mean fewer VLTs per capita.

Note from Figure 19.2 that, in per capita terms, VLTs are not that common in the densely populated census divisions in the centre of the province containing Edmonton, Calgary, Red Deer and Lethbridge. Those census divisions have the lightest shading on Figure 19.2. Part of this difference can be attributed to the huge differences in population across census divisions in the province. From Table 19.1 census divisions 4 and 18 contain less than 15,000 people, so even a small number of VLTs in those areas increases the number per capita significantly in these areas. Still, the densely populated census divisions containing Edmonton, Calgary, Red Deer and Lethbridge are all shaded lightly in Figure 19.2, indicating relatively few VLTs per capita in these census divisions. One reason for the relatively small number of VLTs per capita in densely populated areas like Edmonton and Calgary is the presence of other entertainment activities in those areas. In per capita terms, VLTs are much more common in those census divisions in dark green on Figure 19.2. These census divisions are census division 18, (the upper census division on the western boarder, containing Grand Cache), census division 14 (the lower one on the western boarder, containing Edson), census division 7 (the upper one on the eastern boarder, containing Stetler), and census division 4 (the lower one on the eastern boarder, containing Hanna). Despite their relatively small populations, these four census divisions have the largest number of VLTs per capita in the province. The presence of VLTs does not necessarily reflect the amount of revenues earned by each machine, because VLTs in relatively populated areas may be played more than those in less populated areas. Below we examine VLT revenues per capita across census divisions.

Figure 19.3 shows times series plots of the number of VLTs per capita in census divisions over the period 1994 to 2008. These time series plots reveal changes in access to VLTs in census divisions over time. Figure 19.3 contains several interesting features. The number of VLTs in the province has been fixed at 6,000 since they were introduced in 1994. Since the graphs on Figure 19.3 are in per capita terms, observed changes on this graph reflect movement of VLTs between census

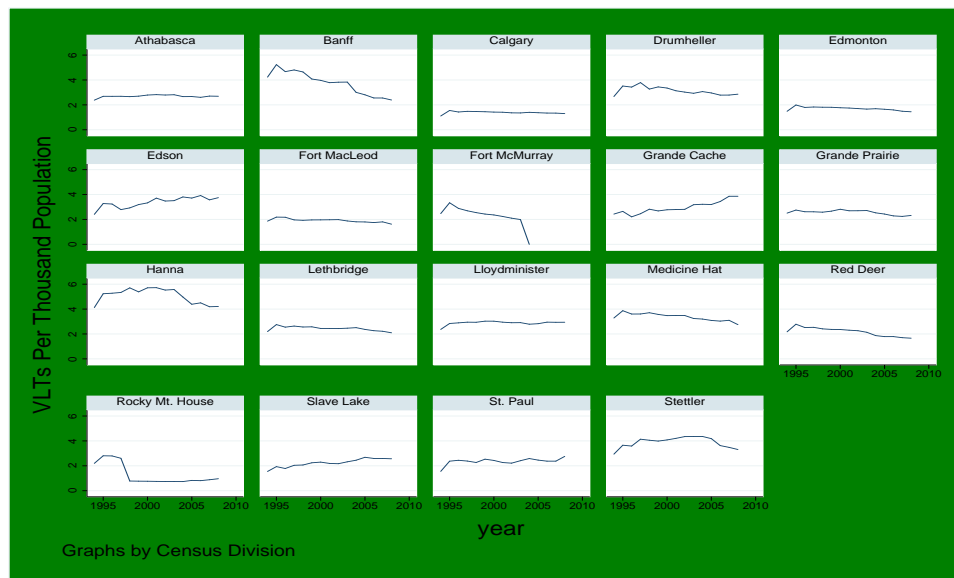
Figure 19.2: VLTs Per 1000 persons, Census Divisions



divisions. The trends on Figure 19.3 show significant variation in the number of VLTs per capita within several census divisions over time. Some of these changes are due to outcome of plebiscites in communities that decided to ban VLTs after their introduction. The Alberta gambling time line in Appendix A on page 302 contains details about these plebiscites and their outcomes. The easiest change in the number of VLTs per capita within a census division to see on Figure 19.3 is in the census division containing Fort McMurray, where VLTs were banned in 2004. The time series plot there clearly drops off rapidly after 2004. Figure 19.3 also reveals downward trends in other census divisions (Banff, Drumheller, Edmonton, Grand Prairie, Hanna, Lethbridge, Medicine Hat, Red Deer and Stetler) and upward trends in others (Edson, Grand Cache, Slave Lake, St. Paul). Again, these changes reflect decisions by AGLC to move VLT licenses within the province.

The number of VLTs per thousand population reflects opportunities to play VLT machines in

Figure 19.3: VLTs Per 1000 Population, 1994-2008

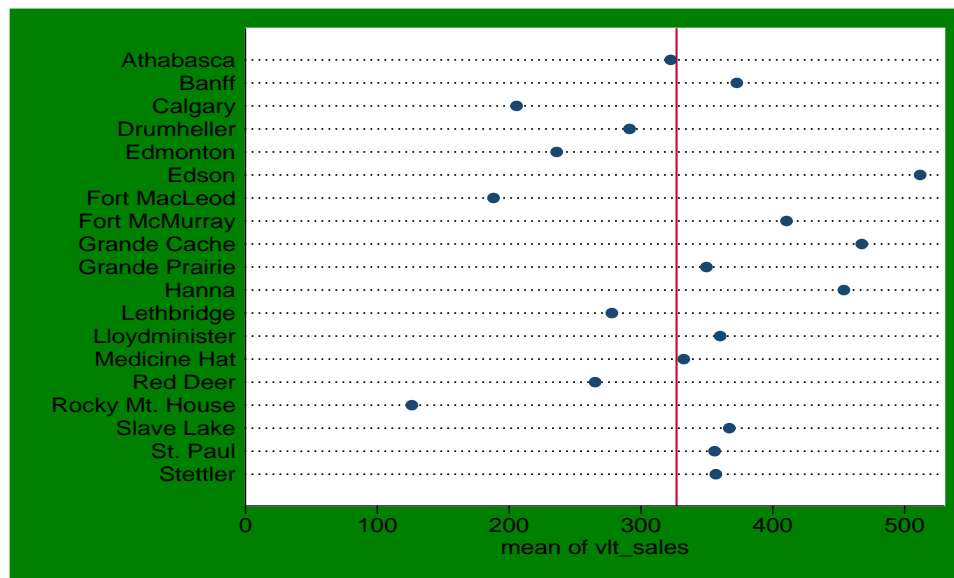


that area, but not necessarily the amount of VLT play that takes place. Figure 19.4 shows the average net VLT sales, defined as coin in minus coin out, per capita in Alberta's 19 census divisions in real 2008 dollars. Net VLT sales per capita can be interpreted as a measure of the intensity of economic activity associated with VLTs. The higher the average net sales of VLTs in a census division, the more those VLTs are played. Note that this figure is expressed in dollars spent per 1000 persons in the census division, implying that net VLT sales per person is quite small in the province, less than a dollar per person per year. However, from Chapter 12, the VLT participation rate is 12%, so net VLT sales per capita considerably understates net VLT sales per participant. Also, keep in mind that the city listed on each panel in Figure 19.3 is just the main city in each census division, and that census divisions are larger areas than these cities. Most census divisions in Alberta contain one or more counties.

On Figure 19.4, each point represents the average level of real net annual VLT sales per 1000 persons in that census division. The scale is horizontal, so the farther to the right the point is on the graph, the larger the average level of real net annual VLT sales per 1000 persons in that census division. The red vertical line is drawn at the provincial average of \$327 in net VLT sales per person. Dots to the left of this line indicate census divisions with below average net VLT sales per person and dots to the right of the line indicate census divisions with above average net VLT sales per person.

Notice the relatively large spread of average net VLT sales across census divisions on Figure 19.4. The three largest average values on Figure 19.4, census division 18, (the census division containing Grand Cache), Census District 14 (the census division containing Edson), and census

Figure 19.4: Average Net VLTs Sales per 1000 Population by Census Division, 1994-2008



division 4 (the census division containing Hanna), also had among the largest number of VLTs per capita in the province. Census divisions with a large number of VLTs per capita also have high net VLT sales per capita. It appears that VLTs have moved to where the most interest in playing VLTs exists since their introduction in the province in 1994. Of course the census division containing Fort McMurray has the lowest net VLT sales per person, given the absence of VLTs there since 2004. Also note that the four largest census divisions in terms of population, Calgary, Edmonton, Lethbridge and Red Deer, are all below average in terms of net VLT sales per 1000 population.

One possible explanation for this is that VLT play has an important entertainment component. People like to play VLTs because it is entertaining. In densely populated urban areas like Calgary and Edmonton, people face a rich array of entertainment options, like movie theatres, plays, sporting events, etc., reducing the relative entertainment value of VLTs. In less populated rural areas, entertainment options are fewer, and the relative entertainment value of VLTs is larger, leading to more average net VLT sales per capita. The fact that VLTs are in bars and taverns in Alberta makes them a potentially attractive entertainment option in many rural communities.

Figure 19.5 shows time series plots of real net VLT sales per 1000 people over the period 1994 to 2008 for Alberta's 19 census division. This graph indicates within census division changes in the intensity of VLT play over time. The key features of interest on this figure are the trends over time in the census divisions. In general, the time series plots are relatively smooth over the period, suggesting little year-to-year variation in VLT play per capita. No changes at the business cycle frequency appear, suggesting that the overall economic climate in the province has little impact on net VLT sales.

Figure 19.5: Net VLTs Sales Per 1000 Population, 1994-2008

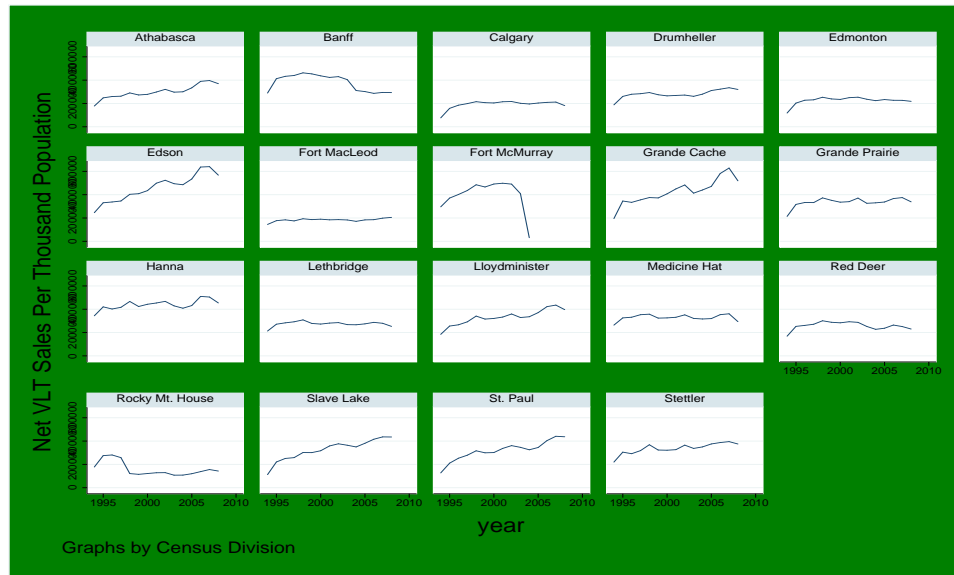
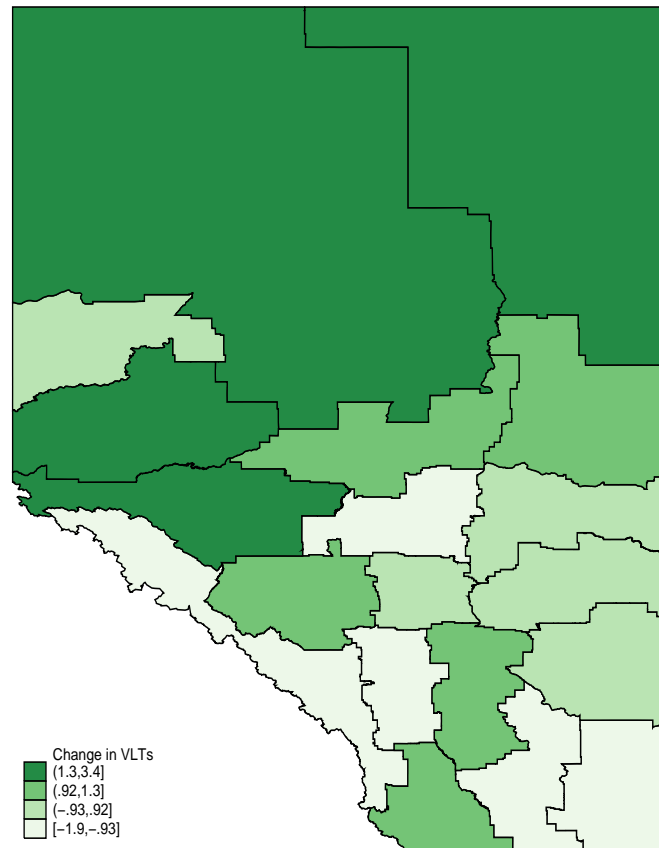


Figure 19.5 reveals upward trends in the census divisions containing Athabasca, Drumheller, Edson, Grande Cache, Lloydminster, Slave Lake, St. Paul and Stettler. Real net VLT sales per capita in these census divisions grew over the period in inflation adjusted terms, suggesting increased interest in VLT play. The trend is either downward or flat in the relatively populous census divisions containing Calgary, Edmonton, Lethbridge and Red Deer. Again, these patterns in trends are consistent with the idea that VLTs have an important entertainment component. In populous areas with many entertainment options, people tire of VLTs over time and switch to other activities, leading to downward trends in net VLT sales per capita in urban areas. In less populous areas, VLTs are an important source of entertainment and the average net sales per person trend up over time.

Figure 19.6 shows the average change in real net VLT sales over the period 1994 to 2008 expressed as growth rates. This figure is related to the information presented on Figure 19.5. The census divisions with the steepest upward trends on Figure 19.5 will appear darker on Figure 19.6 and those with flat or downward trends will appear lighter. From Figure 19.6, the north-south difference in growth rates of real net VLT sales per capita is striking, a feature not easily detectable on Figure 19.5. Net VLT sales grew fastest in the northern part of the province; all of the census divisions in the northern part of the province are dark green, with the exception of Census District 19, that contains Grande Prairie. Grande Prairie is relatively small in population and contains a casino, the Great Northern Casino, which opened in 1999. The presence of this casino might have led to “cannibalization” of VLT revenues in that census division. Interestingly, the census divisions with the highest growth rate of real net VLT sales per capita in the northern part of the province have relatively low numbers of VLT’s per capita, based on Figure 19.3. Play at individual VLTs

in these northern census divisions must have increased rapidly since the introduction of VLTs in 1994. This pattern suggests that more VLTs could be placed in these northern census divisions, based on the observed increase in real net VLT sales per capita.

Figure 19.6: Growth in Net VLT sales Per 1000 population, 1994-2008



Again, the pattern of growth rates of real net VLT sales is consistent with VLTs having an important entertainment component. The northern census divisions in Alberta are relatively less populated than the southern census divisions, and fewer entertainment options exist in these large, sparsely populated census divisions. In these census divisions, VLTs could represent an important source of entertainment, given the lack of alternatives.

In summary, the spatial distribution of VLTs, and the intensity of play of VLTs, as measured by net VLT sales per capita, varies considerably across the census divisions in the province. VLTs are less common, and played relatively less, in the populous census divisions containing Edmonton, Calgary, Lethbridge and Red Deer. VLTs are more common in less populous, rural census divisions in the province. Quite a bit of variation in both the number of VLTs per capita and real net VLT sales per capita took place in the province over the last fifteen years. Some of this variation can be

attributed to the outcomes of plebiscites on VLTs that took place over the past 15 years. Some of this variation can also be explained by changes in the location of VLT licences made by AGLC.

The patterns in the spatial distribution of VLTs, and VLT play, in the province are consistent with the idea that VLTs have an important entertainment component. In densely populated urban areas, many entertainment options exist, and VLTs are played relatively less. In addition, most casinos are located in densely populated areas, and if casino gambling is a substitute for VLT gambling, then the presence of casinos may also explain some of the observed spatial variation in VLT play across the province. For example, the relatively small growth rate of real net VLT sales per capita in census division 19 when compared to other northern census divisions may be attributable to the presence of a casino in Grande Prairie since 1999. The idea that VLTs provide entertainment value to residents of rural areas in the province should be kept in mind by regulators when they change the location of VLT licenses in the province.

### 19.2.2 The Spatial Distribution of Lottery Activity in Alberta

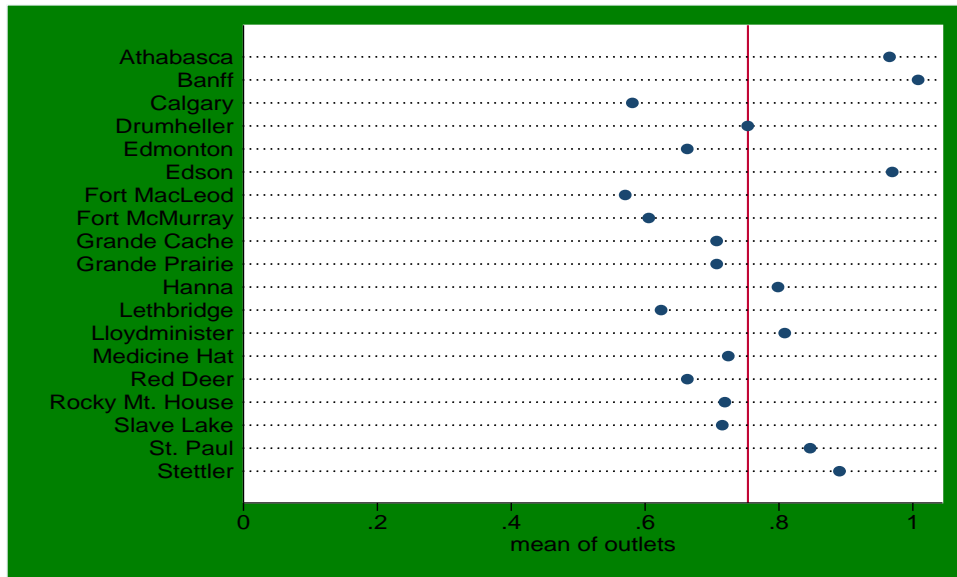
Lottery is by far the most popular form of gambling in Alberta. From Table 13.3 in Chapter 13 on page 215, the annual participation rate in lotteries in Alberta was nearly 60%. A majority of Albertans buy lottery tickets at least occasionally. According to estimates reported on Table 13.3 on page 222, more than 1.5 million Albertans purchased at least one lottery ticket in both 2008 and 2009. Unlike VLTs, discussed in the previous section, the purchase of lottery tickets does not have much immediate entertainment value (except of course for scratch off lottery tickets, which are not examined here). Clearly, an activity as popular as the purchase of lottery tickets is worthy of analyzing in detail. Here we discuss the spatial distribution of lottery activity in Alberta.

Lottery tickets are sold in Lottery Ticket Centres (LTCs) in Alberta. LTCs are generally located in retail establishments in the province. Figure 19.7 shows the average number of LTCs in each census division. The number of LTCs per capita can be interpreted as a general indicator of access to establishments selling lottery tickets in each census division. LTCs are evenly distributed across the province, as would be expected for such a popular form of gambling. In order for more than 1.5 million Albertans to purchase a lottery ticket each year, LTCs must be distributed relatively evenly across the province in convenient locations.

Figure 19.7 shows the average number of LTCs per 1000 population in each census division. On Figure 19.7, each dot represents the average number of LTCs per 1000 persons in the census division. The scale is horizontal, so the farther to the right on the graph is the dot, the larger the average number of LTCs per 1000 population in that census division. The red vertical line is drawn at the provincial average of 0.75 LTCs per 1000 persons. Dots to the left of this line identify census division with a below average number of LTCs per person and dots to the right of



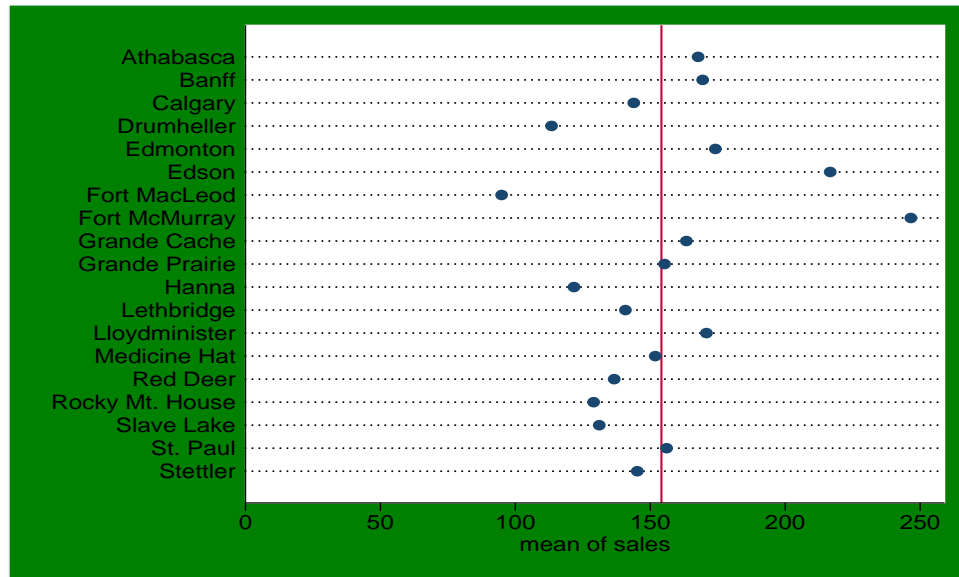
Figure 19.7: Mean LTCs per 1000 Population



the line identify census divisions with an above average number of LTCs per person. LTCs per 1000 population tends to be relatively low in census divisions containing cities like Edmonton, Calgary, Lethbridge and Red Deer that have large populations. LTCs per capita are somewhat higher in the less populous census divisions, particularly in the census divisions containing Athabasca, Banff, Edson, Hanna and Stettler. Still, the variation in LTCs per capita across the province, as shown by the spread of dots on Figure 19.7 is not as large as, for example, the variation in VLTs per capita in across census divisions shown on Figure 19.3 on page 263. LTCs are relatively uniformly distributed across the province.

Access to establishments selling lottery tickets may not reflect interest in buying lottery tickets. Figure 19.8 shows the average real value of lottery ticket sales per 1000 people in Census Divisions over the period 1994-2008. Again, the scale is horizontal on this figure, so the farther to the right on the graph, the larger the average value of lottery ticket sales per 1000 population in that census division. The red vertical line is drawn at the provincial average of \$154 in annual average lottery ticket sales per 1000 persons in the census division. Dots to the left of this line identify census divisions with below average annual lottery ticket sales per person and dots to the right of the line identify census divisions with average annual lottery ticket sales per person. Average Real sales per person is an indicator of demand for lottery tickets. Several interesting features are evident on Figure 19.4. The average net sales vary quite a bit, ranging from just \$95 in census division 3 (containing Fort MacLeod) to \$247 in census division 16 (the census division containing Fort McMurray). The census division containing Edson also stands out as one with relatively high average annual lottery ticket sales. Most of the dots on Figure 19.8 lie close to the average in the province, suggesting that lottery ticket sales per person do not vary widely across census divisions

Figure 19.8: Mean Lottery Ticket Sales per 1000 Population



in the province.

Figure 19.9: Mean Lottery Ticket Sales per 1000 Population, 1994-2008

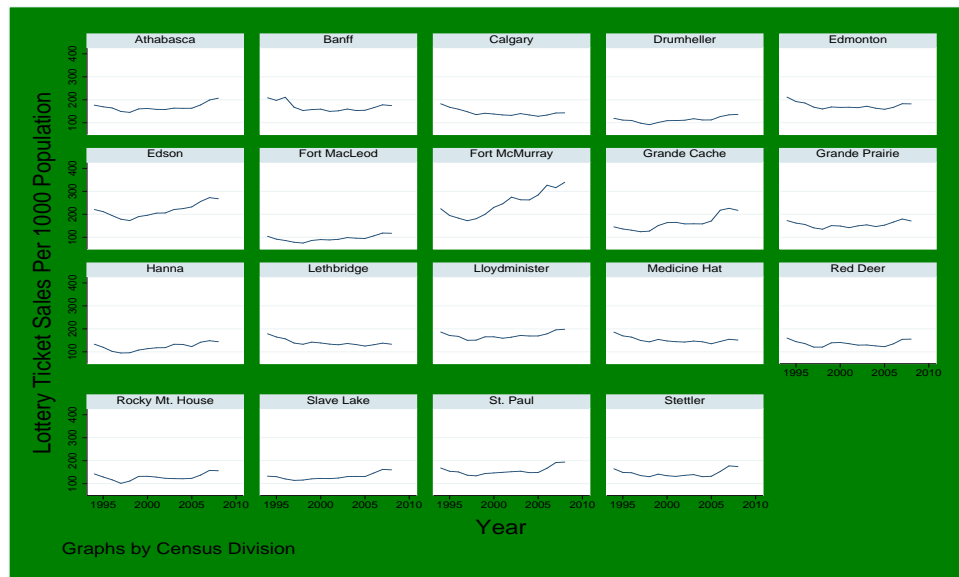


Figure 19.9 shows time series plots of real lottery ticket sales per 1000 people over the period 1994 to 2008 for Alberta's 19 census divisions. This graph indicates within census division changes in the intensity of lottery ticket purchase over time. The key features of interest on this figure are the trends over time in the each census division. In general, the time series plots are relatively

smooth over the period, suggesting little year-to-year variation in lottery ticket sales per capita. No changes at the business cycle frequency appear, suggesting that the overall economic climate in the province has little impact on lottery ticket sales.

Lottery ticket sales per capita increased markedly in several census divisions over this period. Notable positive trends exist in the census division containing Athabasca, the census division containing Edson, the census division containing Grand Cache, and the census division containing Fort McMurray. Fort McMurray is interesting to see the increase in the sales during this time because they banned VLTs during this sample period (refer to Figure 19.5). This could signal a shift in consumer spending as VLTs are banned. With lottery being one of the only gambling options in the area, it would come as no surprise that people who played VLTs switched to playing the lottery.

On the other hand, lottery ticket sales per capita decreased in the census division containing Calgary and the census division containing Medicine Hat. Lottery ticket sales per capita stayed relatively constant in the census division containing Edmonton over the period. These increases and decreases in lottery ticket sales per capita may reflect underlying changes in demand for lottery tickets in the census divisions. If, for example, demand for lottery tickets in a census division like the one containing Grand Cache grows over time, it could indicate that residents of this census division have an increased demand for lotteries, suggesting that more LTCs or games might be welcome by residence who like to play lottery in that area.

Overall, the trends on Figure 19.5 does not reveal much change in lottery ticket sales in the province, in inflation adjusted terms, but with a few notable exceptions. Most of the plots are relatively flat, suggesting little change in the average annual net sales in the census divisions. Most of the census division show little in the way of trends, with a few notable exceptions. The Census Division containing Fort McMurray exhibits a clear upward trend which could signal a shift in consumer spending from VLTs to lotto once VLTs were banned in the jurisdiction. Real net lottery ticket sales per 1000 people in that census divisions increased in inflation adjusted terms over the period 1994 to 2008. Since the figures are expressed in per capita terms, population growth cannot explain these upward trends in real net lottery ticket sales. The upward trends must be due to factors that affect spending per person. Such factors would include changes in income per person, if lottery tickets demand rises with income, or perhaps changes in the gender composition of the local population, if, for example, members of a particular demographic group are more likely to buy lottery tickets and that demographic group grows in the census division over time.

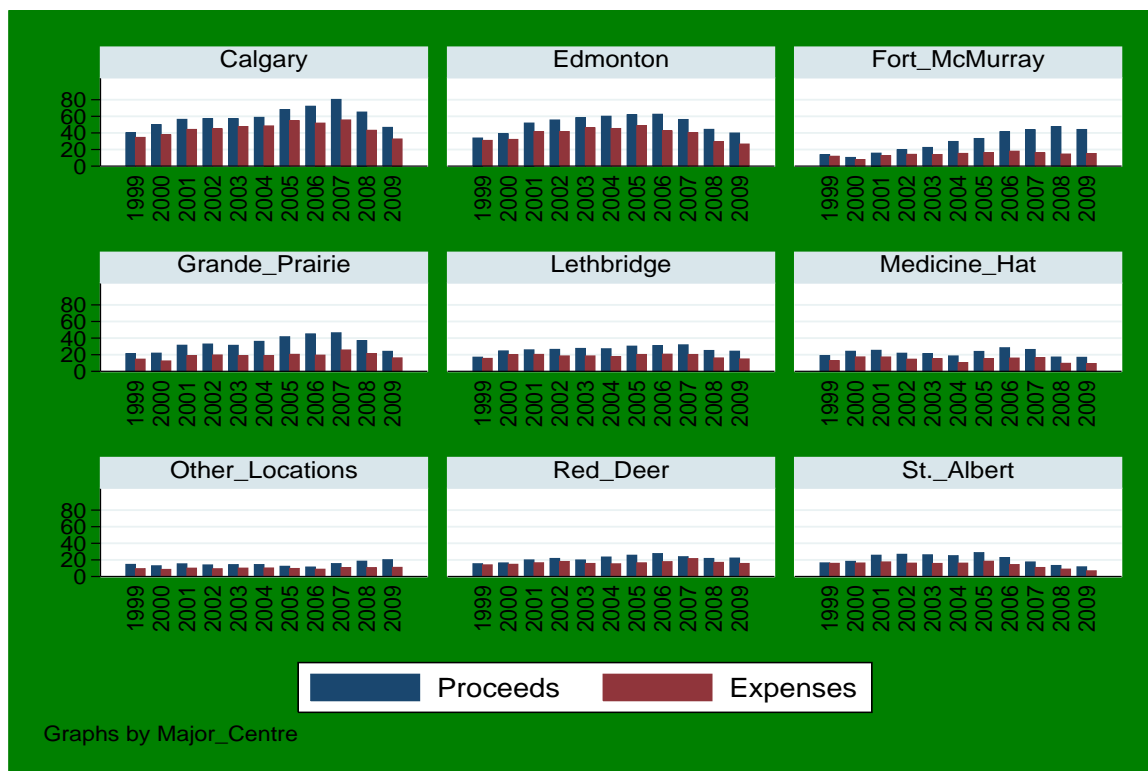
## **19.3 The Spatial Distribution of Charitable Proceeds in Alberta**

### **19.3.1 Charitable Gaming Proceeds by Major Centre**

Chapter 10, beginning with section 10.1 on page 174, discusses charitable gaming proceeds in the province in detail. In this section, we examine some interesting features of the spatial distribution

of charitable gaming proceeds across Alberta, as well as changes in the sources of charitable gaming proceeds in different parts of the province.

Figure 19.10: Mean of Charitable Gaming Proceeds and Expenses per License (millions)



Alberta's charitable gaming model takes the net revenues from gambling - the total amount gambled less prizes won - and after allowing for legitimate expenses for hosting and managing the charitable event, distributes the balance as proceeds to charitable organizations. Since each charity has to apply for and acquire a license to hold an event, the average proceeds per license can be taken as a measure of how efficient the available charitable gaming resources are at generating revenue. It is clear that the major population centres of Calgary and Edmonton, respectively, enjoy the most revenue per license. The magnitude of expenses relative to proceeds indicates the proportion of the net revenues from gambling available to the charity, and is easily seen by observing the differences in the heights of the bars for each year. It seems in general that proceeds from charitable gaming have declined over the last year or several years. Expenses have not seen as much of a proportional decline as proceeds, however. In the case of Fort McMurray, the ratio of expenses to proceeds is the lowest in the province.

Figure 19.10 shows the total value of revenues generated in Calgary, Edmonton, and all other areas of the province, as well as the proceeds from First Nations casinos over the period 1996 - 2008. Total proceeds grew slowly in inflation adjusted terms over the period, but the addition of

charitable proceeds from the newly opened First Nations casinos led to a significant increase in the past few years. Calgary and Edmonton contain most of the population in the province, and these two cities clearly generate the most charitable gaming proceeds.

### 19.3.2 Individual Cities

From the AGLC Annual Report data, we can undertake a detailed analysis of the dollars of charitable proceeds generated by specific game types in each year in Edmonton, Calgary, and a residual category for all other cities in the province. The province is not a homogenous region. Considerable heterogeneity exists across cities and other geographic areas in the province. The main cities are relatively far apart and have different characteristics in terms of demographics and businesses present in the area. A large fraction of the population in the province lives in these two cities. Also, Edmonton and Calgary have different mixes of types of gaming establishments and different characteristics in terms of demographic and economic factors. Examining charitable proceeds at this level can provide insight into the nature of charitable gaming proceeds. In addition, the long-standing and heated rivalry between these two cities makes a comparison of the charitable gaming proceeds generated in each of some interest.

#### Charitable Gaming Proceeds in Edmonton

Figure 19.11: Total Charitable Gaming Proceeds in Edmonton (millions)

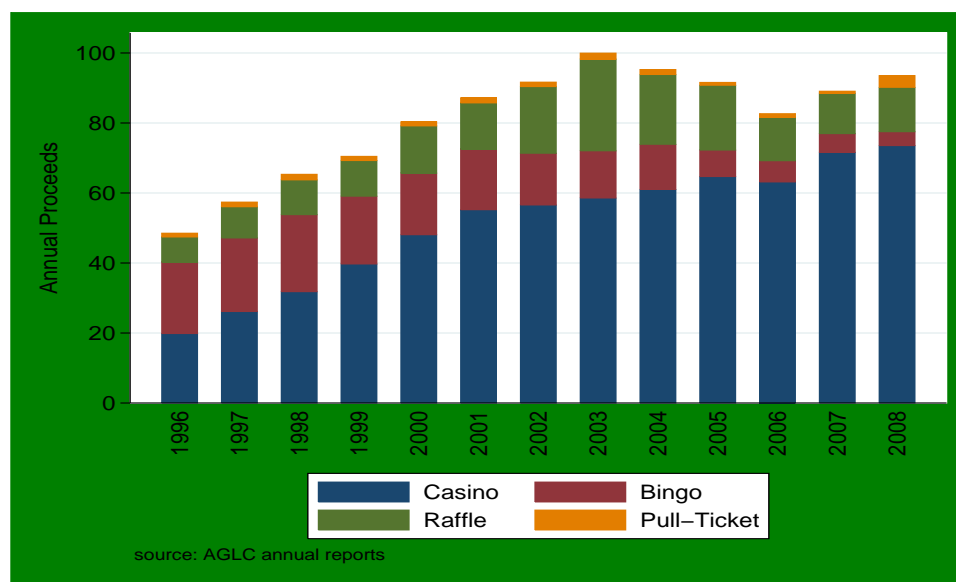


Figure 19.11 shows the total charitable proceeds, and the breakdown of charitable proceeds by type of game, for Edmonton. Proceeds from charitable gaming actually peaked in 2003 in Edmonton

at just under \$100 million, and showed some decline after that period. The mid 2000s featured a strong economy in the province, so this decline must be due to other factors. From Figure 19.11 proceeds from casinos are the dominant source of charitable proceeds. The fraction of charitable proceeds from casinos grew steadily over the period. Proceeds from bingos, like the overall trend in the province, decreased over the sample time. Proceeds from both pull tickets represent a tiny fraction of the proceeds generated in Edmonton. The decline in total charitable charitable proceeds in Edmonton after 2003 is attributable to a decline in raffles. Charitable proceeds from raffles in Edmonton peaked in 2003 at \$26 million, and declined markedly after that year. The reason behind this decline in proceeds from raffles is not clear, but it was sizable.

### Charitable Gaming Proceeds in Calgary

Figure 19.12: Total Charitable Gaming Proceeds in Calgary (millions)

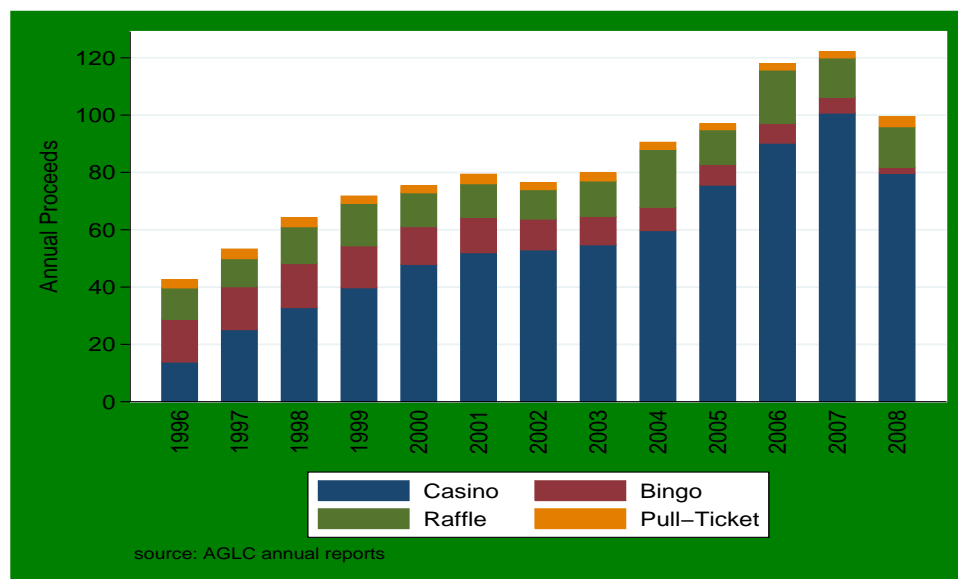


Figure 19.12 shows the total charitable proceeds, and the breakdown of charitable proceeds by type of game, for Calgary. Unlike in Edmonton, proceeds from charitable gaming in Calgary grew throughout the 2000s, and only declined in 2008. The total dollar value of charitable proceeds in Calgary and Edmonton were comparable until the late 2000s, when Calgary surged past Edmonton to generate about \$120 million per year in charitable gaming proceeds in 2006 and 2007. Like Edmonton, Calgary generates the highest charitable proceeds from casinos. In 2008, the proceeds were almost 80 million dollars. Proceeds from bingo declined from 14.99 million in 1996 to 2.11 million in the 2008-2009 fiscal year, mirroring the general decline in the popularity of bingo over the period. Proceeds from pull tickets, while small, increased in Calgary, much like in Edmonton. Charitable proceeds from raffles declined precipitously in Calgary after 2004, much like the decline

in Edmonton. The similar timing of this decline suggests that the factors the reduced interest in raffles were at work in both cities.

## Charitable Gaming Proceeds in Other Cities

This section discusses charitable gaming proceeds for cities other than Edmonton and Calgary. The AGLC annual reports define an “other” category as cities outside of Edmonton, Calgary, or First Nation jurisdictions in the province. While this aggregation combines data from a number of different localities, and obscures some potentially interesting features of the charitable proceeds data, we lack detailed data for charitable proceeds from other cities. This aggregation method assumes that patterns in charitable gaming proceeds from the other cities in Alberta can be meaningfully described by the total of these values across all cities. We recognize that considerable heterogeneity exists, and that this aggregation may omit some important information about charitable gaming proceeds.

Figure 19.13: Total Charitable Gaming Proceeds in Other Cities (millions)

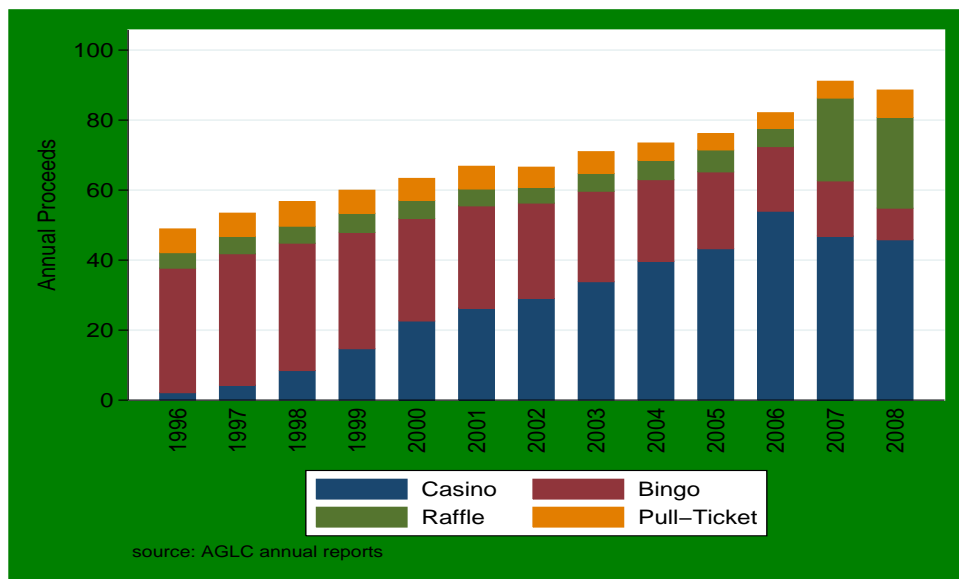


Figure 19.13 shows the proceeds from charitable gaming in other jurisdictions in the province. From the figure, cities in other areas have relied increasingly on casinos for the generation of charitable proceeds over this period. Casinos replaced bingo as the dominant source of charitable gaming proceeds in cities outside Edmonton and Calgary over the past 15 years. Note that the total value of proceeds from charitable gaming did not decline the other cities over this sample period. Whatever factors led to the decline in total proceeds from charitable gaming in Edmonton and Calgary were not at work in these other cities. From 19.13, cities generated just less than 75

percent of their total proceeds from bingo in 1996. But in 2008, bingo proceeds made up only 10 percent of the total charitable gaming proceeds. Replacing bingo were raffles which generated more than \$20 million dollars in 2007 and 2008. Again, this is in striking contrast to the situation in Edmonton and Calgary, where charitable proceeds from raffles declined over the period.

Overall, the patterns seen in these changes in the total amount of proceeds from charitable gaming and the composition of proceeds from charitable gaming in Calgary, Edmonton, and other cities show several interesting features over time. First, casinos are clearly the most important source of charitable proceeds in these cities, and the importance of casinos in generating charitable proceeds continues to grow all over the province over time. This has implications for the equity of generation of charitable proceeds, as the characteristics of casino gamblers differs from the characteristics of raffle ticket players and bingo players. As casinos become more important sources of charitable proceeds, casino gamblers become more important sources of these proceeds. Chapter 11 on page 193 describes casino gamblers in the province. Chapter 15 on page 233 described bingo players in the province. Second, bingo has diminished significantly in importance as a source of charitable proceeds in Alberta over the past 15 years. This mirrors the overall decline in the popularity of bingo shown in Chapter 15 on page 233. Third, pull tickets make up a tiny fraction of charitable proceeds in cities in the province. Fourth, while the total value of charitable proceeds declined in Edmonton and Calgary after peaking during the 2000s, charitable proceeds in other cities continued to grow over this period. The main culprit for the decline in total charitable proceeds in Edmonton and Calgary, and for the increase in the other cities, is charitable proceeds from raffles. If charitable proceeds from raffles begin to decline over the next few years in other cities, the source of this decline deserves more attention as charitable proceeds are an important source of operating funds for charitable organizations in the province.

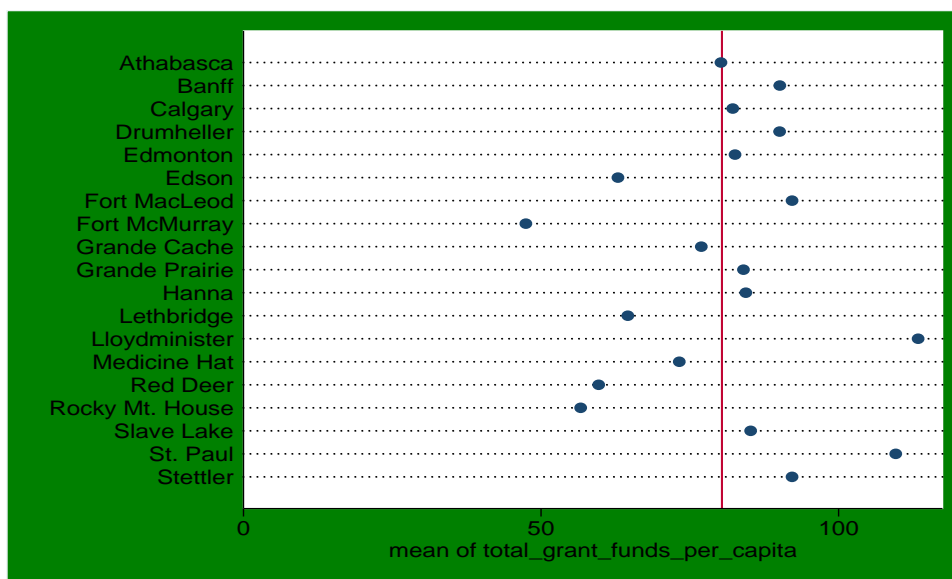
## **19.4 Alberta Lottery Fund Distributions by Census Division**

The Alberta Lottery Fund (ALF) draws revenues from slot machines and video lottery terminals (VLTs), as well as provincial ticket lotteries. Annual gambling revenues made available to the ALF are substantial, exceeding \$1.5 billion in recent years. The ALF distributes these gambling revenues across the province, funding a large number of community-based, volunteer, and public initiatives and providing money for government supplied goods and services. Section 10.2 on page 178 in Chapter 10 discusses the ALF in detail. The ALF website contains a wealth of information about the grants it awards in each year, including information about the value of the grants, the organizations that receive these funds, and the location of these organizations. We collected this information and, in this section, examine the spatial distribution of ALF fund distributions over the period 1998 to 2009. Overall, the total dollar value of grants awarded by the ALF increased over the period while the number of grants awarded decreased, implying an increase in the average size of grants over time.



Figure 19.14 shows the real annual average value of ALF grants awarded in each census division over the period 1998 to 2009 expressed in per capita terms to control for differences in the population of each census division. Like the graphs above, the scale on this graph is horizontal, so the farther to the right a dot is located on the graph, the larger the average annual value of ALF grants awarded per 1000 persons in that census division. The red vertical line is drawn at the provincial annual average of \$80 in ALF funds awarded per 1000 persons. Dots to the left of this line indicate census divisions with below average ALF funds awarded per capita and dots to the right of the line indicate census divisions with above average ALF funds awarded per capita.

Figure 19.14: Mean ALF Grant Dollars Awarded per 1000 Population

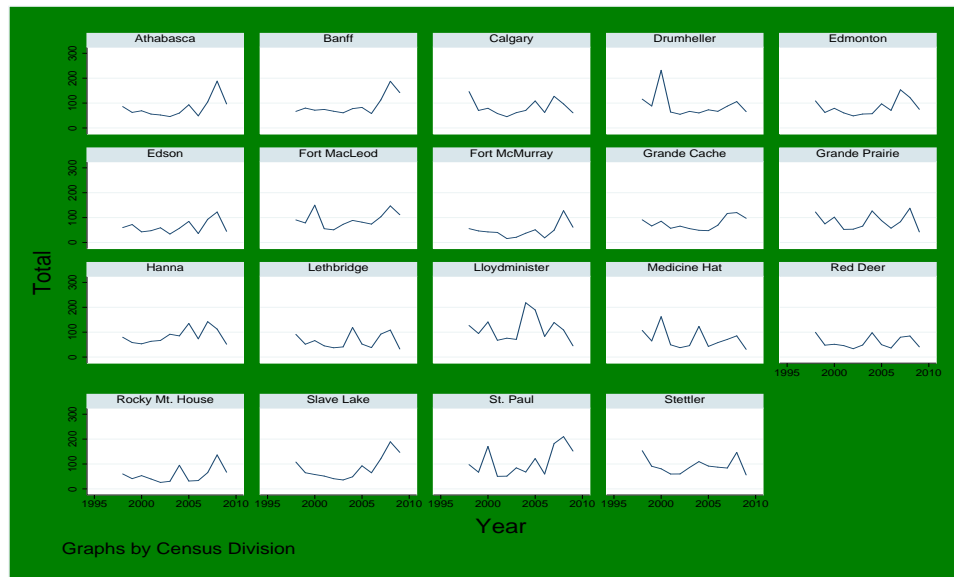


The average value of ALF awards per capita in census divisions shown on Figure 19.14 exhibits relatively little spread across census divisions, indicating that roughly the same amount of ALF funds are awarded in each census division. No value shown on Figure 19.14 is more than one standard deviation from the overall provincial average. The census divisions containing Lloydminster and St. Paul stand out as receiving relatively large annual average value of ALF awards per capita and the census division containing Fort McMurray stands out as receiving a relatively smaller annual average value of ALF awards per capita over the period.

Figure 19.15 contains time series plot of the real average annual size of the ALF awards made to organizations in each census division over the period 1998 to 2009. This graph indicates within census division changes in the intensity of ALF fund allocation over time. The important elements on these graphs are patterns in variation over time, including the level of variability, which indicate how variable award sizes are in each census division, and trends in award sizes over time.

A good deal of year-to-year variation in average grant size can be seen on Figure 19.15. A number of census divisions show large spikes in a specific years. For example, the census divisions

Figure 19.15: Mean Annual ALF Grants Awarded 1998-2009 (millions)

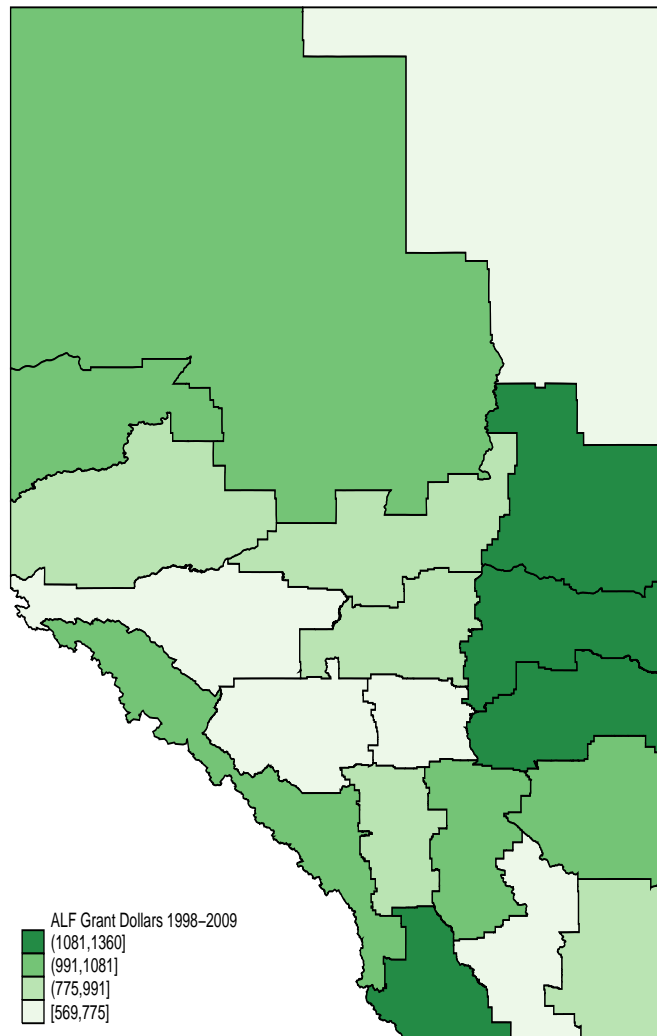


containing Athabasca, Banff, Drumheller, Fort McMurray, and Slave Lake show unusually large average grants in specific years. The census divisions containing Fort MacLeod, Grande Prairie, Hanna, Medicine Hat, Rocky Mountain House and St. Paul contain two such spikes. These probably represent unusually large individual grants in these relatively small census divisions. It is difficult to detect any significant trends based on a visual inspection of the graphs, and a formal statistical trend analysis would not be of much use in this small a sample. The high year-to-year variation also makes a formal trend analysis difficult.

ALF funds awarded, unlike some other economic variables, can have a cumulative effect in communities over time. In order to investigate differences in spatial variation of cumulative ALF funds awarded over time, we calculated the total ALF grant dollars awarded per capita, in real 2008 dollars, for each census division. Figure 19.16 summarizes this information. On Figure 19.16, the darker the color, the more total ALF grant dollars awarded in that census division. Census divisions with dark green shading were awarded the most ALF grant dollars per capita, and census divisions with light green shading were awarded the fewest.

Two patterns emerge on Figure 19.16. First, organizations in Calgary and Edmonton were awarded more cumulative ALF grant dollars over this period than organizations in Lethbridge and Red Deer. From Figure 10.3 on page 179, VLT revenues make up an important component of ALF revenues. From Figure 19.5, Red Deer and Lethbridge had higher net VLT revenues per capita than Calgary and Edmonton; net VLT sales provide an indication of the relative contribution of each census district to the ALF. So comparing the results on Figure 19.5 and those on 19.16 suggests that Red Deer and Lethbridge subsidized Calgary and Edmonton in terms of ALF grant dollars,

Figure 19.16: Total Real Value of ALF Grants 1998-2009



unless Calgary and Edmonton contributed more in percapita terms to the ALF through other fund sources like bingo and slot machines. Second, organizations in census division 7 (containing Stettler), 10 (containing Camrose and Lloydminster), 12 (containing St. Paul) and 3 (containing Fort MacLeod) received a relatively large cumulative share of ALF funds over the period 1998 to 2009. Clearly, the more ALF funds distributed to a census division, the better off the charitable organizations in those census divisions, and the better off the residents of those census divisions. So residents of these census divisions received relatively more ALF benefits per capita than residents of other census divisions.

## 19.5 Summary

One of the major research questions we set out to examine in this report is to determine the impact that gambling has by geography. To accomplish this, we use census divisions to partition the province spatially and to study the spatial impact of gambling. From this chapter, one of the major themes is that the province has done a good job of spatially distributing gambling opportunities. For example, lottery is the most popular game played and LTCs are generally evenly distributed across the province. On the other hand, VLTs appear to be distributed into areas that do not have as many gambling and other entertainment options for consumers. We also observe growth in net VLTs sales in the northern census divisions. One reason for this could be increases in the number of people that live and work in those census divisions due to the strength of the economy in the 2000s, especially the oil business. The trends in net VLT sales speak to the controversy over VLTs and also to the popularity of lottery in the province. It also indicates the ability of policy makers and gambling regulators to make each gambling product successful and appropriately distributed across the province.

When examining the distribution of ALF dollars across census divisions, we find that the eastern census divisions received relatively more ALF dollars than western census divisions. We also find that the distribution of ALF dollars and the distribution of VLTs are similar. VLTs are generally located in less populous rural areas in the province, and ALF funds are distributed back into those areas proportionately to help out in various social programs and infrastructure projects throughout these less populous regions. Finally, the distribution of ALF funds generates significant cumulative economic benefits to census divisions, if local organizations use the ALF funds widely.

## 19.6 Conclusions

The secondary data analyzed in this report contain significant geographical detail. This detail is helpful, because the population, gambling activity, and establishments in the gambling industry in Alberta are not uniformly distributed across the province. The flow of charitable funds from gambling, through the charitable gaming model that issues licenses to individual organizations, and grants made by the ALF are also not uniformly distributed across the province. Our analysis of the spatial distribution of VLTs and lottery ticket sales in Alberta census divisions leads to the following conclusions.

VLTs are popular in Northern Alberta and less popular in the relatively populous regions in central and southern Alberta containing Edmonton, Red Deer, Calgary and Lethbridge. The more populous areas have fewer overall gambling opportunities, and more alternative entertainment options, than less populous areas of the province. The distribution of VLTs per thousand persons

is greatest in four census divisions (CDs) in the province: CD 18 (Grande Cache); CD 14 (Edson); CD 7 (Stettler) and CD 4 (Hanna). This observation must be treated with caution, as part of this difference can be attributed to the huge differences in population across census divisions. Nonetheless, these relatively less populous CDs have a relatively high concentration of VLTs per capita. The provincial government capped the total number of VLTs at 6,000 in 1996; however, machines have been moved from community-to-community since that time. Our analysis of the distribution of VLTs across the province since 1996 shows that some communities have had an increase in the number of VLTs per capita (Edson, Grande Cache, Slave Lake, St. Paul) while others have experienced a decrease (Banff, Drumheller, Edmonton, Grande Prairie, Hanna, Lethbridge, Medicine Hat, Red Deer, Stettler)

The distribution of net VLT sales essentially track the higher distribution of machines per 1000 population in census divisions, with CD 18 (Grande Cache), CD 14 (Edson), and CD 4 (Hanna) having the largest average net VLT sales between 1994 and 2008. Changes in net VLT sales over time show a north-south difference, with VLT sales growing the fastest in northern Alberta census divisions and slower in southern census divisions. This may be because the northern communities are less populated, and contain fewer entertainment opportunities than in southern, more populated areas.

Lottery Ticket Centres (LTCs) are also somewhat more common in less populous areas if the province, especially in the census divisions containing Athabasca, Banff, Edson, Hanna, and Stettler; however, the variation in LTCs across the province is not as large as it is for VLTs. Average net lottery sales vary greatly, from the census division containing Fort McLeod (\$95 per 1000 population) to Fort McMurray (\$247 per 1000 population). However, lottery ticket sales trends suggest there is little year-to-year variation in most communities in the province.

One possible explanation for the observed spatial distribution of VLTs and LTCs is that VLTs and, to a lesser extent lottery play, have an important entertainment component. People like to play VLTs because participation provides entertainment. In densely populated urban areas like Calgary and Edmonton, people have access to a rich array of entertainment options, like movie theatres, plays, sporting events, etc., reducing the relative entertainment value of VLTs. In less populated rural areas, entertainment options are fewer, and the relative entertainment value of VLTs is larger, leading to more average net VLT sales per capita in these areas. The fact that VLTs are in bars and taverns in Alberta makes them a potentially attractive entertainment option in many rural communities.

VLTs are controversial in the province and some jurisdictions have banned VLTs through plebiscites. In areas like Fort McMurray where VLTs were banned, we observe an increase in lottery ticket sales. This shows that VLTs and lottery tickets may be substitutes in consumption, and also suggests that individuals have a fixed entertainment budget to spend on some type of

gambling activity, and continue to gamble even if access to their preferred form of legal gambling is eliminated or restricted.

The analysis of the distribution of charitable proceeds to Edmonton and Calgary leads to the following conclusions. Proceeds from charitable gaming in Edmonton peaked in 2003 at just under \$100 million and showed some decline thereafter. Most charitable proceeds come from casinos, and the relative contribution of casino revenues to total charitable proceeds grew steadily from 1996 to 2008. Proceeds from bingos decreased during this period, along with interest in bingo play across the province. While charitable proceeds from pull tickets remained stable, the main cause of the decline in overall charitable revenues since 2003 is attributable to the decline in raffles. Unlike Edmonton, charitable gaming proceeds in Calgary have grown steadily from 1996 to 2007, with a significant decline in 2008. Total proceeds in Calgary and Edmonton were virtually the same until the late 2000s when Calgary surged ahead of Edmonton to generate about \$120 million in 2006 and 2007. As in Edmonton, casino sales make up the bulk of charitable proceeds in Calgary, and declines in revenue are noted for both bingo and raffles. Other cities in Alberta have come to rely increasingly on revenues from charitable casinos, replacing bingos as the dominant form of charitable gaming revenue generation. In 2007 and 2008, revenues from raffles surpassed revenues from bingos in other cities in the province, unlike in Edmonton and Calgary. The relative contribution of casinos, raffles, and bingo to charitable gaming funds differs in smaller cities in the province, compared to Edmonton and Calgary.

The analysis of the distribution of funds from the Alberta Lottery Fund leads to the following conclusions. The average value of ALF awards per capita exhibits relatively little variation across census divisions in Alberta, indicating that about the same amount is awarded to each. From 1996 to 2009, there was a great deal of variation within census divisions in the average grant proceeds awarded in each year. A number of census divisions show significant spikes in a single year; however, no trend is discernable. On a per-capita basis, non-profit organizations in Calgary and Edmonton were awarded significantly more ALF funding than their counterparts in Red Deer and Lethbridge. Charitable organizations in CD 7 (Stettler), CD 10 (Camrose and Lloydminster), and CD 12 (St. Paul) and CD 3 (Fort MacLeod) received a relatively larger share of ALF funding over the period 1998 to 2009 than other census divisions. The census divisions on the eastern boarder of the province received the largest cumulative amount of ALF grant dollars in per capita terms.

Overall, the dollar value of grants distributed per capita in each CD shows close association to the total number of VLTs per capita in that CD. This suggests that charitable money flows back into communities in rough proportion to the generation of charitable money from gambling in communities. ALF grant funds do not flow from rural areas to urban areas in the province. Little urban-rural cross subsidization appears to have taken place in the past.

## 19.7 Implications

In per capita terms, gambling, specifically VLTs and LTCs, are relatively more popular in rural areas in the province than in urban areas. This suggests gambling has a strong recreational and entertainment component, as rural areas have fewer recreational opportunities outside of home-based entertainment like television and the internet while urban areas contain relatively more entertainment options, in terms of cultural activities, movies, sporting events, restaurants and shopping. The entertainment and recreational benefits of legal gambling opportunities have value to the residents of rural areas in the province, and this value should be taken into account when locating VLTs and determining the total number of VLTs in the province. Also, people appear to travel long distances participate in casino gambling. While a few casinos have opened in rural areas in the past, most casinos are in the urban areas in Alberta. Given the large consumer surplus from casinos documented in Chapter 6 and the important contribution of casino gambling revenues to charitable organizations documented in Chapter 10, providing increased access to casino gambling opportunities in less populous areas of the province might generate important additional benefits to many parts of society.

The charitable gambling model, and the ALF appear to allocate charitable funds relatively evenly across the province. Since the size of these charitable funds are relatively large, this means that the overall benefits of these funds, in terms of community projects and organizations financed and the additional community-based benefits generated by these activities, are also evenly distributed over the province. The operation of the charitable gambling model and the ALF appear to provide appropriate spatial distribution of benefits.

## Part V

# Implications



## Chapter 20

# How Much Gambling is “Right” for Alberta?

What do the conclusions discussed above imply about the current state of legal gambling in Alberta? How can they be used to increase understanding of the role of gambling in Alberta? How can they help policy makers who determine the amount of legal gambling available in the province?

The American economist Alan Blinder once pointed out that economists have the most policy influence in areas they know the least about, and the least policy influence in areas they know the most about. This observation can be generalized a bit to illuminate an important point about the relationship between research, the public interest and policy making. The public needs clear answers to important questions like “will the overall effect of increasing the amount of legal gambling available in the province be positive or negative?” in order to make informed decisions. Policy makers need answers to such questions as well, in order to make good choices for society. Sadly, researchers are poorly equipped to answer this sort of question. Researchers succeed by extending the existing knowledge in their discipline incrementally (they succeed wildly by pushing the discipline forward by a large increment, but occurrences of this sort of breakthrough are exceedingly rare in all disciplines). Showing that an accepted result holds in a slightly different setting, or in a slightly more general sense, leads to publications in peer-reviewed journals, respect from peers, tenure, and modest annual salary increases in academia. Answering big, important, hard questions valued by society does not. In addition, careful researchers fully understand the limitations of their data, methods, and tools, as well as the limits of their disciplinary insights. As a result, researchers tend to be confident in conclusions that the general public, and policy makers, have little appetite for, and the general public, and many policy makers, tend to view researchers as serial equivocators who possess huge amounts of knowledge about trivial topics of little use to their pressing needs.

We have worked on this research project for more than two years, and have much more experience with research and informing the general public and policy makers than when we started. We

thoroughly understand the limitations of our data, methods, framework, and analytical tools. We have pointed out the limitations and caveats associated with this research repeatedly, and completely in the chapters above. In the following sections, we hazard a few observations about the meaning of this report, in terms of the desirability of the current level of legal gambling in the province.

## 20.1 Problems Assessing the Overall Socioeconomic Impact of Gambling

The SEIG framework developed by Anielski and Braaten (2008), while useful in that it contains a thorough enumeration of the areas where gambling affects society, remains problematic because it represents the first steps toward an attempt to thoroughly quantify all costs and benefits generated by gambling. The next logical step in such a process is to add up the quantified costs and benefits in order to arrive at a single number that reflects the net effect of gambling on society. Never mind that methods do not currently exist that would allow a researcher to quantify many of the benefits and costs of gambling, any sort of enumeration of the specific parts of society affected by gambling, this one, Anielski and Braaten's (2008) or any other SEIG based analysis, invites some form of cost/benefit accounting.

In our opinion, such an overall accounting serves no useful purpose, and can only distract attention from more important issues and questions that can be answered given existing methods and data. Existing methods do not permit precise estimates of the monetary value of intangible costs and benefits. Worse, any SEIG framework, including ours, commits the sin of double counting. This problem is difficult to avoid, and the construction of any SEIG framework requires the researcher to trade off comprehensive coverage of impact areas against double counting.

Worse, any SEIG framework invites the quantification of everything identified, with no regard to whether any particular factor could be, or even should be quantified. Once a dollar value estimate is developed for some subset of factors, the next natural question is "what's next on the list?" This invites researchers to come up with *some number* no matter how heroic the assumptions required to generate that number. Filling in all the spaces creates a false sense of precision, and also feeds the desire on the part of policy makers to have a simple, easy to comprehend bottom line assessment to make their decision easier.

In addition, a formal cost/benefit accounting also implicitly includes value judgements on the part of the researcher. If we add up the positive and negative impacts of gambling, some weighting scheme must be used to arrive at a final tally. This problem is typically swept under the table, or addressed by some neutral method like weighting each dollar of cost and benefit equally. However,

this approach still requires a value judgement. Weighting dollars of cost equally implicitly assumes that all dollars are equal in value. While it might be reasonable to assume that a dollar of consumer surplus generated by a trip to a casino is equal to a dollar of cost associated with a personal bankruptcy caused by problem gambling (and the associated intangible costs to a family associated with that bankruptcy), clearly, many people in the province would not agree with that weighting scheme, and would place different weights in those costs and benefits.

Because of these problems, we do not undertake any sort of formal cost/benefit accounting based on the impacts described above. Instead, we have identified, described, and evaluated the impacts associated with gambling in Alberta. Each individual reader of this report can consider the impacts separately, and in total, and apply whatever personal weighting scheme deemed appropriate. We simply make a few broad comments on the impacts, and the general perception of these impacts in society, and other SEIG studies.

## 20.2 Assessing Impact in SEIG Studies

SEIG frameworks provide a road map for locating the many and varied impacts of gambling on society, but they don't have much to say about what is going on when you get there. In general, our reading of other SEIG studies indicates that costs are generally emphasized and benefits generally given less emphasis in many SEIG studies. In part, this is because costs are relatively easier to quantify, even if costs that can't actually be attributed to gambling. For example, Grinols and Mustard (2006) concluded that the presence of casinos in counties in the US was associated with increased violent crime three to five years after the casinos opened. Grinols and Mustard (2006) also estimated the incremental policing cost associated with this increase in violent crime. Walker (2008a, 2008b) pointed out that, just because crime went up, this does not necessarily imply that policing costs increased, since most policing costs are fixed, not incremental. While some incremental policing costs would have been incurred as a result of increased crime in those US counties, estimating that incremental cost from existing budget data may or may not be possible. A significant amount of government budget data are easily accessible on the web, greatly increasing the temptation to attempt this sort of cost estimation. The existence of a large volume of related data does not guarantee that reasonable incremental cost estimates can be generated from those data.

Many of the benefits associated with legal gambling are either intangible or indirect in nature. This makes it relatively more difficult to identify, assess, and quantify the benefits from gambling. Throughout this report, we have tried to stress both benefits and costs; we believe that this balance distinguishes this report from others. We identified a number of important benefits of gambling in Alberta. The gambling industry generates a significant number of jobs and payroll in the province.

The gambling industry is not as large or as important as the construction industry, as many as 10,000 people work in the industry, most in full time positions. New hires into jobs in the industry come from the ranks of the employed and unemployed. These workers pay taxes and contribute to consumer demand in the province. The provincial government also benefits from revenues generated by legal gambling. Remitted gaming profits account for about 4% of own source revenue in Alberta, and that fraction has grown over time.

Gambling has an impact of tourism in the province. A considerable number of visitors to the province report going to a casino during their visit. On the other hand, Albertans also visit casinos when traveling outside the province. Most importantly, casino visits generate significant consumer surplus in the province. The value of this consumer surplus appears to be in the neighborhood of \$100 million per year – roughly equal to the annual payroll in the entire gambling industry. In a similar vein, gambling participation rates are high in the province. Millions of Albertans participate in some sort of gambling activity each year, and the vast majority derive consumption benefits from this participation. In addition, participation in gambling, especially casino gambling, appears to be associated with higher self-reported happiness and lower self-reported stress among Albertans. Even though many of these benefits are intangible in nature, this does not diminish their importance in any complete SEIG analysis.

Finally, charitable organizations in communities throughout Alberta derive funds from both the charitable gambling model in the province and Alberta Lottery Fund grants. Over the period 1996-2008, more than \$3.1 billion was distributed in Alberta through charitable gaming licenses to charitable groups in communities all over Alberta. In addition to this amount, over the period 2009-2018 more than \$3.5 billion was distributed to communities through Alberta Lottery Fund grants. These \$6.6 billion dollars clearly made a significant impact on Albertans, enhancing the quality of life, providing valuable goods and services not supplied by the market of the government, and helping those in need. This funding also freed up government resources to fund other valuable services like education and health care in the province.

An increase in the availability of legal gambling would increase all these benefits to some extent. The exact amount of increase is impossible to predict with any accuracy, because the increase from additional legal gambling opportunities may not be the same as past increases. Also, the overall increase in total benefits will vary with the type of legal gambling that is expanded. The report discusses the differences in detail. In general, casino gambling would appear to generate the largest increase in total benefits. The size of the increase in total benefits will also depend on the spatial location of the new legal gambling activities. The benefits in rural areas clearly differ from the benefits in urban areas, due to the larger number of entertainment activities in cities like Edmonton and Calgary.

Of course gambling generates significant costs across society. Government must fund regulation and oversight of the industry. Gambling may contribute to incremental social service costs, although

these costs are difficult to estimate. Gambling may also contribute to incremental infrastructure costs, which are also difficult to estimate. Gambling has been associated with personal and business bankruptcy and financial distress, and we have some weak evidence that past increases in legal gambling led to some additional financial distress in the province.

The biggest cost associated with gambling comes from problem gamblers. Problem gambling is a terrible, and inevitable consequence of the presence of gambling—both legal and illegal—in society. Problem gambling destroys lives and families. It affects the problem gambler and a large number of people connected to the problem gambler. The costs of problem gambling include financial costs associated with bankruptcy, job absence and job loss, emotional and psychological costs borne by the problem gambler, family and friends, premature death, and other significant health costs. Problem gambling has been associated with domestic violence and substance abuse in clinical studies. These costs are not confined to problem gamblers and their friends and family. Society also bears costs in terms of operating treatment centers and lost productivity. However, we have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult this report when it is made available.

We found mixed evidence in the relationship between gambling and crime in the province. Past variation in legal gambling availability was associated with increases in some types of crime, and decreases in others. In any event, problem gamblers are more likely to commit crimes, even if we cannot identify the effect of this in our secondary data analysis. Some incremental policing and judicial costs are incurred as a result of problem gambling, although the size of these costs may be small. Finally, casinos generate traffic and may lead to a loss of community aesthetics, although beauty lies in the eye of the beholder.

An expansion of legal gambling opportunities also increases the total costs of gambling in society. Just like the total benefits, the amount by which total costs increase in response to an increase in the availability of legal gambling is difficult to determine. The increase in total costs will depend on the specifics of the type and location of the expansion in legal gambling opportunities.

An expansion of the gambling industry could also lead to lower employment and output in some other industries, to the extent that gambling is a substitute for other consumer goods and services. For example, if consumer demand shifts to the gambling industry, budget constraints guarantee that spending declines on other household goods and services. There is little evidence of such substitution in this report, but it could take place in the future, depending on the size and nature of any increase in legal gambling.

The primary factor determining how much the total cost of gambling to society will increase in response to an increase in the availability of legal gambling is the effect of the increase in legal

gambling on the problem gambling incidence rate. If increased legal gambling opportunities increase the incidence of problem gambling, the increase in the total cost of gambling to society will be more than proportionate. This is because each additional problem gambler generates significant costs across society. The volume from the University of Lethbridge research team addresses problem gambling incidence rates in detail, and will provide important information about the relationship between legal gambling availability and problem gambling incidence rates. We have not been given access to the results and conclusions about problem gambling rates contained in the final report by the University of Lethbridge. Interested readers should consult this report when it is made available.

The overall impact on society of an increase in legal gambling opportunities depends on the relative size of the increase in total benefits and total costs. If the marginal increase in total benefits exceeds the marginal increase in total costs, society is better off. If the marginal increase in total costs exceeds the marginal increase in total benefits, society is worse off. Again, any accounting-type valuation of these marginal increases in total benefits and total costs would be subject to the weighting caveat identified above.

Of course a decrease in the availability of legal gambling opportunities would, in general, reduce both benefits and costs. The overall impact on society again depends on the relative size of the marginal decrease in total benefits and costs. However, a hypothetical decrease in legal gambling opportunities entails two additional elements. First, the government revenues generated by gambling revenues have potentially large opportunity costs, as general taxes would have to be raised to offset the loss in revenue, or existing government services in areas unrelated to gambling would have to be reduced. In this case, the opportunity cost is asymmetric. Second, the incidence of problem gambling may not decline in response to a decline in the legal gambling opportunities. Ample illegal, and quasi-legal, opportunities to gamble exist, for example on the internet. If problem gambling rates do not decline when legal gambling opportunities decline, then society will be made unambiguously worse off by a reduction in legal gambling opportunities.

## Chapter 21

# Additional Research

This report does not answer all the important questions about the impact of gambling in Alberta. In this chapter, we identify five main areas for additional research revealed by our analysis. Certainly there are other additional research topics identified in a report this large and broad in scope. We choose to focus on these five areas because we believe they are the most important from both an academic standpoint and a public policy standpoint.

It is extremely unlikely the provincial government will make a policy decision to abandon legalized gambling in Alberta in the foreseeable future. However, it is conceivable the face of gambling will change in the province, influenced by factors including Albertans waning interest in gambling, as is the case with bingos and raffle ticket sales in Edmonton and Calgary. To the extent gambling provides a type of voluntary tax that comprises almost 5% of all provincial revenues, a downturn in gambling participation could have a significant effect on government finances. That said, it seems that policy research that examines diminished gambling revenue scenarios along with prospective fiscal responses, including increases in income tax or the introduction of a provincial sales tax, would be a prudent undertaking.

In Chapter 5, in section 5.5 on page 84, we discuss some recent research on the effect of proximity to casinos on owner-occupied residential housing units in the United States. This research concluded that proximity to a casino increased housing values by about 2%. Unfortunately, we were unable to locate an appropriate secondary data source to carry out a similar analysis in Alberta. However, given that data exist in the US, a researcher with better knowledge of Canadian housing markets could be able to locate an appropriate secondary data source to carry out this type of analysis in Alberta.

We tried to determine the impact gambling has on crime in the province by analyzing data from the UCR survey to examine the impact that casinos and VLTs have on certain types of

crime. Our analysis shows uncovers a relatively weak statistical link between these gambling types and crime. Our own population survey asked participants whether gambling was a factor in the participant committing a crime; however, we received only 5 affirmative responses from 15,000 Albertans surveyed to this question. Future research in this area can further examine specific jurisdictions that open new gambling venues to see whether or not the opening of a venue causes an increase in crime. In addition, we know that some jurisdictions have banned certain types of games. Future research could examine if the elimination of certain types of games or the closing of facilities such as casinos and racetracks is statistically related to a decrease in the crime rate for these jurisdictions.

Another important area for future research is a comprehensive examination of the effects of First Nation casinos. Generally, these casinos are located around people who are not as wealthy as the general population. Future research could examine the impact that First Nations casinos have on crime in that region. Finally, one could examine the presence of casinos and how that affects people's insurance rates. Even though casinos may not be linked to an increase in crime, if the perception exists that casinos cause an increase in crime, that could be reflected in the insurance rates of citizens living around the casino, all other factors equal. Examining this perception would add to an already extensive literature in the area of gambling and crime. Finally, one needs to be careful in attributing any sort of crime increase to casinos. Potentially this could be due to an increase in economic development as a whole. Isolating a particular effect that a casino has and not the overall economic development is crucial in moving this stream of research forward as well as addressing one of the criticisms that Walker (2007) states in his critique of socioeconomic impact studies.

In Chapter 8, we find gambling on casino table games reduces participants level of stress and makes participants happier. These results are unique to only this type of game as the other games examined did not report any statistically significant results to this magnitude. The relationship between casino gambling and the reduction of stress and health needs to be addressed in future research. A more refined survey that focuses on table games and its health properties could examine this result. In addition, key informant interviews may shed additional information regarding individual feelings in regard to their perceptions about the health benefits after participating in casino table games.

Policy research on the amount and proportion of gambling revenues distributed through the Alberta Lottery Fund should be undertaken, given that total revenues to both non-profit, community organizations and the provincial government total billions of dollars each year. This analysis should examine: the proportion of funds remitted to the provincial treasury, non-profit community organizations, and First Nations; the mix of funds allocated to types of non-profit groups (e.g., community development vs agricultural); the implications for community groups should AFL funding decrease; and other similar policy questions.



We have documented throughout this report a steep decline in bingo. Why has interest in bingo tapered off in Alberta and what can/should be done about this, if anything. Does the province need to change the delivery of the game or where the bingo halls are located? In Chapter 8, we find that bingo players are less happy than non bingo players. Is this a function of the type of person, is it a function of the game, or a combination of both? These are the types of questions that policy people need to sit down and brainstorm regarding the role of bingo within the province's gambling "portfolio" as bingo has had a long-standing tradition in Alberta of providing sustaining funding to community organizations for good works.

The chapter on community impacts does not examine characteristics of the individual charities and non-profit groups that receive individual licenses for charity gaming, nor does it examine the direct impact of charitable gaming money on these organizations and how these funds affect these organizations. A thorough analysis of these topics would be a useful extension of this research. In addition, future research should identify non-profit organizations that do not take gambling money and explore their views on the charitable gaming model used in Alberta, among other things. The ALF database contains a wealth of information on individual grant awards and the organizations that get them. Future research could also examine the categories of grants that money from the ALF is awarded to and perform a more detailed analysis of the impact in specific sectors of Alberta.

## Part VI

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## Part VII

# Appendices

## Appendix A

# Alberta Gambling Time Line

Table A.1: Alberta Gaming History and Facts

Year	Event
1892	*The Criminal Code of Canada is amended to tolerate gambling under certain conditions.
1910	*An amendment to the Criminal Code of Canada allows pari-mutuel betting and participation in games of chance where profits are used for charitable or religious purposes. Some gaming is allowed at agricultural fairs and exhibitions.
1920s	*Bingo is played in community halls and church basements. The popularity of horse racing grows.
1950s	*Illegal sale of Lucky 7 jar tickets (pull tickets) occurs until the 1970s, when the sale of pull tickets is legalized.
1967	*Alberta's first charitable casino opens at Edmonton's annual fair.
1969	*Amendments to the Criminal Code of Canada authorize lotteries and sweepstakes. Provinces have the authority to licence and operate lotteries and casinos.
1970s	*Edmonton's Northlands Park and the Calgary Exhibition and Stampede start holding sweepstakes.
1975	*An Edmonton Kinsmen Club establishes Alberta's first not-for-profit casino. *The first-ever lottery ticket, The Western, is sold.
1979	*Lotteries are now exclusively under provincial authority.
1980	*Cash Casino, Alberta's first permanent, privately operated charitable casino opens in Calgary.

Year	Event
1981	*Casino ABS, Alberta's second permanent, privately operated charitable casino opens in Edmonton.
1982	*Lotto 6/49 is launched.
1985	*A government lottery review gathers Albertans' views on the disbursement of unused lottery revenue. *An amendment to the Criminal Code of Canada allows provinces to operate mechanical gaming devices.
1986	*Casino ABS South (now Casino Edmonton) opens in Edmonton.
1987	*Revenue pooling becomes an option for casinos and bingo associations.
1988	*Frontier Casino (later "Stampede Casino") opens in Calgary. *Bill 10 establishes the Alberta Lottery Fund.
1989	*The first horse racing simulcast takes place at Calgary's Trout Springs. *Elbow River Casino opens in Calgary.
1990	*Teletheatre betting is introduced in the province. *Sandman Inn Casino in Edmonton opens but closes after seven months in operation. *Palace Casino in Edmonton opens.
1991	*Video lottery terminals (VLTs) are tested at summer fairs in Edmonton and Calgary.
1992	*The VLT program is officially introduced.
1993	*Casino ABS (now Casino Lethbridge) opens a facility in Lethbridge.
1994	*Alberta Lotteries and Gaming releases a commissioned report on gaming behaviour and problem gambling in Alberta. *The Alberta Alcohol and Drug Abuse Commission (AADAC) receives funding for problem gambling treatment, research and education. *Gold Dust Casino opens in St. Albert. *Fort McMurray casino (now Boomtown Casino) opens as a small temporary operation.
1995	*The Lotteries Review Committee releases "New Directions for Lotteries and Gaming: Report and Recommendations of the Lotteries Review Committee" following public consultations. Government establishes new policies for gaming in Alberta after adopting several recommendations from the report.

Year	Event
	<p>*The Alberta Gaming and Liquor Commission (AGLC) is created by combining the responsibilities and operations of the Alberta Liquor Control Board, Alberta Lotteries, the Alberta Gaming Commission, Alberta Lotteries and Gaming and the Gaming Control Branch.</p> <p>*Cash Casino opens a permanent facility in Red Deer.</p>
1996	<p>*The MLA Committee on Native Gaming releases its report and recommendations on native gaming in Alberta.</p> <p>*Slot machines are introduced into Alberta's charitable casinos.</p> <p>*Satellite bingo is introduced.</p> <p>*The Alberta Racing Corporation is formed to help revitalize the horse racing industry in Alberta.</p> <p>*Baccarat Casino opens in Edmonton.</p> <p>*Frank Sisson's Silver Dollar Casino opens in Calgary.</p> <p>*Casino by Vanshaw opens in Medicine Hat.</p>
1997	<p>*VLTs are removed from Rocky Mountain House and Sylvan Lake following local plebiscites. Plebiscites are also held in Barrhead, Wood Buffalo (including Fort McMurray) and Lacombe.</p> <p>*Barrhead votes to keep VLTs.</p> <p>*Wood Buffalo votes to remove VLTs, but retailers take legal action.</p> <p>*Casino Calgary opens.</p> <p>*Jackpot Casino opens in Red Deer.</p>
1998	<p>*Community Lottery Boards are established by the Alberta government to oversee the distribution of an additional \$50 million in lottery funds.</p> <p>*The Alberta Lotteries and Gaming Summit is held in Medicine Hat. Government accepts all eight summit recommendations.</p> <p>*During the October 19 civic elections, VLT plebiscites are held in 36 Alberta municipalities. Six municipalities, (County of Lethbridge No. 26; Town of Lacombe; Municipal District of Opportunity No. 17; Town of Canmore; Town of Coaldale; Town of Stony Plain; and the Regional Municipality of Wood Buffalo) vote to have their VLTs removed.</p> <p>*VLT retailers take legal action.</p> <p>*Courts rule the Alberta government cannot direct the AGLC to remove VLTs from municipalities unless there is specified legislation in place. Government passes legislation to remove VLTs from Wood Buffalo and the six communities that voted against VLTs.</p>

Year	Event
1999	<p>*Bill 36, the Gaming and Liquor Amendment Act, is passed on May 19, giving the Minister authority to give policy direction to the AGLC and to terminate VLT retailer agreements in municipalities that voted in favour of VLT removal.</p> <p>*The Alberta Court of Queen's Bench grants an interim injunction on May 20, prohibiting the AGLC from disabling or removing VLTs pending the constitutional challenge of Bill 36.</p> <p>*AGLC launches a Bingo Industry Review to examine the bingo industry and charities that take part in bingo activities.</p> <p>*The Ministry of Gaming is created, which incorporates the Department of Gaming, the Alberta Gaming and Liquor Commission, the Community Lottery Program Secretariat, the Alberta Gaming Research Council. The new ministry also has responsibility for the Horse Racing Alberta Act.</p> <p>*An agreement between the Government of Alberta and the province's three major universities results in a leading-edge research institute to study gaming issues in Alberta. The Alberta Gaming Research Institute, a consortium of the Universities of Alberta, Calgary and Lethbridge, will sponsor research into the social and economic aspects of gaming, aboriginal gaming issues, gaming trends and other related gaming topics.</p> <p>*The Deal Us In program is launched. The program teaches registered gaming workers employed in casinos and racing entertainment centres what responsible gambling is and how to promote healthy attitudes towards gambling.</p> <p>*The Great Northern Casino opens in Grande Prairie.</p> <p>*Alberta Gaming initiates a review of gaming licensing policies and processes. While the review is underway, consideration of requests to licence or approve new casinos, casino expansions and relocations, new games and gaming environments are suspended.</p>
2000	<p>*Government announces the implementation of the majority of recommendations from the Bingo Review Committee.</p> <p>*The AGLC teams up with the Alberta Alcohol and Drug Abuse Commission (AADAC) and the gaming industry to develop new programs to assist problem gamblers, including the Casino and Racing Entertainment Centre (REC) Voluntary Self-Exclusion (VSE) Program and Deal Us In.</p> <p>*The governments of Alberta, Saskatchewan and Manitoba signed a new agreement with the Western Canada Lottery Corporation, resulting in cost savings to the AGLC of approximately \$2.2 million per year.</p> <p>*Casino Yellowhead opens in Edmonton as the largest gaming facility in the province (75,000 sq. feet).</p>

Year	Event
	*Boomtown Casino opens permanently in Fort McMurray.
2001	<p>*The Alberta government introduces a new First Nations Gaming Policy, based on Alberta's unique charitable gaming model. First Nation casinos will be located on reserve land, will be regulated by the AGLC and operate under the same terms and conditions as off-reserve casinos.</p> <p>*The government releases the Gaming licensing Policy Review (GLPR), which includes 61 recommendations that were developed during a comprehensive, 20-month review of gaming policies.</p>
2002	<p>*The moratorium respecting new casino facilities is removed on March 1, after the AGLC developed specific casino terms and conditions to manage and control gaming expansion in the province, consistent with the policy direction provided by government as a result of the Gaming Licensing Policy Review.</p> <p>*The AGLC reviews the Gaming and Liquor Act and Gaming and Liquor Regulation in order to ensure gaming and liquor activities are conducted with integrity. This review results in Bill 14, the Gaming and Liquor Amendment Act, which was debated and passed in the spring legislature session and came into effect in May.</p> <p>*Bill 16, the Racing Corporation Amendment Act, is debated and passed in the spring legislature, effective in May.</p> <p>*The Community Lottery Board program is discontinued.</p> <p>*The Community Initiatives Program is introduced on June 24 and commits \$30 million per year for the next three years.</p>
2003	<p>*The Alberta Lottery Fund website is launched, and funding increases by 25 per cent to the foundations and granting programs supported through the Alberta Lottery Fund.</p> <p>*The AGLC honours the 1997-1998 plebiscite results and removes nearly 200 VLTs from seven communities across the province.</p> <p>*DIGI Bingo and Keno are introduced into bingo halls across the province in order to help revitalize the bingo industry.</p>
2004	<p>*The VLT Replacement Project is completed. Alberta's 6,000 VLTs are replaced with updated machines that feature new games and responsible gaming features.</p> <p>*The AGLC establishes a Social Responsibility Division for the gaming and liquor industries.</p> <p>*The GAIN program is introduced to assist charitable groups to better understand the gaming industry, and the responsibilities and requirements tied to a gaming licence. The goal is to make sure charitable groups are accountable for the funds they raise and spend.</p>

Year	Event
2005	<p>*Deerfoot Inn and Casino opens in Calgary.</p> <p>*The first private bingo facility to operate under Alberta's charitable gaming model is approved for Grande Prairie.</p> <p>*Lotto 6/49 is re-launched as a \$2 ticket with larger jackpots and more chances to win.</p> <p>*"Mystery" progressive slot machines that can pay out any time on a winning or non-winning combination are introduced at five Alberta casinos: Casino Yellowhead and Palace Casino in Edmonton, and Casino Calgary, Cash Casino and Elbow River Casino in Calgary.</p>
2006	<p>*River Cree Resort and Casino opens on the Enoch Reserve adjacent to the City of Edmonton. It is the first casino to open under the province's First Nations Gaming Policy. The Alberta government modifies policies to allow First Nations charities more flexibility to spend charitable gaming proceeds.</p> <p>*Century Casino and Hotel opens in Edmonton.</p> <p>*The AGLC, in partnership with the Alberta Alcohol and Drug Abuse Commission (AADAC), launches a new responsible gambling pilot. The two-year pilot project features a Responsible Gambling Information Centre (RGIC) at the Palace Casino in Edmonton. A second centre opens at Calgary's new Deerfoot Inn and Casino.</p> <p>*The Ministry of Gaming is eliminated following a December government reorganization. The AGLC is added to the portfolio of the Ministry of the Solicitor General and Public Security.</p>
2007	<p>*Casino Camrose opens.</p> <p>*Casino Dene opens on the Cold Lake First Nation.</p> <p>*Grey Eagle Casino opens on the Tsuu T'ina First Nation near Calgary.</p> <p>*The responsible gambling awareness training program, A Good Call, is launched. The program teaches registered bingo workers employed in bingo halls what responsible gambling is and how to promote healthy attitudes towards gambling.</p> <p>*The Honourable Fred Lindsay, Solicitor General and Minister of Public Security, responsible for the AGLC, announces Alberta's first annual Responsible Gambling Awareness Week to be held October 22-28.</p>
2008	<p>*Stoney Nakoda Resort and Casino opens in Kananaskis on First Nations land.</p> <p>*Eagle River Casino and Travel Plaza opens in Whitecourt on First Nations land.</p>
2009	<p>*Rocky Mountain House bar owners/operators present a petition to town council to abolish the VLT ban. A plebiscite is held in July and residents vote in favour to maintain the ban.</p>



Year	Event
	<p>*16 Responsible Gaming Information Centres (RGICs) in place in Alberta: 15 in casinos and one at Edmonton Northlands.</p> <p>*Lotto Max, Canada's biggest lottery, replaces Super 7.</p>

Source: <http://www.aglc.gov.ab.ca/gaming/gaminghistoryfacts.asp>

## Appendix B

# Population Surveys of Gambling in Alberta

### B.1 Survey Description

As part of the socioeconomic impact analysis of gambling in Alberta undertaken for this study, two waves of computer-assisted telephone surveys of the population of Alberta were undertaken. Each wave was supplemented by a corresponding on-line survey drawn from a non-representative convenience sample of Albertans maintained by a survey research firm, ConsumerConnect. The surveys assessed public attitudes toward gambling held by Albertans, the gambling behavior of Albertans, and questions used to determine the prevalence of problem gambling in Alberta. The first wave took place in 2008 and the second wave took place in 2009. Both waves contained a computer assisted random digit dial telephone survey and an supplemental on-line survey. These population surveys were designed and overseen by Professor Robert Williams of the University of Lethbridge. Preliminary data cleaning was performed by the University of Lethbridge SEIGA research team.

Three separate surveys were performed in each wave: a general population survey, a targeted population survey that oversampled individuals from communities with newly opened casinos, and a supplemental on-line survey. Table B.1 shows the number of observations in each of the types of survey in each wave.

As would be expected, the surveys did not reach a population that was perfectly representative of the general population of Alberta. Neither the population survey nor the on-line survey matched the age-sex distribution of the Province of Alberta based on the 2006 Census, the most recent Census available. Table B.2 shows the age-sex distribution of Alberta's population in the 2006 Census and

Table B.1: Number of Observations by Type of Survey and Survey Year

Survey Type	Survey Wave		
	2008	2009	Total
General population survey	3,001	1,004	4,005
Targeted population survey, communities with casinos	4,512	3,624	8,136
Online survey	2,019	1,006	3,025
Total Observations	9,532	5,634	15,166

the age-sex distribution of the 2008 wave and 2009 wave population and on-line surveys. Each cell contains the count of individuals with that age-sex characteristic. So, for example, according to the 2006 Census there were 175,140 males in Alberta between the age of 18 and 24. There were 80 males aged 18 to 24 in the 2008 population survey.

The age-sex counts from the Census and surveys can be used to create population weights that correct the survey samples for any bias due to the survey sample not matching the survey population along specific observable characteristics. In this case, the population weight for each of the four surveys is shown in the column to the right of the count in each age-sex cell. For example, each of the 80 males aged 18 to 24 in the 2008 population survey correspond to 2,189 males aged 18 to 24 in Alberta. Individuals who did not respond to the age question were given a population weight equal to the sample average population weight.

Population weights can be used to adjust results from surveys to reflect the underlying population. These age-sex population weights were used in this report in a number of places. For example, the demographic characteristics of different types of gamblers were calculated using these population weights. Weighting a targeted population survey requires design weights we do not have access to because of the geographic stratification used to obtain that sample.

## B.2 Measuring Gambling Expenditure

One of the goals of the population surveys was to understand current gambling behavior of Albertans. One element of this was to understand how much Albertans spend on gambling. The survey contained questions on spending of the following form:

*Roughly how much money do you spend on lottery tickets in a typical month? Spend means how much you are ahead (+\$) or behind (-\$), or your net win or loss in an average month in the past 12 months. (Note: all gambling expenditure figures in the data file have to be preceded by a '+' or '-' or else have separate columns for losses versus wins.)*

Table B.2: Age-Sex Characteristics of Alberta and Samples, Population Weights

Males Age	Alberta in 2006	Pop Survey	2008			2009			Weight
			Weight	On-line Survey	Weight	Pop Survey	Weight	On-line Survey	
18 to 24 years	175,140	80	2189	82	2136	20	8757	35	5004
25 to 34 years	240,255	185	1299	151	1591	51	4711	89	2699
35 to 44 years	253,110	210	1205	121	2092	78	3245	64	3955
45 to 54 years	258,840	306	846	206	1257	95	2725	109	2375
55 to 64 years	162,265	242	671	132	1229	91	1783	50	3245
65 to 74 years	91,850	114	806	68	1351	40	2296	63	1458
75+	66,685	65	1026	19	3510	31	2151	13	5130
Total	1,248,145	1254	995	815	1531	412	3029	428	2916
Females									
18 to 24 years	167,360	66	2536	115	1455	21	7970	62	2699
25 to 34 years	234,580	228	1029	263	892	79	2969	178	1318
35 to 44 years	253,020	346	731	215	1177	98	2582	89	2843
45 to 54 years	253,360	424	598	243	1043	127	1995	118	2147
55 to 64 years	160,705	279	576	215	747	128	1256	48	3348
65 to 74 years	97,480	199	490	68	1434	69	1413	62	1572
75+	97,395	129	755	7	13914	47	2072	13	7492
Total	1,263,900	1747	723	1204	1050	592	2135	578	2187
Grand Total	2,512,045	3001		2019		1004		1006	

Unlike many other goods and services purchased by consumers, gambling goods hold the potential to generate positive returns in the form of winnings. The survey question explicitly elicits information about *net* spending. In order to answer this question, individuals must mentally account for both spending and returns and estimate the difference. This requires recalling both winning and losing episodes in past gambling sessions.

Table B.3: Reported Net Spending, Selected Gambling Activities, 2008

Gambling Activity	% Reporting Net Loss	% Reporting Breaking Even	% Reporting Net Gain
Ticket Lottery	86.90	7.20	5.91
VLT	81.60	9.67	8.73
Slot Machines	78.85	10.90	10.26

Table B.3 summarizes the reported net gains and losses for three types of gambling offered in Alberta: ticket lotteries, Video Lottery Terminals (VLTs), and slot machines. Several interesting features appear on Table B.3. First, a significant number of survey respondents report that their net spending on these three types of gambling are zero; that is, between seven and eleven percent of respondents report spending about as much as they win on these three types of gambling activities. Statistically, there is no reason for this much probability mass to be centered on zero in this sample.

Net spending is a continuous random variable, so a net spending of zero is no more or less likely than net spending of -\$1, or any other value. The distribution of the net spending variable suggests that some sort of recall bias or other problem may influence respondents answers to these questions. Second, a statistically significant number of respondents report earning positive net returns from gambling on average. In terms of types of gambling, about 6% of lottery ticket buyers, about 9% of VLT players, and about 10.5% of slot machine players report earning positive net returns on these activities on average.

How does the distribution of reported net gains and losses in the 2008 population survey compare with actual aggregate gambling outcomes on these three types of gambling activities? The 2009 AGLC Annual Report contains information about the actual revenues and prizes awarded in these three types of gambling activities in 2008. Table B.4 summarizes the revenues, prizes, and returns reported for ticket lotteries, VLTs and Slot Machines in Alberta in 2008. Total revenues earned is equal to the total dollars wagered in the province on each type of gambling activity. The net return is the difference between the total prizes paid out and the total dollars wagered. About \$632 million was spent on ticket lotteries in Alberta in 2008. \$327 was paid out in prizes, and \$304 million was retained. While some of this \$304 million was paid to LTC operators, that is not pertinent to this analysis. Based on dollars wagered and dollars paid out as prizes, the average expected return on each dollar wagered on ticket lotteries in Alberta in 2008 was -48%. Put another way, the expected value of each dollar wagered on ticket lotteries was \$0.52. Given this large expected loss, it is unlikely that 6% of those individuals who reported purchasing lottery tickets earned a positive return on these gambles, or that an additional 7% would have broken even. It is equally unlikely that, given the -8.1% expected return on each dollar wagered on slot machines, more than 21% of the slot machine players could break even or earn a positive return on their play.

Table B.4: Actual Revenues, Prizes and Returns, 2008

Gambling Activity	Total Revenues Earned	Total Prizes Paid	Net Return	% Return per Dollar Wagered
Ticket Lottery	\$632,200,000	\$327,400,000	\$304,800,000	-48.2%
VLT	\$8,884,600,000	\$8,178,800,000	\$705,800,000	-7.9%
Slot Machines	\$15,495,400,000	\$14,236,800,000	\$1,231,600,000	-8.1%

A more likely explanation is that the survey respondents were unable to recall the actual outcomes of their ticket lottery wagers. The seven percent of lottery ticket purchasers who reported breaking even probably lost money, but were unable to accurately recall their net spending over the last year. A number of theoretical reasons for mis-reporting new gambling spending have been put forth in the literature. Tversky and Kahneman (1974) describe many potential sources for this type of biased or incorrect recall of uncertain events like the outcome of past wagers. Potential sources include representativeness bias, insensitivity to sample size, biases due to the retrievability

of instances, insufficient adjustment, and anchoring. Thaler (1985) developed a model of mental accounting that clearly predicts consumers will understate losses and overstate wins in this setting.

In any event, soliciting information about net returns makes it impossible to estimate the actual consumer spending on gambling activities in the province. The net win or loss estimate in the survey depends on both the respondents recall of how much was spent, and how much was won or lost. Wood and Williams (2007) conclude that “In general, retrospective estimates of gambling expenditures appear unreliable” (p. 72). While all retrospective estimates may be unreliable, different methods have relatively more or less use when attempting to estimate consumer spending on gambling. Given the distribution of self-reported gains and losses reported on Table B.3, the survey question used here cannot be used to estimate out of pocket consumer spending on gambling in the province. Note that comparing the distribution of reported net returns on Table B.3 and the actual returns on Table B.4 is a difficult task. One approach would be to compare the fraction of the sample reporting positive net returns on Table B.3 with the predicted proportion of the population that could be expected to earn positive returns based on the actual return reported on Table B.4. This comparison requires both the expected return on each type of gambling *and* the variance of the expected return. The variance depends of a variety of factors, including the payoffs for specific outcomes in each type of gambling activity and, in the case of VLTs, strategies employed by the players. Even in the case of slot machines, an estimate of the variance of expected return requires information from the payment and reel strip sheets for each type of slot machine in use in the province. We lack access to this information, and cannot estimate the variance of the expected return on these types of gambling activities.

## Appendix C

# Alberta Lottery Fund Allocation Estimates, '09-'10

Table C.1: Alberta Lottery Fund Allocations, 2009-2010

Item	Millions of Dollars Allocated
Ministry: Aboriginal Relations	
First Nations Relations	0.2
First Nations Development Fund	110.0
	<b>110.2</b>
Ministry: Advanced Education and Technology	
Capital Maintenance and Renewal	65.0
Capital Expansion and Upgrading	40.0
	<b>105.0</b>
Ministry: Agriculture and Rural Development	
Agricultural Service Boards	11.0
Agriculture Societies	9.0
Agriculture Initiatives	1.0
	<b>21.0</b>
Ministry: Children and Youth Services	
Family and Community Support Services	45.0
Prevention of Family Violence and Bullying	6.0
Fetal Alcohol Spectrum Disorder Initiatives	12.0
	<b>63.0</b>

Item	Millions of Dollars Allocated
Ministry: Culture and Community Spirit	
Film and Television Production	20.0
Arts	0.7
Alberta Foundation for the Arts	35.0
Community Facility Enhancement Program	38.0
Community Initiatives Program	28.0
Community Spirit Donation Grant Program	20.0
Major Fairs and Exhibitions	23.0
Other Initiatives	8.0
Horse Racing and Breeding Renewal Program	35.0
Bingo Associations	8.0
Alberta Historical Resources Foundation	9.0
Human Rights, Citizenship and Multiculturalism Education Fund	2.0
	<b>228.0</b>
Ministry: Education	
Public and Separate School Support Operation Funding	61.0
School Facilities Infrastructure	60.0
Basic Education Program Initiative - High Speed Network	8.0
	<b>129.0</b>
Ministry: Employment and Immigration	
Summer Temporary and Other Employment Programs	7.0
Settlement and Integration Services and Enhanced Language Training	4.0
	<b>12.0</b>
Ministry: Environment	
Conservation and Education	0.5
	<b>0.5</b>
Ministry: Health and Wellness	
Human Tissue and Blood Services	125.0
Community-Based Health Services	10.0
Alberta Health Services	257.0



Item	Millions of Dollars Allocated
	<b>392.0</b>
Ministry: Municipal Affairs	
Municipal Sustainability Operating Grants	26.0
	<b>26.0</b>
Ministry: Solicitor General and Public Security	
Gaming Research	2.0
	<b>2.0</b>
Ministry: Tourism, Parks and Recreation	
Recreation and Sports Facilities Grants	9.0
Hosting Major Athletic Events	0.5
Alberta Sport, Recreation, Parks and Wildlife Foundation	25.0
	<b>35.0</b>
Ministry: Transportation	
Provincial Highway Preservation	50.0
Alberta Cities Transportation Partnerships	30.0
Rural Transportation Partnerships	50.0
Streets Improvement Program	25.0
Municipal Water Wastewater Program/Water for Life	100.0
Provincial Highway Rehabilitation	120.0
	<b>375.0</b>
<b>TOTAL FUNDING</b>	<b>\$1,500</b>

*Source: Alberta Lottery Fund, 2010*

## Appendix D

# Technical Appendix: Secondary Panel Data Analysis

In several chapters in this report we performed a regression analysis on secondary data related to gambling and various outcome variables in Alberta. For example, we analyze the relationship between the opening of casinos in the province and historical bankruptcy and insolvency rates in each economic region over the period 1987-2009 in Section 5.4.2 of Chapter 5 beginning on page 77. We also analyze the relationship between the opening of casinos in the province and the introduction of VLTs in bars and taverns and historical crime incidence rates in 78 communities in Alberta for which we have crime incidence data over the period 1977-2008 in Section 9.2 of Chapter 9 beginning on page 165.

In general, this approach uses multiple regression techniques to estimate the conditional correlation between gambling-related explanatory variables and specific outcome variables. This multiple regression approach explains observed variation in outcomes like insolvency and bankruptcy rates across economic regions and over time with observed variation in other factors, including economic factors like the unemployment rate, demographic factors like the population, and variation in gambling-related explanatory variables the number of casinos across economic regions and over time. The multiple regression model controls for unobservable heterogeneity in the economic regions and years in the sample, as well as the effect of confounding factors like the unemployment rate in the economic region and the population of the region. Bear in mind that the regression results reported here are measures of statistical association, and not causal estimates, so they must be interpreted with care.

Both the outcome variables and the gambling-related explanatory variables are observed over time for specific geographic areas in the province. Data with these characteristics are called “panel data” and a number of statistical techniques for analyzing these types of variables have been developed in the past few decades.

## D.1 Panel Data Models

The statistical analysis of panel data is a well-established area of applied research in the social sciences and other disciplines. A number of excellent and approachable treatments of this subject are available. Hsiao (2003) is a standard textbook treatment of panel data estimation methods. The key feature of panel data, sometimes called longitudinal data, is the presence of observations over time across individual units of observation. Panel data sets have characteristics of both cross-sectional data and time series data. Since panel data sets contain both cross sectional and time series characteristics, these data sets can be exploited to control for the effects of unobservable heterogeneity both across the units of observation and over time.

A general panel data model explains observed variation in some dependent variable of interest  $Y_{it}$  that varies both across the  $i = 1, 2, 3, \dots, N$  cross sectional units and over  $t = 1, 2, 3, \dots, T$  time periods

$$Y_{it} = \alpha_i + \alpha_t + \beta G_{it} + \gamma EX_{it} + e_{it} \quad (\text{D.1})$$

using both a vector of explanatory variables that vary over cross sectional units and time,  $EX_{it}$  and a gambling-related explanatory variable,  $G_{it}$  that varies over the cross sectional units and time.  $\alpha_i$ ,  $\alpha_t$ , and  $\gamma$  are vectors of unknown parameters to be estimated.  $\alpha_i$  is a vector of cross-section unit specific intercepts that capture unobservable heterogeneity in the cross sectional units that might affect the outcome variable of interest. This is called a “fixed effect” in the jargon of panel data estimation.  $\alpha_t$  is a vector of time-period specific intercepts that capture unobservable heterogeneity in each period in the sample that affects all cross-sectional units equally. This could include the business cycle in the area, the regulatory environment, the effects of demographic changes, or other time varying effects. Panel data models including both  $\alpha_i$  and  $\alpha_t$  are called “two way fixed effects models” because they control for two types of unobservable heterogeneity. Estimates of  $\alpha_i$  and  $\alpha_t$  are typically treated as “nuisance parameters” in panel data models and estimates of these parameters are not reported, because they represent the net effect of a potentially large number of unobservable factors.  $\beta$  is the key unknown parameter of interest to be estimated, as this parameter captures the relationship between the gaming-related explanatory variable,  $G_{it}$  and the outcome variable,  $Y_{it}$ .

$e_{it}$  is an unobservable equation error term that captures the effects of all other factors, excluding those factors captured by  $\alpha_i$ ,  $\alpha_t$ ,  $G_{it}$  and  $EX_{it}$  that affect the outcome variable of interest. By assumption,  $e_{it}$  is a mean zero independent and identically distributed random variable with constant variance  $\sigma_e$  that is uncorrelated with  $\alpha_i$ ,  $\alpha_t$ ,  $G_{it}$  and  $EX_{it}$ . Under this assumption, Ordinary Least Squares (OLS) applied to Equation (D.1) produces unbiased, efficient and consistent

estimates of the population parameters of interest. OLS applied to Equation (D.1) is sometimes called the “least squares dummy variable” (LSDV) model in the panel data literature.

Rather than compute the usual standard errors for OLS, we use a robust estimation procedure for the standard errors that accounts for possible violations of the assumptions about the equation error term,  $e_{it}$ . This robust standard error estimation procedure accounts for heteroscedasticity in the equation error term. The robust standard errors are computed as follows. Let  $X$  represent a matrix composed of all explanatory variables in Equation (D.1) and  $\hat{e}_{it}$  be the OLS residuals from Equation (D.1). The robust standard errors are based on

$$V_{rob} = (X'X)^{-1} \left[ \sum_{i=1}^N (\hat{e}_i x_i)' (\hat{e}_i x_i) \right] (X'X)^{-1} \quad (\text{D.2})$$

The reported standard errors are the square root of the diagonal elements of this variance-covariance matrix.

## D.2 Complete Results

Again, we analyze the relationship between the opening of casinos in the province and historical bankruptcy and insolvency rates in each economic region in Alberta over the period 1987-2009 in Section 5.4.2 of Chapter 5 beginning on page 77 and the relationship between the opening of casinos in the province and the introduction of VLTs in bars and taverns and historical crime incidence rates in 78 communities in Alberta over the period 1977-2008 in Section 9.2 of Chapter 9 beginning on page 165. The report contains only the estimated parameters on the gambling variables.

## D.3 Communities in the UCR Data

Section 9.2 analyzes crime rates reported at the community level in Alberta in the Uniform Crime Reporting Survey. Table lists the 78 communities in Alberta identified in these data.

Table D.1: Casinos and Crime I - Local Effects

	(1) B&E	(2) Credit Card Fraud	(3) Drugs	(4) Illegal Gambling	(5) Other Fraud
Population	-6.269 (0.264)	-0.0690 (0.855)	-3.111 (0.147)	-0.0590 (0.180)	-2.994 (0.032)
Pop squared	0.00314 (0.322)	-0.00000557 (0.980)	0.00173 (0.156)	0.0000377 (0.160)	0.00187 (0.027)
Unemployment Rate	-207.0 (0.092)	-19.93 (0.000)	6.697 (0.936)	-3.049 (0.020)	-94.82 (0.265)
Casino	24.06 (0.741)	19.28 (0.084)	8.019 (0.767)	0.337 (0.432)	14.21 (0.459)
Time Trend	200.6 (0.090)	21.23 (0.000)	-24.40 (0.760)	2.982 (0.016)	102.3 (0.212)
Constant	1491.8 (0.001)	71.88 (0.001)	345.2 (0.267)	12.69 (0.013)	335.8 (0.267)
Observations	2166	2166	2166	2166	2166
$R^2$	0.643	0.199	0.494	0.096	0.206

*p*-values in parentheses

Table D.2: Casinos and Crime II - Local Effects

	(1) Prostitution	(2) Robbery	(3) Shoplifting < \$5k	(4) Shoplifting > \$5k
Population	0.509 (0.002)	0.176 (0.436)	-0.313 (0.058)	0.00987 (0.996)
Pop squared	-0.0004 (0.005)	-0.0002 (0.229)	0.0002 (0.046)	0.0004 (0.734)
Unemployment Rate	-1.966 (0.000)	-8.014 (0.301)	23.55 (0.091)	24.15 (0.741)
Casino	5.473 (0.078)	9.554 (0.019)	-2.893 (0.105)	-65.63 (0.029)
Time Trend	1.506 (0.002)	7.745 (0.294)	-18.67 (0.159)	-15.90 (0.823)
Constant	2.156 (0.362)	40.92 (0.152)	-82.05 (0.102)	55.32 (0.828)
Observations	2166	2166	2166	2166
$R^2$	0.573	0.676	0.236	0.541

*p*-values in parentheses

Table D.3: Casinos and Crime I - Census Region Effects

	(1) B&E	(2) Credit Card Fraud	(3) Drugs	(4) Illegal Gambling	(5) Other Fraud
Population	0.00361 (0.287)	-0.000307 (0.425)	0.00152 (0.362)	-0.0000180 (0.704)	-0.000885 (0.590)
Pop squared	-2.06e-09 (0.267)	1.58e-10 (0.522)	-8.45e-10 (0.337)	1.37e-11 (0.609)	6.90e-10 (0.457)
Unemployment Rate	-12.97 (0.300)	3.455 (0.113)	-33.71 (0.002)	0.154 (0.240)	7.510 (0.168)
Casino	-105.7 (0.053)	12.24 (0.134)	-37.42 (0.194)	-0.0372 (0.945)	-10.45 (0.666)
Time Trend	-13.88 (0.017)	1.764 (0.003)	-7.284 (0.032)	-0.0841 (0.095)	2.860 (0.009)
Constant	1141.5 (0.000)	4.420 (0.818)	580.6 (0.000)	2.050 (0.331)	130.4 (0.048)
Observations	582	582	582	582	582
$R^2$	0.560	0.339	0.568	0.154	0.412

*p*-values in parentheses

Table D.4: Casinos and Crime II - Census Division Effects

	(1) Prostitution	(2) Robbery	(3) Shoplifting < \$5k	(4) Shoplifting > \$5k
Population	0.000405 (0.053)	0.000514 (0.000)	-0.000130 (0.296)	0.00129 (0.615)
Pop squared	-2.75e-10 (0.061)	-3.20e-10 (0.000)	7.90e-11 (0.278)	-4.98e-10 (0.711)
Unemployment Rate	-0.647 (0.102)	-1.226 (0.206)	3.298 (0.000)	12.59 (0.024)
Casino	6.344 (0.031)	3.478 (0.310)	-2.828 (0.025)	-53.31 (0.147)
Time Trend	-0.331 (0.148)	-0.0176 (0.951)	-0.0977 (0.475)	-6.257 (0.002)
Constant	-12.70 (0.073)	22.42 (0.025)	-6.271 (0.314)	239.0 (0.024)
Observations	582	582	582	582
$R^2$	0.628	0.826	0.361	0.669

*p*-values in parentheses

Table D.5: VLTs and Crime I - Local Effects

	(1) B&E	(2) Credit Card Fraud	(3) Drugs	(4) Illegal Gambling	(5) Other Fraud
Population	-3.818 (0.323)	0.399 (0.392)	-2.563 (0.106)	-0.0493 (0.200)	-2.742 (0.023)
Pop squared	0.00239 (0.321)	-0.000282 (0.314)	0.00151 (0.119)	0.0000332 (0.172)	0.00166 (0.035)
Number of VLTs	-0.253 (0.232)	0.0568 (0.038)	-0.0264 (0.583)	0.000440 (0.650)	0.0662 (0.250)
Unemployment Rate	-318.5 (0.014)	-20.28 (0.000)	-17.60 (0.832)	-2.105 (0.280)	-120.7 (0.062)
Time Trend	307.0 (0.012)	21.41 (0.000)	-1.189 (0.988)	2.065 (0.268)	127.2 (0.041)
Constant	1867.3 (0.000)	67.38 (0.003)	426.5 (0.168)	9.216 (0.201)	424.5 (0.067)
Observations	2143	2143	2143	2143	2143
$R^2$	0.628	0.197	0.492	0.095	0.204

*p*-values in parentheses

Table D.6: VLTs and Crime II - Local Effects

	(1) Prostitution	(2) Robbery	(3) Shoplifting < \$5k	(4) Shoplifting > \$5k
Population	0.856 (0.003)	0.606 (0.005)	-0.309 (0.012)	-1.562 (0.291)
Pop squared	-0.000463 (0.014)	-0.000325 (0.028)	0.000219 (0.007)	0.00124 (0.186)
Number of VLTs	-0.0297 (0.022)	-0.0147 (0.221)	-0.0204 (0.005)	-0.169 (0.001)
Unemployment Rate	-2.457 (0.001)	-10.50 (0.093)	9.318 (0.132)	39.55 (0.603)
Time Trend	1.772 (0.001)	9.924 (0.094)	-4.935 (0.410)	-30.23 (0.683)
Constant	0.579 (0.845)	45.36 (0.054)	-31.05 (0.170)	19.71 (0.941)
Observations	2143	2143	2143	2143
$R^2$	0.589	0.489	0.236	0.538

*p*-values in parentheses

Table D.7: Casinos and Bankruptcy

	(1) Bankruptcy Rate	(2) Insolvency Rate
Population	-0.00466 (0.000)	-0.00485 (0.001)
Unemployment Rate	0.213 (0.027)	0.205 (0.055)
Casino	0.117 (0.055)	0.143 (0.048)
Time Trend	0.167 (0.000)	0.195 (0.000)
Constant	-0.421 (0.619)	-0.277 (0.770)
Observations	184	184
$R^2$	0.881	0.880

*p*-values in parentheses



Table D.8: Alberta Communities in UCR Data

Community	Observations	% Sample	Community	Observations	% Sample
Airdrie	310	1.45	Innisfail	310	1.45
Athabasca	270	1.26	Lac La Biche	280	1.31
Banff	140	0.65	Lacombe	310	1.45
Barrhead	290	1.35	Leduc	310	1.45
Beaumont	140	0.65	Lesser Slave Lake	40	0.19
Blairmore	30	0.14	Lethbridge	310	1.45
Bonnyville	310	1.45	Louis Bull	210	0.98
Brooks	310	1.45	Medicine Hat	310	1.45
Calgary	310	1.45	Morinville	310	1.45
Camrose	310	1.45	Okotoks	310	1.45
Canmore	310	1.45	Olds	310	1.45
Cardston	280	1.31	Peace River	310	1.45
Chestermere	30	0.14	Pincher Creek	280	1.31
Claresholm	280	1.31	Ponoka	310	1.45
Coaldale	270	1.26	Raymond	280	1.31
Cochrane	310	1.45	Red Deer	310	1.45
Cold Lake	310	1.45	Redcliff	160	0.75
Coleman	20	0.09	Redwater	280	1.31
Crowsnest Pass	270	1.26	Rimbey	290	1.35
Devon	310	1.45	Rocky Mt. House	310	1.45
Didsbury	280	1.31	Sherwood Park	310	1.45
Drayton Valley	310	1.45	Slave Lake	310	1.45
Drumheller	310	1.45	Spruce Grove	310	1.45
Edmonton	310	1.45	St. Albert	310	1.45
Edson	310	1.45	St. Paul	310	1.45
Fairview	280	1.31	Stettler	310	1.45
Fort Macleod	280	1.31	Stony Plain	310	1.45
Fort McMurray	310	1.45	Strathmore	310	1.45
Fort Saskatchewan	310	1.45	Swan Hills	280	1.31
Fox Creek	280	1.31	Sylvan Lake	310	1.45
Grande Cache	280	1.31	Taber	310	1.45
Grande Prairie	310	1.45	Three Hills	280	1.31
Grimshaw	280	1.31	Valleyview	270	1.26
Hanna	280	1.31	Vegreville	310	1.45
High Level	280	1.31	Vermilion	280	1.31
High Prairie	280	1.31	Wainwright	310	1.45
High River	310	1.45	Westlock	280	1.31
Hinton	320	1.49	Wetaskiwin	310	1.45
Hobbema	30	0.14	Whitecourt	310	1.45

## Appendix E

# Technical Appendix: Causal Statistical Analysis of Population Survey Data

Several chapters in the report make use of the population survey data collected as part of the SEIGA project to analyze a causal relationship between participation in different types of gambling and specific outcome variables identified in our SEIG framework as important indicators of the socioeconomic impact of gambling. For example, in Section 8.3 of Chapter 8 on page 155 we examine the relationship between participation in different types of gambling and self-reported happiness. These analyses make use of the method of Instrumental Variables (IV) to analyze this causal relationship. This appendix describes the IV estimator used throughout the report.

IV estimators have been widely used in economics to analyze causal relationships in secondary data where random assignment into “treatment” and “control” groups is not possible. Angrist, Imbens and Rubin (1996) contains a good technical discussion of IV estimators. Angrist and Krueger (2001) contains a less technical overview of this approach.

### E.1 Instrumental Variables Estimators

Let  $Y_i$  represent a generic outcome variable from the population surveys described in Appendix B.  $i$  indexes individuals in the sample. Variation in  $Y_i$  can be analyzed in a standard regression model

$$Y_i = \beta_0 + \beta_1 G_i + \gamma E_i + \epsilon_i \tag{E.1}$$

where  $G_i$  is an indicator variable that is equal to 1 if individual  $i$  participates in some type of gambling activity,  $E_i$  is a vector of explanatory variables that capture characteristics of individuals in the sample (age, gender, racial/ethnic background, income, etc),  $\epsilon_i$  is an unobservable equation error term that captures all factors other than  $G_i$  and  $E_i$  that affect the outcome variable, and  $\beta_0$ ,  $\beta_1$  and  $\gamma$  are unknown parameters to be estimated. By assumption  $\epsilon_i$  is an identical and independently distributed random variable with zero mean and constant (unknown) variance  $\sigma_\epsilon$ .  $\beta_1$  reflects the nature of the relationship between gambling participation and the outcome variable and is the primary unknown parameter of interest.

The decision to participate in one or more gambling activities and the outcome variables could be jointly determined. In this case,  $G_i$  will be correlated with the unobservable factors that affect the outcome variable ( $\text{corr}(G_i, \epsilon_i) \neq 0$ ) leading to problems applying standard regression techniques like Ordinary Least Squares (OLS) to estimate the unknown parameters in Equation (E.1). Under this condition, OLS does not generate unbiased, consistent estimates of the unknown parameter  $\beta_1$ . Instrumental variables estimators address this problem. A number of IV estimators exist. The most commonly used is called the two-stage least squares (TSLS) estimator. Two-stage least squares, as the name implies, consists of two equations. The first stage model

$$G_i = \alpha_0 + \alpha_1 V_i + \alpha_2 E_i + \mu_i \tag{E.2}$$

has the gambling indicator variable,  $G_i$  as a dependent variable and explanatory variables  $V_i$  and the vector of explanatory variables  $E_i$  that also appear in Equation E.1.  $\mu_i$  is an unobservable random variable with mean zero and constant (unknown) variance  $\sigma_\mu$  that captures all other factors that affect gambling participation. By assumption,  $\mu_i$  is uncorrelated with  $\epsilon_i$ . The key component of the TSLS IV estimator is  $V_i$ , called an “instrument.”  $V_i$  must explain observed variation in gambling participation and also be uncorrelated with the unobserved factors that affect the outcome variable in the second stage, Equation E.1. The instrument identifies the endogenous variable  $G_i$  and corrects for the endogenous relationship between  $G_i$  and  $\epsilon_i$ . Finding a good instrument is not an easy process, as it requires an observable variable that explains gambling participation but is uncorrelated with unobservable factors in the second stage. We discuss the instrument used to explain gambling participation, distance to the nearest casino, in the next section.

The first stage equation, Equation E.2, contains a limited dependent variable. Angrist and Kreuger (2001) contains a thorough discussion of the issues raised by these dummy endogenous variables. One important point is that TSLS IV estimates with these variables can only provide causal estimates for a specific group: those individuals whose behavior can be manipulated by the instrument. In other words, if individuals were placed in a randomized trial where one group were randomly instructed to gamble and the other group instructed not to gamble, the TSLS IV estimates reflect only the behavior of those who gambled only because they were assigned to the

“treated” gambling group. That means it applies only to individuals in the sample who chose to participate in gambling because of the proximity of their home to a casino. These individuals make up only a part of the “treated” group (people who reported participating in gambling). This effect is called the Local Average Treatment Effect (LATE). If the individuals subject to LATE are representative of the overall sub-population of gamblers in Alberta, then the TSLS IV estimates can be interpreted as causal in the overall population. While we can think of no reason why this should not be the case in our application, this caveat is important.

A second issue associated with the dichotomous dependent variable in Equation (E.2) is the estimator should be used to generate estimates of the unknown parameters. While it would be possible to use maximum likelihood methods like probit or logit models to estimate these unknown parameters, Angrist and Krueger (2001) argue that OLS should be used; they advocate for the use of the linear probability model to estimate the unknown parameters of Equation (E.2). The reason is that the consistency of the second stage estimates does not depend on getting the functional form of the first stage model correct. The linear probability model provides more flexibility, and better second stage estimate properties than probit or logit, which require the model specification to be completely correct. As a result, we estimate the first stage model using OLS.

Once the first stage estimates are in hand, implementing TSLS simply involves calculating fitted values from the first stage, using the parameter estimates  $\hat{\alpha}_0$ ,  $\hat{\alpha}_1$  and  $\hat{\alpha}_2$  in

$$\hat{G}_i = \hat{\alpha}_0 + \hat{\alpha}_1 V_i + \hat{\alpha}_2 E_i \quad (\text{E.3})$$

and substituting  $\hat{G}_i$  for  $G_i$  on the right hand side of Equation E.1

$$Y_i = \beta_0 + \beta_1' \hat{G}_i + \gamma E_i + \epsilon_i. \quad (\text{E.4})$$

The estimated parameter  $\hat{\beta}_1'$  is a consistent estimate of the underlying population parameter of interest, the causal relationship between gambling participation and the outcome variables of interest. Gambling participation must be identified by the instrument in order for this to hold.

## E.2 Identification

We identify gambling participation using a variable that reflects the driving distance between the centroid of the postal code where the individual lives and the nearest casino in Alberta. Angrist and Krueger (2001) point out that a good instrument must come from detailed knowledge of the economic mechanism that determines the regressor of interest, in this case the decision to participate

in gambling, and the institutional setting for this behavior. Clearly, proximity to a casino should affect the choice to play table games and slot machines available in casinos in Alberta because this proximity lowers the overall economic cost of participation. We argue that this can also affect the decision to participate in other forms of gambling, perhaps by reducing the cost of acquiring information about other gambling activities like VLTs or lottery, or by overcoming non-economic inhibitions to gamble, like the perception that gambling is a bad economic decision because of the negative expected return on all gambling activities. Proximity to a casino should not be correlated with the unobservable factors that affect outcome variables like self-reported happiness or financial distress.

One important problem with IV estimates is the “weak instrument” problem. This problem occurs when the instrument does not explain enough of the observed variation in the dummy endogenous variable. A weak instrument leads the IV estimator to be biased, and the bias has been shown to possibly be worse than the bias present if Equation (E.1) were simply estimated using OLS. Staiger and Stock (1997) propose a diagnostic test for weak instruments, the F-statistic from the regression

$$G_i = \alpha_0 + \alpha_1 V_i + \mu_i' \tag{E.5}$$

Staiger and Stock (1997) suggest that an F-statistic above 10 indicates no problem with weak instruments, and F-statistics below 10 suggesting weak instruments, although first stage F-statistics as small as 2 were shown to produce reliable IV results.

Table E.1 contains the first stage F-statistics for Equation (E.5) when  $G_i$  is defined as an indicator for five different types of gambling (lottery tickets, instant win tickets, bingo, VLT play, slot machine play and table games in casinos). All the first stage F-statistics are above 4, and in three cases they are above 10. While the distance instrument may be somewhat weak for the case of bingo and VLT play, it appears to be strong in the other cases. These results suggest that the instrument used, driving distance to the nearest casino, is not weak in this setting, implying that we are able to identify gambling participation in the IV estimates used in the report.

### E.3 Complete Results

The TSLS IV estimator is used to generate estimates of the causal impact of participation in gambling in chapters in the report: the effect of participation in gambling on bankruptcy and financial distress in Section 5.4.3 on page 81 in Chapter 5; the effect of participation in gambling on other types of recreational activities in Section 6.4 on page 110 in Chapter 6; and the effect of

Table E.1: Tests of Instrument Strength

Type of Gambling	F-Statistic
Lottery Ticket Purchase	10.12
Instant Ticket Purchase	12.40
Bingo	4.20
Video Lottery Terminal Play	4.24
Slot Machine Play	10.86
Casino Gambling	8.01

participation in gambling on happiness, health and stress in Section 8.2.1 on page 152 in Chapter 8. The tables in the report contain only marginal effect estimates. The tables below contain the full regression results. These are probit results from Equation (E.4) when the dependent variable is dichotomous and OLS results when the dependent variable takes more than two values.

Table E.2: Gambling and Bankruptcy I

	(1) DV: Bankrupt	(2) DV: Bankrupt	(3) DV: Bankrupt
Predicted Lottery Participation	-0.611 (0.886)		
Predicted Scratch off Participation		2.656 (0.585)	
Predicted Bingo Participation			11.52 (0.457)
Age	0.0380 (0.766)	0.0449 (0.600)	0.0348 (0.656)
Age squared	-0.000400 (0.744)	-0.000416 (0.617)	-0.000414 (0.611)
Male	0.291 (0.609)	0.455 (0.482)	0.685 (0.383)
Married	-0.612 (0.165)	-0.699 (0.146)	-0.622 (0.163)
College Grad	0.137 (0.814)	0.331 (0.570)	0.448 (0.481)
Student	0.438 (0.418)	0.570 (0.329)	0.460 (0.395)
Employed Full Time	-0.261 (0.702)	-0.535 (0.419)	-0.368 (0.488)
Employed Part Time	0.131 (0.807)	0.0550 (0.917)	0.152 (0.774)
Income	0.0163 (0.797)	0.0177 (0.793)	0.0246 (0.695)
Native Canadian	-0.538 (0.505)	-0.954 (0.196)	-0.754 (0.116)
Aboriginal	0.872 (0.120)	0.658 (0.286)	-0.353 (0.833)
Constant	-3.386 (0.085)	-4.458 (0.117)	-4.275 (0.063)
Observations	4460	4460	4460

*p*-values in parentheses

Table E.3: Gambling and Bankruptcy II

	(1) DV: Bankrupt	(2) DV: Bankrupt	(3) DV: Bankrupt
Predicted VLT Participation	21.90 (0.064)		
Predicted Slots Participation		11.14 (0.296)	
Predicted Casino Participation			13.39 (0.439)
Age	0.198 (0.113)	0.0942 (0.117)	0.201 (0.320)
Age squared	-0.00152 (0.158)	-0.00100 (0.103)	-0.00174 (0.278)
Male	0.00132 (0.998)	0.561 (0.142)	-0.579 (0.633)
Married	-0.423 (0.386)	-0.108 (0.668)	0.0625 (0.879)
College Grad	1.161 (0.139)	0.139 (0.773)	-0.260 (0.322)
Student	1.243 (0.083)	0.283 (0.340)	0.0398 (0.936)
Employed Full Time	-1.048 (0.149)	-0.309 (0.516)	-0.0347 (0.915)
Employed Part Time	-0.159 (0.778)	-0.269 (0.489)	-0.285 (0.462)
Income	-0.0153 (0.816)	-0.102 (0.079)	-0.114 (0.095)
Native Canadian	-1.821 (0.030)	-1.247 (0.163)	-0.505 (0.102)
Aboriginal	-0.872 (0.390)	-1.065 (0.392)	-0.0596 (0.900)
Constant	-10.24 (0.020)	-5.431 (0.025)	-7.769 (0.206)
Observations	4460	12496	12496

*p*-values in parentheses



Table E.4: Gambling and Financial Problems I

	(1) DV: Fin. Prob.	(2) DV: Fin. Prob.	(3) DV: Fin. Prob.
Predicted Lottery Participation	1.030 (0.300)		
Predicted Scratch off Participation		-0.0392 (0.967)	
Predicted Bingo Participation			-1.828 (0.568)
Age	0.0275 (0.376)	0.0521 (0.013)	0.0514 (0.010)
Age squared	-0.000324 (0.280)	-0.000552 (0.008)	-0.000538 (0.009)
Male	0.325 (0.041)	0.368 (0.031)	0.307 (0.104)
Married	-0.0796 (0.444)	-0.0864 (0.417)	-0.0835 (0.421)
High School Grad	-0.00391 (0.971)	-0.00175 (0.988)	0.0163 (0.886)
College Grad	-0.0946 (0.515)	-0.169 (0.222)	-0.204 (0.155)
Student	0.0952 (0.590)	0.0725 (0.689)	0.0698 (0.691)
Employed Full Time	0.0448 (0.770)	0.136 (0.329)	0.135 (0.286)
Employed Part Time	-0.0325 (0.823)	-0.00338 (0.981)	-0.0183 (0.899)
Income	-0.0390 (0.147)	-0.0385 (0.152)	-0.0406 (0.134)
Native Canadian	0.0220 (0.922)	0.184 (0.349)	0.195 (0.242)
Aboriginal	0.522 (0.001)	0.574 (0.000)	0.757 (0.034)
Constant	-3.178 (0.000)	-3.327 (0.000)	-3.202 (0.000)
Observations	6997	6997	6997

*p*-values in parentheses

Table E.5: Gambling and Financial Problems II

	(1) DV: Fin. Prob.	(2) DV: Fin. Prob.	(3) DV: Fin. Prob.
Predicted VLT Participation	-1.316 (0.490)		
Predicted Slots Participation		3.836 (0.030)	
Predicted Casino Participation			7.432 (0.175)
Age	0.0429 (0.075)	0.0502 (0.000)	0.116 (0.058)
Age squared	-0.000489 (0.029)	-0.000518 (0.000)	-0.000984 (0.037)
Male	0.396 (0.012)	0.193 (0.023)	-0.391 (0.304)
Married	-0.105 (0.325)	-0.222 (0.001)	-0.105 (0.416)
High School Grad	0.00692 (0.950)	-0.101 (0.200)	-0.0713 (0.354)
College Grad	-0.223 (0.140)	-0.114 (0.269)	-0.247 (0.002)
Student	0.0319 (0.864)	0.150 (0.177)	0.00759 (0.964)
Employed Full Time	0.173 (0.213)	-0.0214 (0.833)	0.0482 (0.606)
Employed Part Time	0.0157 (0.914)	-0.0108 (0.912)	-0.0155 (0.874)
Income	-0.0363 (0.178)	-0.00147 (0.896)	-0.0119 (0.485)
Native Canadian	0.247 (0.197)	-0.227 (0.184)	-0.00583 (0.959)
Aboriginal	0.689 (0.002)	0.191 (0.387)	0.490 (0.000)
Constant	-2.978 (0.000)	-3.630 (0.000)	-5.395 (0.005)
Observations	6997	12496	12496
<i>p</i> -values in parentheses			

Table E.6: Gambling and Recreation I

	(1) DV: New Rec. Act.	(2) DV: New Rec. Act.	(3) DV: New Rec. Act.
Predicted Lottery Participation	0.315 (0.772)		
Predicted Scratch off Participation		-0.525 (0.631)	
Predicted Bingo Participation			1.039 (0.780)
Age	0.00322 (0.924)	0.00691 (0.758)	0.0116 (0.582)
Age squared	-0.0000521 (0.872)	-0.0000985 (0.650)	-0.000133 (0.536)
Male	0.345 (0.062)	0.315 (0.117)	0.396 (0.076)
Married	0.0644 (0.606)	0.0764 (0.551)	0.0600 (0.632)
High School Grad	0.260 (0.053)	0.274 (0.047)	0.249 (0.074)
College Grad	0.0132 (0.940)	-0.0419 (0.808)	0.0117 (0.947)
Student	0.142 (0.460)	0.112 (0.572)	0.138 (0.471)
Employed Full Time	0.182 (0.310)	0.243 (0.144)	0.209 (0.169)
Employed Part Time	0.0881 (0.593)	0.101 (0.533)	0.105 (0.525)
Income	-0.0346 (0.272)	-0.0334 (0.289)	-0.0335 (0.290)
Native Canadian	0.227 (0.397)	0.337 (0.163)	0.267 (0.202)
Aboriginal	0.278 (0.176)	0.329 (0.119)	0.188 (0.663)
Constant	-2.966 (0.000)	-2.788 (0.000)	-3.102 (0.000)
Observations	6997	6997	6997
<i>p</i> -values in parentheses			

Table E.7: Gambling and Recreation II

	(1) DV: New Rec. Act.	(2) DV: New Rec. Act.	(3) DV: New Rec. Act.
Predicted VLT Participation	-1.878 (0.394)		
Predicted Slots Participation		5.619 (0.007)	
Predicted Casino Participation			12.70 (0.017)
Age	-0.00306 (0.908)	0.0209 (0.134)	0.137 (0.020)
Age squared	-0.0000255 (0.915)	-0.000225 (0.108)	-0.00105 (0.019)
Male	0.393 (0.032)	0.354 (0.000)	-0.620 (0.091)
Married	0.0375 (0.770)	-0.106 (0.117)	0.103 (0.419)
High School Grad	0.276 (0.042)	-0.00303 (0.973)	0.0291 (0.735)
College Grad	-0.0914 (0.621)	0.265 (0.021)	0.0718 (0.398)
Student	0.0714 (0.730)	-0.103 (0.407)	-0.358 (0.043)
Employed Full Time	0.266 (0.108)	-0.124 (0.266)	-0.0404 (0.675)
Employed Part Time	0.127 (0.444)	-0.0233 (0.818)	-0.0279 (0.783)
Income	-0.0311 (0.326)	-0.0128 (0.312)	-0.0326 (0.062)
Native Canadian	0.373 (0.113)	-0.396 (0.037)	-0.0833 (0.442)
Aboriginal	0.466 (0.100)	-0.294 (0.266)	0.117 (0.449)
Constant	-2.489 (0.002)	-3.348 (0.000)	-6.552 (0.000)
Observations	6997	12496	12496

*p*-values in parentheses

Table E.8: Gambling and Stress I

	(1) Reported Stress	(2) Reported Stress	(3) Reported Stress
Predicted Lottery Participation	-0.166 (0.660)		
Predicted Scratch off Participation		0.322 (0.407)	
Predicted Bingo Participation			1.626 (0.228)
Age	0.0426 (0.000)	0.0406 (0.000)	0.0392 (0.000)
Age squared	-0.000531 (0.000)	-0.000506 (0.000)	-0.000505 (0.000)
Male	-0.278 (0.000)	-0.262 (0.000)	-0.228 (0.001)
Married	-0.196 (0.000)	-0.205 (0.000)	-0.198 (0.000)
High School Grad	-0.0358 (0.459)	-0.0447 (0.366)	-0.0516 (0.302)
College Grad	0.0340 (0.546)	0.0635 (0.247)	0.0787 (0.170)
Student	0.188 (0.014)	0.208 (0.008)	0.194 (0.011)
Employed Full Time	0.157 (0.009)	0.120 (0.029)	0.140 (0.004)
Employed Part Time	0.0172 (0.759)	0.00722 (0.896)	0.0236 (0.672)
Income	0.0173 (0.018)	0.0173 (0.018)	0.0190 (0.011)
Native Canadian	0.194 (0.018)	0.130 (0.074)	0.152 (0.009)
Aboriginal	-0.110 (0.237)	-0.139 (0.144)	-0.283 (0.086)
Constant	1.970 (0.000)	1.866 (0.000)	1.879 (0.000)
Observations	3868	3868	3868
$R^2$	0.071	0.071	0.071

*p*-values in parentheses

Table E.9: Gambling and Stress II

	(1) Reported Stress	(2) Reported Stress	(3) Reported Stress
Predicted VLT Participation	-0.269 (0.728)		
Age	0.0365 (0.000)	0.0357 (0.000)	-0.0408 (0.061)
Age squared	-0.000480 (0.000)	-0.000481 (0.000)	0.0000861 (0.606)
Male	-0.281 (0.000)	-0.276 (0.000)	0.249 (0.070)
Married	-0.198 (0.000)	-0.177 (0.000)	-0.318 (0.000)
High School Grad	-0.0339 (0.485)	0.0116 (0.737)	0.0248 (0.466)
College Grad	0.0334 (0.582)	0.0264 (0.510)	0.0549 (0.106)
Student	0.183 (0.022)	0.202 (0.000)	0.372 (0.000)
Employed Full Time	0.150 (0.005)	0.162 (0.000)	0.194 (0.000)
Employed Part Time	0.0169 (0.765)	-0.0197 (0.591)	-0.0168 (0.646)
Income	0.0179 (0.016)	0.00823 (0.124)	0.0237 (0.001)
Native Canadian	0.182 (0.009)	0.241 (0.000)	0.231 (0.000)
Aboriginal	-0.0935 (0.419)	-0.00589 (0.948)	-0.00242 (0.973)
Predicted Slots Participation		-1.097 (0.066)	
Predicted Casino Participation			-7.451 (0.000)
Constant	2.076 (0.000)	2.338 (0.000)	4.660 (0.000)
Observations	3868	8212	8212
$R^2$	0.071	0.074	0.076

*p*-values in parentheses

Table E.10: Gambling and Bad Health I

	(1) Reported Bad Health	(2) Reported Bad Health	(3) Reported Bad Health
Predicted Lottery Participation	2.336 (0.017)		
Predicted Scratch off Participation		1.245 (0.172)	
Predicted Bingo Participation			2.558 (0.385)
Age	-0.0173 (0.558)	0.0484 (0.009)	0.0412 (0.018)
Age squared	0.000134 (0.634)	-0.000444 (0.012)	-0.000415 (0.018)
Male	0.0961 (0.464)	0.302 (0.033)	0.296 (0.065)
Married	-0.0962 (0.311)	-0.144 (0.140)	-0.113 (0.228)
High School Grad	-0.0811 (0.422)	-0.112 (0.282)	-0.102 (0.331)
College Grad	-0.0330 (0.798)	-0.121 (0.319)	-0.138 (0.270)
Student	0.334 (0.032)	0.343 (0.032)	0.287 (0.062)
Employed Full Time	-0.197 (0.162)	-0.0677 (0.584)	0.0105 (0.924)
Employed Part Time	-0.0580 (0.654)	-0.0120 (0.925)	0.0243 (0.850)
Income	-0.000621 (0.974)	-0.00278 (0.884)	0.000774 (0.967)
Native Canadian	-0.367 (0.066)	-0.144 (0.381)	-0.0276 (0.835)
Aboriginal	0.285 (0.076)	0.311 (0.060)	0.130 (0.702)
Constant	-2.619 (0.000)	-3.543 (0.000)	-3.207 (0.000)
Observations	6997	6997	6997
<i>p</i> -values in parentheses			

Table E.11: Gambling and Bad Health II

	(1) Reported Bad Health	(2) Reported Bad Health	(3) Reported Bad Health
Predicted VLT Participation	0.853 (0.618)		
Predicted Slots Participation		3.792 (0.026)	
Predicted Casino Participation			6.345 (0.199)
Age	0.0459 (0.031)	0.0555 (0.000)	0.110 (0.047)
Age squared	-0.000437 (0.024)	-0.000564 (0.000)	-0.000941 (0.026)
Male	0.189 (0.128)	0.240 (0.002)	-0.266 (0.436)
Married	-0.0987 (0.306)	-0.213 (0.000)	-0.118 (0.313)
High School Grad	-0.0814 (0.421)	-0.0752 (0.324)	-0.0427 (0.567)
College Grad	-0.154 (0.247)	-0.0141 (0.885)	-0.146 (0.049)
Student	0.311 (0.056)	0.286 (0.005)	0.168 (0.273)
Employed Full Time	-0.0140 (0.907)	-0.223 (0.018)	-0.146 (0.087)
Employed Part Time	-0.00850 (0.947)	-0.0983 (0.264)	-0.104 (0.235)
Income	-0.00305 (0.872)	0.00320 (0.752)	-0.00467 (0.759)
Native Canadian	-0.0488 (0.754)	-0.308 (0.053)	-0.0768 (0.441)
Aboriginal	0.314 (0.150)	-0.00776 (0.971)	0.302 (0.028)
Constant	-3.245 (0.000)	-3.611 (0.000)	-5.010 (0.004)
Observations	6997	12496	12496

*p*-values in parentheses



Table E.12: Gambling and Happiness I

	(1) Reported Happiness	(2) Reported Happiness	(3) Reported Happiness
Predicted Lottery Participation	-0.384 (0.188)		
Predicted Scratch off Participation		-0.561 (0.064)	
Predicted Bingo Participation			-1.975 (0.059)
Age	-0.0313 (0.001)	-0.0446 (0.000)	-0.0418 (0.000)
Age squared	0.000281 (0.001)	0.000392 (0.000)	0.000385 (0.000)
Male	-0.0262 (0.538)	-0.0877 (0.058)	-0.115 (0.035)
Married	0.367 (0.000)	0.385 (0.000)	0.372 (0.000)
High School Grad	-0.0108 (0.774)	0.00400 (0.917)	0.00795 (0.838)
College Grad	0.0270 (0.538)	0.0212 (0.619)	0.0123 (0.783)
Student	-0.0613 (0.300)	-0.0808 (0.183)	-0.0553 (0.347)
Employed Full Time	0.0362 (0.436)	0.0381 (0.373)	0.00167 (0.965)
Employed Part Time	0.000954 (0.982)	-0.00155 (0.971)	-0.0241 (0.577)
Income	0.00628 (0.270)	0.00689 (0.226)	0.00481 (0.405)
Native Canadian	-0.0574 (0.370)	-0.0527 (0.352)	-0.0998 (0.027)
Aboriginal	0.0675 (0.349)	0.0858 (0.243)	0.251 (0.050)
Constant	4.464 (0.000)	4.772 (0.000)	4.685 (0.000)
Observations	3869	3869	3869
$R^2$	0.054	0.054	0.054

*p*-values in parentheses

Table E.13: Gambling and Happiness II

	(1) Reported Happiness	(2) Reported Happiness	(3) Reported Happiness
Predicted VLT Participation	-0.732 (0.225)		
Predicted Slots Participation		0.706 (0.140)	
Predicted Casino Participation			4.223 (0.007)
Age	-0.0461 (0.000)	-0.0293 (0.000)	0.0137 (0.429)
Age squared	0.000406 (0.000)	0.000283 (0.000)	-0.0000354 (0.790)
Male	-0.0322 (0.438)	-0.0618 (0.031)	-0.361 (0.001)
Married	0.359 (0.000)	0.353 (0.000)	0.432 (0.000)
High School Grad	-0.00565 (0.881)	-0.0161 (0.558)	-0.0222 (0.410)
College Grad	0.0208 (0.659)	0.0736 (0.021)	0.0543 (0.043)
Student	-0.0757 (0.220)	0.0270 (0.486)	-0.0682 (0.206)
Employed Full Time	0.0226 (0.589)	0.00330 (0.915)	-0.0116 (0.695)
Employed Part Time	0.00215 (0.961)	0.0433 (0.137)	0.0417 (0.153)
Income	0.00797 (0.169)	0.00854 (0.036)	-0.0000828 (0.988)
Native Canadian	-0.0808 (0.134)	-0.112 (0.018)	-0.0993 (0.002)
Aboriginal	0.116 (0.194)	-0.0181 (0.802)	-0.0109 (0.848)
Constant	4.741 (0.000)	3.977 (0.000)	2.678 (0.000)
Observations	3869	8223	8223
$R^2$	0.054	0.046	0.046

*p*-values in parentheses

## Appendix F

# Technical Appendix: Travel Cost Model Estimation

Section 6.2 of Chapter 6 contains estimates of the consumer surplus generated by visits to casinos in Alberta. These estimates are based on the travel cost model. In this chapter, we provide details of the travel cost model methodology and data and empirical method used to generate this estimate of consumer surplus.

### F.1 Travel Cost Models

The travel cost model demand-based model of the use of entertainment facilities that generates estimates of the value of non-monetary benefits associated with recreation-related amenities. It is widely used in economics and related fields. The travel cost model can be used to value the non-monetary benefits generated by casinos. Other applications of the travel cost model include estimation of the use value of entertainment-related amenities like hiking trails and parks. Parsons (2003) contains an excellent summary of the use of travel cost models to generate estimates of consumer surplus generated by entertainment-related sites.

We use a single site travel cost model to generate estimates of the consumer surplus generated by casinos in Alberta. Single site travel cost models are analogous to conventional economic demand models where the quantity demanded is the number of trips to a site and the “price” is the cost of traveling to the site. Visitors travel different distances to visit casinos, generating variation in the price. If the number of trips to a casino declines as distance increases, then the demand curve for casino visits slopes down, and positive consumer surplus is generated when the price is less than

willingness to pay for trips to a casino. Estimates of the demand curve define the willingness to pay for casino visits holding other characteristics constant.

Our goal is to estimate the total use value, sometimes called the access value, of a casino, using a single site travel cost model. Again, this is a model of demand for visits to casinos where the price of the visit is the cost of reaching the site. The amount of money won or lost in the casino can be interpreted as an entrance fee that could be positive or negative, but we abstract from that part of the decision and focus on the entertainment value of the casino. A simple single site travel cost model can be expressed as

$$r = f(tc_r) \tag{F.1}$$

where  $r$  number of casino visits taken in some period and  $tc_r$  is the travel cost incurred reaching the casino. This is a demand function, and the expectation is that the quantity of visits to casinos demanded will fall as the price increases. People living close to casinos face a lower cost of traveling to casinos and would be expected to make more trips to a casino, other things constant. Demand also depends on other factors like age, income, and preferences. These other factors shift the demand function, and the expanded demand function can be written

$$r = f(tc_r; I, z) \tag{F.2}$$

where  $I$  is income, a demand shifter, and  $z$  a vector of demographic characteristics that also shift demand for visits to casinos. Many travel cost models include a price of visits to other entertainment-related sites that can substitute for casino visits. In this analysis, we abstract from the price of substitutes. Implicitly, we assume that casino visits have no close substitutes. If the price of substitute entertainment activities is systematically related to the cost of traveling to casinos, then our consumer surplus estimates will be biased because of this assumption. We see no reason why such a systematic relationship would exist, given the limited number of casinos present in most areas.

The consumer surplus or access value is simply the area under the demand curve between the actual price of visiting a casino faced by each consumer ( $tc_r^0$ ) and the price at which demand for casino trips is equal to zero for each consumer ( $tc_r^c$ ), which is called the “choke price” in this literature because it is the price where demand is “choked off” or stopped. Based on the demand model above, Equation (F.2), the consumer surplus from a casino visit is

$$\Delta w = \int_{tc_r^0}^{tc_r^c} f(tc_r; I, z) dtc_r. \tag{F.3}$$

This integral simply represents the area under the demand function  $f(\cdot)$  between two specific prices.

Empirical travel cost models are simply linear approximations to Equation (F.2)

$$r = \beta_{tc}tc_r + \beta_I I + \beta_z z + e \quad (\text{F.4})$$

where  $\beta_{tc}$ ,  $\beta_I$  and  $\beta_z$  are unknown parameters and  $e$  is an equation error term that captures other factors that affect demand for casino visits.  $\beta_{tc}$  is the slope of the demand curve, and an estimate of  $\beta_{tc}$  can be used to generate estimates of consumer surplus from visits to casinos. We estimate the unknown parameters of Equation (F.4) using casino visitation data from the Travel Survey of Residents of Canada (TSRC).

## F.2 Empirical Approach

The basic approach is to regress casino visits on a measure of the cost of traveling to the casino, the distance to the casino, and other factors that shift demand for casino visits. We define the site to be valued as a representative casino in Canada, that offers gamblers a standard package of casino-related amenities like table games, slot machines, food and drink, and other goods and services. The entertainment use is the value that gamblers get from visiting the casino - the experience of walking around the casino, participating in various gambling activities, eating a meal, having a drink, and other activities inside the casino.

We use data from the TSRC. This survey is designed to contact a representative sample of Canadians and ask detailed questions about their recent travel. The TSRC contains comprehensive high frequency data on travel and was developed specifically to quantify the economic impact of domestic travel in Canada. The TSRC contains information on the number of people traveling on each trip, the duration, origin and destination of the trip, and expenditure made while on the trip. Detailed expenditure data exist for a number of different expenditure categories. The TSRC data collected on expenditures is broken down into a number of categories, including accommodation, restaurants, recreation and entertainment, among several others - a total of 12 categories altogether. These categories are broad, and can include many different types of spending. For instance, the entertainment spending classification includes spending on admission to theatres, art galleries, and sporting events, as well as gambling expenditures. The TSRC collects data at the monthly frequency on trips that ended during the previous month. The survey typically contains six to ten thousand observations per month. We focus on data from the 2007 and 2008 surveys.

We use data on single day trips where the main activity identified in the TSRC as “visiting a casino.” We focus on single day trips to avoid problems measuring travel costs on multiple-day

trips involving multiple activities. This also implicitly defines the market as all people living within a days drive (there and back) of a casino. Instead of modeling the decision to visit a casino, we correct for potential selectivity by using the population weights generated for the TSRC to make sure that the results are representative of the Canadian population.

Our empirical model contains variables reflecting the number of travelers in the party, income, the level of education of the the traveler surveyed, the gender of the traveler surveyed, the employment status of the traveler surveyed, and the age of the traveler surveyed, as well as the cost of traveling to the casino. Since the data are based on single day trips to casinos all over Canada, we also include a vector of indicators variables for province of destination These variables control for province-specific factors that affect demand for visits to casinos. Parsons (2003) identifies these variables as commonly used demand shifters in estimating travel cost models.

We measure travel cost based on data contained in the TSRC. The TSRC contains detailed information on travel costs. Total travel cost is defined as the sum of reported expenditures on vehicle rental, vehicle operation, local transportation, and commercial transportation. Time costs have been identified as important components of travel costs, since time has important opportunity costs. The indicator variable for employment should control for differences in time costs in the model, since employed people have higher time costs than people who do not work. Ideally, data on wages and occupation should be used to control for variation in time costs associated with travel. Since the TSRC does not contain data on wages, the employment indicator and the income variables will be used to control for time costs.

### F.3 Method and Results

We estimate the unknown parameters in Equation (F.4) using data from the TSRC. We pool data from the 2007 and 2008 surveys, and deflate all monetary variables to to 2008 dollars using the Consumer Price Index. Restricting the sample to single day trips where a casino visit was the main activity provides 568 observations. The TSRC contains information about the number of identical trips taken in the previous month. We use this variable to calculate the number of casino visits taken by each individual in the sample. Table F.1 shows the distribution of the number of casino visits. Most people report a single casino visit in the previous mothn, more than 20% of the sample reported multiple trips.

Given this distribution of the dependent variable, Equation (F.4) should be treated as a count data model. According to Parsons (2003), most single site travel cost models are estimated using count data methods. We estimate the unknown parameters of Equation (F.4) using a Poisson regression, the standard count data estimator. The Poisson method assumes that the observed

Table F.1: Number of Casino Visits in Previous Month

Number of Casino Visits Reported	Frequency
1	448
2	37
3	43
4	25
5	8
6	2
7	1
8	1
9	2
12	1
Total	568

number of visits to a casino in a give month is generated by a Poisson process, where the probability of observing an individual making  $r$  visits to a casino is

$$Pr(r) = \frac{e^{-\lambda} \lambda^r}{r!}. \quad (\text{F.5})$$

$\lambda$  is the expected number of trips taken and, by assumption, is a function of the variables in the demand function, Equation (F.2). The regression model estimated is

$$\lambda = \beta_{tc} tc_r + \beta_I I + \beta_z z + e \quad (\text{F.6})$$

There is some debate in the literature about whether or not  $\lambda$  should be log-transformed, making the the regression model a semi-log form. We do not log-transform the dependent variable. However, the results reported here are robust to a log-transformation of the dependent variable, as the estimated use value of casinos changes very little when we log-transform the number of visits. The Poisson process and the demand function can be used to construct a model for the probability that an individual is observed making  $r$  visits to a casino conditional on the demand function arguments, and the likelihood of observing the specific patter of visits in the data, which is the product of the probabilities of observing each. This likelihood function is

$$L = \prod_{n=1}^N \frac{e^{-\lambda_n} \lambda_n^{r_n}}{(r_n - 1)!}. \quad (\text{F.7})$$

Table F.2: Travel Cost Model Estimates

	Dependent Variable: Trips to Casino
Travel Cost to Casino	-0.006 (0.041)
Distance to Casino	0.0002 (0.442)
Number in Party	-0.0759 (0.563)
Male	0.253 (0.103)
Income \$50,000 to \$74,999	-0.150 (0.305)
Income \$75,000 to \$100,000	-0.202 (0.204)
Income over \$100,000	-0.235 (0.117)
High School Graduate	-0.204 (0.404)
College Education	-0.233 (0.189)
Employed	-0.0436 (0.720)
Age 25-34	-0.694 (0.013)
Age 35-44	-0.407 (0.113)
Age 45-54	-0.135 (0.624)
Age 55-65	-0.285 (0.260)
Age over 65	-0.0440 (0.852)
Constant	1.209 (0.000)
Number of Observations	568
<i>p</i> -values in parentheses	



Individuals in the sample are identified by  $i = 1, 2, 3, \dots, N$ .  $r_n$  is the number of casino visits made by person  $n$ . This function can be estimated via maximum likelihood. Table F.2 shows the parameter estimates and  $p$ -values from Equation (F.6).

The travel cost parameter is precisely estimated, and indicates a downward sloping demand function for casino visits.. Many of the other parameters are not statistically different from zero. Once the expected number of trips for each individual  $\hat{\lambda}_n$  and the slope of the demand function  $\hat{\beta}_{tc}$  are found by estimating Equation (F.6), the consumer surplus for each individual can be calculated by

$$\hat{S}_n = \frac{\hat{\lambda}_n}{-\hat{\beta}_{tc}}. \quad (\text{F.8})$$

and the mean access value in the sample is simply

$$\bar{S}_n = \frac{\sum_{i=1}^N \hat{S}_n}{N}. \quad (\text{F.9})$$

This value is 380 for this sample. On average, each visit to a casino generated \$380 in use value or consumer surplus, based on the 580 casino visits in Canada in the 2007 and 2008 TSRC. We assume that the average consumer surplus generated by casino visits in Canada can be applied to casino visits in Alberta.