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Who Supports Free Trade in Latin America?

By

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The undersigned certify that they have read, and recommend to the faculty of Graduate Studies for acceptance, a thesis entitled "Who Supports Free Trade in Latin America?" submitted by Wei Guo Wang in partial fulfillment of the requirement for the degree of Master of Arts.

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ABSTRACT

In developing countries, wage inequality between skilled and unskilled workers will decrease based on the neoclassical trade theory (Heckscher-Ohlin-Samuelson (HOS) framework), but may also increase according to new trade theory (Human Capital model and Intra-Industry Trade (IIT)) under trade liberalization. This thesis examines individual trade policy preferences across 17 countries in Latin America. The focus of this thesis is on skilled versus unskilled workers' trade preferences. My empirical results suggest that on average skilled workers are more likely than unskilled workers to support free trade. Country-separate regressions reveal that this pattern is observed in 10 out of 17 Latin American countries. People from countries of higher GDP per capita, higher FDI, and higher unemployment are more likely to support free trade. This thesis also finds that individual preference regarding regional trade may be different from general trade.

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DEDICATION

To My Wife Chun Xia Li

and my two sons James Wang and Jesse Wang

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE: INTRODUCTON

The Free Trade Area of the Americas (FTAA) Treaty seeks to bind the 34 democracies in the Western hemisphere (including the US) to a single trade agreement. The FTAA Treaty, which will govern the lives of 800 million Americans in the Western hemisphere, would remove trade tariffs and quotas from imports and exports to allow a free flow of goods, capital and services in the Americas, except for Cuba. The agreement is scheduled to be completed by 2005, a self-imposed deadline. At the end of the 2003 Miami FTAA Ministerial summit, U.S. Trade Representative, Robert B. Zoellick, confirmed that the draft treaty still contained more than 5,000 disputed clauses. In the FTAA context, there still remains major disagreement as to what degree the FTAA should bind countries to comply with a uniform set of investment, services, intellectual property, and procurement policies. Canada, Mexico, and Chile are FTAA proponents, while Brazil, the largest economy in South America, is a major opponent. Venezuela and Brazil have been the two countries in the Americas that are most critical of the FTAA process. Although in a similar situation as Mexico, Chile is a stronger supporter of the FTAA process because it has more to gain than Mexico and it does not participate in the Brazil/Mexico rivalry for regional leadership.

Currently, there is strong support for uniting the Americas through FTAA. However, there are also many opponents to this integration (from survey results, each country has opponents, about 10% to 36% people against free trade across countries, see Table2A). One reason for this could be income inequality. Due to NAFTA effects for 10 years, let us look at Mexico's experience, which is the closest country south of the US and a member of NAFTA. Mexico joined the General Agreement on Tariffs and Trade (GATT) in 1986 and NAFTA in

1994. With trade liberalization, between 1987 and 1995, the trade % of GDP rose from 30% to 50%. However, wage inequality between skilled and unskilled workers also began to rise although it was seemingly contrary to the predictions of the Heckscher-Ohlin-Samuelson (HOS) framework (Robertson 2000). After some sort of FTAA deal in Latin America, which groups of individuals in particular countries are more likely to support free trade? Which country's people in Latin America would be more likely to support free trade?

According to Das (2002), wage inequality has increased in Mexico and Chile but decreased in the Philippines, Singapore and Taiwan. Robbins (1996) found that wage gaps grew in Chile, Columbia, Costa Rica and Argentina, but fell in Malaysia and the Philippines. Zhu and Trefler (2001) examined evidence from Gini coefficients of 29 developing and newly industrialized countries and found that wage gaps increased in 16 countries, decreased in 12 countries, and no change in one country. Wage inequality has increased in some, but not in all the developing countries. While the FTAA talks discuss very little about the implications of free trade for wage inequality, the 1998-1999 report of the Inter-American Development Bank, dedicated to analyzing income inequality, argued that it remained 'one of the greatest socioeconomic ills' facing Latin America today (Robertson 2000).

The two most widely cited causes of this labor market phenomenon are trade liberalization and skill-biased technological change. However, the HOS framework suggests that trade could not be the driving force behind increased wage inequality in both developed and developing countries. According to this theorem, wage inequality would increase in the relatively skill-abundant (developed) countries and decline in the relatively skill-scarce

(developing) countries. Skill-biased technological change may be the culprit, but it requires an explanation for why wage inequality is increasing in some, but not in all developing countries.

Recent research on trade and wages has revealed that trade liberalization focusing on sectors dominated by intra-industry trade (IIT) can lead to increased wage inequality in both high-skilled and low-skilled countries. Skilled workers are expected to support free trade more than unskilled workers when their country is actively engaged in intra-industry trade and trade policy is liberalized in those sectors (Beaulieu et al 2004a). Within these models, it is also possible that wage inequality may increase in some-but not all-low skilled countries.

There is a debate in the empirical literatures about trade policy preferences across countries. Two recent papers by Beaulieu et al (2004b) and Mayda and Rodrik (2001) examined trade policy preferences across 24 transitional economies. The poorest country in the sample was the Philippines. Both papers found that skilled workers in most countries were more supportive of trade liberalization than unskilled workers. However, one notable exception was the Philippines, where unskilled workers were more supportive of trade liberalization than skilled workers. Both papers pooled the data and examined whether country characteristics had important interaction effects on the different preferences of skilled and unskilled workers. The results were somewhat mixed. The interaction effects between the individual skill measures and the country skill endowment showed that the difference in preferences between skilled and unskilled was greater in higher skilled countries. However, the country interaction did not overturn the result that skilled workers

were more supportive of free trade than unskilled workers. Mayda and Rodrik (2001) interpreted these results as being consistent with the Stolper-Samuelson theorem of the HOS framework. Beaulieu et al (2004b) argued that these results were inconsistent with the Stolper-Samuelson theorem. Moreover, Beaulieu et al (2004b) found that IIT trade had important interaction effects on individual trade preferences consistent with a trade model where IIT affected the impact of trade on wages. The main hurdle in resolving this debate is that the countries included in the two papers is limited in the coverage of developing countries. Therefore, a more careful empirical analysis of developing country data would shed, and perhaps settle the debate over IIT and support for free trade.

The primary motivation for this thesis is to address the Mayda and Rodrik (2001) versus Beaulieu et al (2004b) debate by looking at other countries including very poor countries. The second is to look at what determines individual's as well as country's positions on trade policy (like Mayda and Rodrik 2001, O'Rourke and Sinnott 2001, and Baker 2004). The third is to look at Latin America, which is interesting and timely, given that the debate over the text of the FTAA Treaty will conclude by January 2005 and the treaty is due to take effect by December 2005. Finally, this thesis examines individual trade preferences regarding general trade liberalization versus regional trade.

In this thesis, the evidence provided is exclusively from developing countries and extends the empirical analysis to examine individual level trade preferences from 17 Latin America countries. I empirically examine why some individuals are more protectionists and which country's people are more protectionists using data from the 1996 Latinobarometro survey.

The purpose of this thesis is to examine the political-economic determinants of supporting trade liberalization for individuals living in Latin American countries.

The unit of analysis in this paper is the individual. I employ a binary response probit model in my analysis of trade preferences, where the dependent variable is a binary choice that can take on the value of one (general free trade helps a nation's economy) and zero (general free trade harms a nation's economy) representing the individual trade preferences. The independent variables are individual skill levels (education levels), country characteristics (GDP per capita, degree of IIT, fraction of import and export high-tech commodities to total trade, and education index etc.), and some fixed individual status variables (age, sex, marital status, family primary wage earner) other than skill level. The marginal effects of individual education levels on individual trade preferences mean that skilled workers are supportive of free trade when the coefficient is positive and statistically significant. Conversely, skilled workers oppose free trade when the coefficient is negative and statistically significant.

The contributions of my thesis can be summarized as follows:

- On average, skilled workers in Latin America are more likely than unskilled workers to support trade. This pattern is observed in 10 out of 17 Latin American countries.

- The IIT model developed by Beaulieu et al (2004a) suggested that country characteristics were important. In particular, they found that the difference in support for trade liberalization between skilled and unskilled workers was greater in countries

that were more engaged in IIT trade. However, this is not the case in my study when I don't consider the endogeneity problem. Interestingly, after correcting for the endogenous, education level variable, the degree of IIT has negative interaction effects on the relationship between individual skill and trade preferences. Moreover, I find people from countries of higher GDP per capita, higher FDI, and higher unemployment are more likely to support free trade.

- This thesis is the first to address two important questions:
    1. Do you think that trade with other countries, both the buying and selling of products, helps [nation's] economy or harms [nation's] economy?
    2. Will your [nation] benefits from its future links with [regional trading block]?

  The survey results and separate country regression results are different between general and regional trade, but the pooled data regression results are consistent with each other. The effect of some determinants of country characteristics on individual preferences are the same in the both questions.

- This thesis is the first to test endogenous problem for key variable individual education level and correct this problem by using instrument variable.

The remainder of the thesis is organized as follows.

Chapter Two provides the background of this thesis, i.e. overview of the countries/ regions, literature review, international trade theories, and some empirical studies on trade preferences and wage inequality, which include Andy baker (2004), Beaulieu et al (2004a,b), Goldberg and Pavcnik (2003), Mayda and Rodrik (2001), Robbins (1996), and other empirical results.

Chapter Three describes the empirical approach and models, data sets and regression results, econometric problem and robustness, specification, and diagnostics.

Chapter Four contains the conclusion, followed by regression results. Table A series are results of general trade regression, table B series are results of regional trade regression, table C series are results about endogenous problem correction for key variable-individual education level in general trade regression. The last one is the Bibliography.

CHAPTER TWO: BACKGROUND

2.1 OVERVIEW OF THE COUNTRIES/REGIONS

It is well known that Latin America is the region with the most unequal income distribution in the world. Although poverty may not be as widespread as in Africa, the gap between the rich and the poor is wider. More than two thirds of hemispheric countries are small economies. The 1996 Latinobarometro survey measured trade attitudes in Latin American countries, which consists of 17 countries in the South America (Argentina, Bolivia, Brazil, Colombia, Chile, Ecuador, Paraguay, Peru, Uruguay, and Venezuela), Central America (Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama), and North America (Mexico), ranging in GDP per capita (at PPP) from US$2150 of Bolivia to US$11,010 of Argentina in 1996 (see Table 2A). Bolivia was the poorest country and Argentina was the richest country in that year. There were 5 countries in the sample below the worldwide median per capita income (US$4000), which is based on the 166 countries for which data are available (World Bank 2000). There were 11 countries below the worldwide mean (US$7000), and 16 countries below US$10,000. Only Argentina was higher than US$10,000. These Latin American countries are developing countries. They are on the way of economic transition to market integration and have taken steps to overcome their political, economic, and geographic isolation. Their major trading partners are USA and Latin American countries and most of Latin American countries speak the same language (Spanish or Portuguese). They are generally rich in natural resources and tend to have a trade deficit in high-tech commodities.

However, Latin American countries are also very heterogeneous group of countries.

Southern American economies are less dependent on the US market. The pattern of intra-regional trade in Southern American is denser. Brazil is a continental economy with a dense domestic market. Brazil's exports accounts for less than 10% of its GDP. Chile is generally regarded as a classical case free trader. Chile's exports are reaching 30% of its GDP. Argentina is still struggling with the ravages of a recession from 1998, debt default and the collapse of the currency (Tussie 2002).

Central American economies show a heavy reliance on the US market as a destination for exports. With the exception of Costa Rica (the biggest economy in Central American), which after the establishment of Intel has been able to shift from traditional exports such as bananas and coffee, to computer chips. The isthmus economies are mostly dependent on traditional exports (sugar, bananas, coffee, fisheries, etc.) and off-shore processed goods.

Caribbean countries are heavily dependent on US trade; yet at the same time they have strong reliance on tariffs as a source of revenues. Tourism and related transportation services are important sources of foreign investment attraction.

Latin America is often assumed to be abundant in less-skilled workers. However, the introduction of China (GDP per capita around US$1000) and other low wage countries into the world trading system raises the possibility that some Latin American countries are not abundant in less-skilled workers as commonly assumed.

Today the picture seems to have changed radically. The global financial crisis that has spread through the second half of the 1990s had a serious impact in the region, leading to not only economic downturn, but also political backlash. Discontent is high and unrest simmers in many areas. Old and new forms of political violence and social disruption may still undermine democratic stability. Ever since the Miami Summit, Venezuela, Argentina, Ecuador, Peru and Paraguay have been in throes of deep political crisis. The outlook for Colombia's domestic strife has worsened in the last five years.

The first tangible indicator of financial crisis was the decline in the massive inflow of Gross Foreign Direct Investment (FDI) that had swept into the region during the past decade. With the exception of Mexico, the trend marked all the regions reflecting the change in the mood of investors in regards to emerging markets in general and Latin American Countries (LAC) in particular. The financial crisis, either regional or extra-regional, resulted in financial contagion[1] and recession. Even in countries that had continued to grow, albeit at significantly lower levels, unemployment remained high. Trade is highly vulnerable to shifts and crisis in exchange rates, foreign investment and capital flows. Financial crisis not only spread quickly across the region, severely affected trade flows, but also stimulated new versions of beggar-thy neighbour behaviour (Tussie 2002).

[1] Helleiner (1999) identifies at least three different sources of financial and economic contagion: 1) direct link between financial institutions: that is when institutions have to sell assets in one country forced by margin calls and liquidity pressures in another; 2) psychological effects: that is the herd-like behavior that characterizes financial markets with limited information –a typical prisoner's dilemma; 3) contagion through direct trade links: that is, when one country enters into recession and affects the imports form another country due to reduction in the aggregate demand.

2.2 LITERATURE REVIEW AND TRADE THEORY

The Heckscher-Ohlin and Stolper-Samuelson theory (HOS framework) explains why some individuals are more protective than others. The Heckscher-Ohlin theorem demonstrates the possibility that the pattern of comparative advantage and international trade is determined in part by national differences in relative factor endowments. It is evident that trade must influence the price of productive factors. The Stolper-Samuelson theorem states, "If there are constant returns to scale and if both goods continue to be produced, a relative increase in the price of a commodity will increase the real return to the factor used intensively in that industry and reduce the real return to the other factor" (Markusen et al 1995 p116).

The Stolper –Samuelson theorem in the HOS framework, which relates changes in commodity prices to changes in real factor prices, provides a fundamental prediction about the effects of trade (or impediments to trade) on the distribution of real incomes between the factors of production. It follows that the relatively abundant factor gains real income and the scarce factor loses real income in each country under free trade.

According to the standard approach of HOS framework, wage inequality will decrease in developing countries under trade liberalization. The wages of skilled workers who are employed intensively in making high-tech commodities will fall whereas the wages of unskilled workers who are employed intensively in making traditional commodities will rise.

Therefore, in skill-scarce countries, the skilled workers should be more likely to oppose free trade than unskilled workers.

The standard neoclassical trade theory can be summarized in a simple 2x2x2 model.[2] Suppose factor i=1 is skilled labor, i=2 is unskilled labor, good j=1 is high-tech and good j=2 is traditional. W_i is the wage for labor i, a_{ij} is the amount of factor i used in producing one unit of good j. The high-tech good is assumed to be skill-intensive and the traditional good is assumed to be unskilled-intensive. Then $\alpha_{11}/\alpha_{21}-\alpha_{12}/\alpha_{22} > 0$ exists at all factor prices. Using cost minimization subject to production requirements:

Min $\{\alpha_{1j}, \alpha_{2j}\}$ $c_j=w_1\alpha_{1j}+w_2\alpha_{2j}$ s.t. $f(\alpha_{1j},\alpha_{2j})=1$.

From the first order conditions, we get $\alpha_{1j}=\alpha_{1j}(w_2/w_1)$, $\alpha_{2j}=\alpha_{2j}(w_2/w_1)$, and $MRTS^j_{21}= w_2/w_1$, such that we get the optimum unit cost function (set quantity q=1)

$Cj=Cj(w_2/w_1)= w_1\alpha_{1j}(w_2/w_1)+w_2\alpha_{2j}(w_2/w_1)$ and with perfect competition zero profit $Pj=Cj$.

Suppose country k has a protection policy for traditional goods (i.e. an export subsidy or import tariff). Totally differentiate with respect to P_1, P_2, W_1 and W_2:

$$\begin{bmatrix} \alpha_{11} & \alpha_{12} \\ \alpha_{21} & \alpha_{22} \end{bmatrix} \begin{bmatrix} dW_1 \\ dW_2 \end{bmatrix} = \begin{bmatrix} 1 \\ 0 \end{bmatrix} dP_1 + \begin{bmatrix} 0 \\ 1 \end{bmatrix} dP_2$$

The determinant $\Delta=\alpha_{11}\alpha_{22}-\alpha_{21}\alpha_{12}=\alpha_{21}\alpha_{12}(\alpha_{11}/\alpha_{21}-\alpha_{12}/\alpha_{22})>0$

Determine the Stolper-Samuelson derivatives by using Cramer's rule:

$dW_1/dP_1 = \alpha_{22}/\Delta > 0$ thus, W_1 and P_1 move in the same direction.

$dW_2/dP_1 = -\alpha_{21}/\Delta < 0$ thus, W_2 and P_1 move in opposite direction.

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[2] The following mathematics and diagram source come from Mussa(1979)

Using the same procedure, totally differentiate with respect to P_2, W_1 and W_2:

$d W_1 / dP_2 = -\alpha_{12} / \Delta < 0$ thus, W_1 and P_2 move in opposite directions.

$d W_2 / dP_2 = \alpha_{11} / \Delta > 0$ thus, W_2 and P_2 move in the same directions.

Determine the Stolper-Samuelson elasticity:

$$\varepsilon = P_1 / W1 * dW_1 / dP_1 = (W_1\alpha_{11} + W_2\alpha_{21})\, \alpha_{22} / (\alpha_{11}\alpha_{22} - {}_{21}\alpha_{12})\, w_1 > 1$$

If P_1 rises, W_1 rises by a great proportion with respect to price P_1.

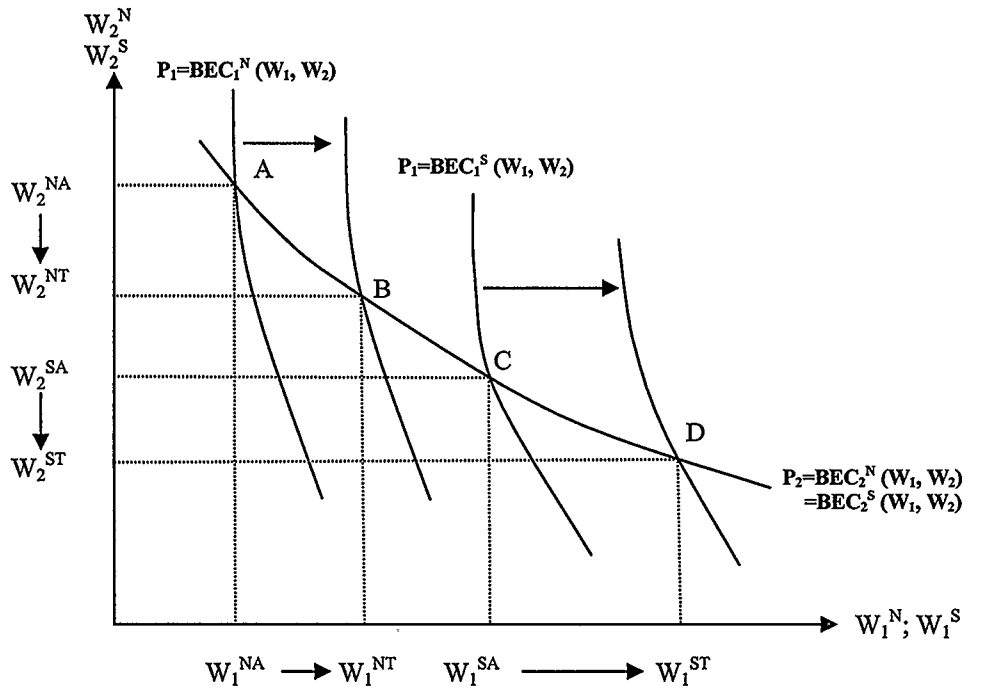
Factor-Price magnification: If P_1 rises $dW_1 / W_1 > dP_1 / P_1 > dP_2 / P_2 > dW_2 / W_2$

Real factor earnings: If P_1 rises, $d(W_1 / P_2) > d(W_1 / P_1) > 0$ and $0 > d(W_2 / P_2) > d(W_2 / P_1)$

According to the above analysis, assuming Latin American countries are unskilled-intensive and export traditional goods, P_2 will rise through market extension. Because W_2 and P_2 move in the same direction but W_1 doesn't, the gains from freer trade tend to favor unskilled relative to skilled workers.

Graph 1 is used to explain pure conventional intra industry trade model. Suppose North and South countries have same technology and trade barrier, industry 1 produces high tech good and industry 2 produces traditional goods. Normalize industry 2, then unit-cost function $P_2 = BEC_2^N(W_1, W_2) = BEC_2^S(W_1, W_2)$. I begin with an initial factor price equilibrium given by point A, where industry 1 is skilled workers intensive. An increase in the price of that industry will shift out the iso-cost curve and as illustrated, move to equilibrium to point B (or from C to D). It is clear that the wage W_1 has gone up from W_1^{NA} to W_1^{NT} (or W_1^{SA} to W_1^{ST}), and the wage W_2 has declined. The wages of skilled in both countries move same direction.

Increases in high-tech intra-industry trade will cause increase in wage inequality. Therefore skilled workers gain from trade and unskilled workers loss in both countries.



Graph 1

Where superscript NA means North Autarky, superscript SA means South Autarky. NT=North Trade liberalization; ST= South Trade liberalization.

BEC = break even cost =iso-cost, and $P_2^N=P_2^S=1$

From graph 1, assume the output of the high-tech good is fixed, trade liberalizations will shift demand curve out and price of the high-tech good increases. If a relative increase in the price of a commodity will increase the real return to the factor used intensively in that industry and reduce the real return to the other factor. For high-tech, P_1 increase, implies W_1 goes up (W_2 decrease) Skilled labor of both developed and developing countries gains (both

country move same direction), then skilled workers are more likely to support free trade than unskilled workers.

According to Beaulieu et al (2004b), trade liberalization increases market size, causing the price of the high-tech commodity to increase, raising the wage inequality between skilled and unskilled workers regardless of their relative skill endowments. The empirical evidence shows that for most countries, regardless of their relative skill endowments, skilled workers in twenty-two of the twenty-four countries surveyed are more likely to be opposed protectionism than unskilled workers when the country is actively engaged in intra-industry trade and trade policy is liberalized in this sector (IIT). Beaulieu et al (2004) find a direct relationship between the degree of intra-industry trade and the strength of resistance to protectionism by skilled workers within a country. They conclude that skilled workers in high IIT countries are more likely to support free trade than unskilled workers in those countries.

The new trade theories[3] developed by Gabel (1998), and Beaulieu, Benarroch, and Gaisford (2004a) have been widely used in the investigation of trade policy preferences. The human capital model (Gabel 1998) and intra-industry trade model (Beaulieu, Benarroch, and Gaisford 2004) are two important theories. The human capital model states that a high degree of formal skills makes an individual more adaptable to changing labor markets. As trade

[3] Here I am not referring to new trade theory, which typically refers to specifically to the trade theory based on imperfect competition and scale economies. I am referring to the new theory, which is different from traditional HOS framework.

liberalization shifts employers' demands among high-skilled and low-skilled workers, workers with a relatively large pool of skills will be more likely to maintain their value in the market. Therefore, high-skilled individuals should be more likely to support free trade than low-skilled individuals in all countries, and this positive relationship between skill-level and supportive of free trade should be invariant to a country's factor endowment or comparative advantage (Gabel 1998).

According to the new trade theories of human capital and intra-industry trade, skilled workers get more benefits than unskilled workers, prompting skilled workers to be *more* likely than unskilled workers to support free trade.

2.3 EMPIRICAL STUDIES AS THEY RELATE TO THE TOPIC

One of the famous paradoxes of modern economics was Leontief Paradox (1953). It was the empirical examination of the trade patterns of the United States, a country considered to be the world's most capital abundant country. It was found that its exports were labor intensive while its imports were capital intensive. This result was contrary to the prediction of the Heckscher -Ohlin model. A number of explanations were put forward to reconcile trade theories with the evidence. The most successful were the inclusion of resources and human capital. This was measured by a number of indicators such as skill and education as additional inputs into production. Other alternative theories include the increasing returns to scale, availability thesis, subsequent trade theories, and technology gap. During the late 1950s and early 1960s, it became increasingly obvious that the trade patterns of the

developed countries had come to be dominated by trade among themselves in similar but differentiated goods. This phenomenon, known as intra-industry trade, required a new theoretical explanation because the existing theories could not account for it (Perdikis and Kerr 1998).

Robbins (1996) examined data from nine developing countries to study the impact of trade liberalization upon wages. He examined labor markets in Argentina, Chile, Costa Rica, Colombia, Malaysia, Mexico, the Philippines, Chinese Taipei, and Uruguay. He found that trade liberalization was accompanied by rising relative wages and labor demand. His study focused on whether the evidence of these country studies supported the traditional HOS prediction that trade liberalization will lower wage inequality in developing countries and their broader implications for theory.

Robbins (1996) found that in all these countries relative labor supply grew very rapidly, and that for all except for Chinese Taipei, supply shifts had large negative effects upon relative wages. Based on this finding, he argued that to identify relative demand shifts for these countries, the impact of relative supply on relative wages needed to be netted out to identify relative demand shifts, which might be subsequently related to trade liberalization and the predicted Stolper-Samuelson effects. With his estimation of relative demand shifts, he found that trade liberalization led not to falling, but *rising* relative wages. These findings went contrary to the "naïve" Stolper-Samuelson model. He found that rising levels of imported capital stock to GDP strongly tracked rising relative demand. He argued that this was consistent with what he referred to as the Skill-Enhancing-Trade hypothesis. This

hypothesis suggested an additional channel by which trade liberalization could induce rising relative demand-by rising the imported capital/GDP ratio, tending to raise the overall capital/GDP ratio and serving to accelerate the transfer of what in recent years appeared to be skill-biased technology. He argued that the evidence was consistent with Skill-Enhancing Trade hypothesis, where trade liberalization encouraged the acceleration of the ratio of the imported physical capital stock to GDP in a sector-biased pattern. The attendant capital-skill complementarities and bundled technology (due to skill-biased technological change) would then raise the relative demand for skilled workers. Therefore trade liberalization might sometimes widen wage inequality in developing countries.

Based on the Heckscher-Ohlin theory of international trade, Baker (2004) asked why some individuals were more protective than others. Baker concluded that skill was found to be a critical factor, with individual skill being more positively correlated with free trade support in-high skill than in low-skill countries. Mayda and Rodrik (2001) analyzed a rich cross-country data set that contained information on attitudes toward trade as well as a broad range of socio-demographic, and other, indicators. They found that pro-trade preferences were significantly and robustly correlated with an individual's level of human capital, in the manner predicted by the factor endowments model.

Baker (2004) analyzed the 1995-1997 World Values Survey (WVS), which measured trade attitudes in 43 countries. He classified these countries into three groups, namely, poor countries, middle-income countries, and rich countries. Baker found that at the country level, poor and rich countries have the most protectionist citizens on average, while middle-income

countries are the most liberal. The nature of domestic cleavages over trade policy, while strongly related to class and skill, varied in systematic ways with each country's macroeconomic context. Baker concluded that richer, highly educated, and urban citizens were more likely to support free trade than the rest of the population.

Beaulieu et al (2004a,b) used both inter- and intra-industry North-South trade models to examine the effects of trade liberalization on the wage inequality. They presented a modified Heckscher-Ohlin- Samuelson trade model with Ricardian intra-industry trade in the skill-intensive high-tech sector driven by international differences in technology lags. They found that with different technological progress and adoption lags, with intra-industry trade within high-tech sector, a reduction in the trade barriers could simultaneously raise the wage gap in both developed and developing countries. They argued that trade liberalization had a different effect on wage gaps in North and South countries. For example, when the South lowered barriers to a greater degree than the North, a reduction in high-tech trade barriers might result in a higher wage gap in the North but a smaller wage gap in the south. This result was consistent with Zhu and Trefler (2001), which stated there was a positive correlation between increasing inequality and growth in exports.

Following their theory, Saito (2004) in her MEc project used a survey created by the Chilean company Latinobarometro (the same data as mine) to examine trade preferences and wage inequality trend in Mexico. She found that after 1986 when Mexico started its trade liberalization, skilled workers have gained a skilled premium increasing wage inequality. Her

result supported Beaulieu et al (2004) and showed that the level of skill mattered in trade preferences.

Ng (2004) in his MA thesis used ISSP data collected from the 18 selected countries to examine individual trade preferences. He grouped individual occupations into six groups, which were managerial, professional, clerical, sales, services, and production groups. He argued that if occupations were considered as another measurement of skill level, for most countries, individuals with occupations that required higher skills (such as managers and the professionals) would be more likely to support free trade than those with occupations that required lower skills. He found that individuals with occupations that were abundant in the home country relative to the rest of the world were more likely to support free trade.

The above mentioned papers have concluded that individual skills could explain trade preferences because trade liberalization could explain wage inequality. However, Goldberg and Pavcnik (2003) focused on short and medium run adjustments to trade liberalization. They estimated returns to industry effects instead of worker specific characteristics. They investigated the relationship between protection and industry wages by using the Colombian National Household Survey. They used the panel nature of industry level data that unobserved heterogeneity and political economy factors through industry fixed effect could be controlled conditioning on time-invariant industry attributes reversed the sign of the relationship between tariffs and industry wage differentials from negative (the sign found in previous work) to positive. These results were robust to the inclusion of trade flow variables and their interactions with exchange rate, and conditioning on capital accumulation in each

industry. They concluded that trade protection increases relative wages. This means that an increase in wage inequality, as observed over this period in the 1980s and 1990s, cannot be explained by trade liberalization.

CHAPTER THREE: EMPIRICAL ANALYSIS

Based on theoretical considerations and empirical studies, my approach will be to investigate the effects of the individual skill (education level) on trade preferences and country characteristics on trade preferences by employing binary response probit model. First, I will check the survey result of individual preferences on trade policy in pooled data and separate country data. As well, I will look at the relationship between country characteristics (the degree of IIT, GDP per capita, and education index) and individual preferences on trade policy from survey results. Next, I will look at preference patterns within countries and examine the statistical significance of the difference between skilled and unskilled workers by employing separate country data regression model. Finally, I will also examine how different the patterns will be across countries and determine whether country characteristics will be important determinant of individual preferences on trade policy by employing the pooled data regression model.

I employ the probit models that are typically estimated by maximum likelihood (ML) to do the above regressions. Since separate country regression based on each country data and some data of a country is small, the separate country regression sometimes is not reliable because the maximum likelihood estimator has good properties in large samples. It is risky to use ML with samples smaller than 100, while samples over 500 seem adequate. These values should be raised depending on characteristics of the model and the data (Long 1997). In this paper, the observation number in pooled data of 17 countries is 14703, which is greater than 500. Therefore, we can believe the result of pooled regression. On the other hand, the country-separate regression for each country, some sub-sample size is less than 500, which is

not reliable. In regression, I use joint test for secondary education and tertiary education to proof the results. Therefore I do pooled data regression to compare results and to examine the interaction term between individual skill and country characteristics. As well, I look at the individual preferences on trade policy affected by country characteristics from pooled regression.

3.1 THE EMPIRICAL APPROACH, MODEL

In this subsection, the effects of individual skill and country characteristics on individual trade preferences are examined. Skills are entered as the factors of production in this study and trade preferences are measured at the individual level. The following country-separate data regression of the binary response probit model will be estimated:

$$\Pr(FTg = 1) = F(\beta Xg + \alpha Sg) + \varepsilon \qquad (1)$$

Where FTg is a categorical variable equal to one if the respondent g supports free trade and zero otherwise; Xg is a vector of explanatory variables controlling for potential determinants of trade preferences that are not of primary interest, which include age, sex, marital, and whether the individual is the primary wage earner in the family. Sg is the skill-level of individual g; and F (.) is the probit cumulative distribution function.

After considering each country separately, I examine which characteristics of the different countries have a salient effect on the individual preferences of the skilled and less skilled respondents. The following pooled data regression of the binary response probit model is estimated:

$$\Pr(FTg = 1) = F(\beta Xg + \alpha Sg + \gamma \text{ country dummy}) + \varepsilon \qquad (2)$$

$$\Pr(FTg = 1) = F(\beta Xg + \alpha_1 Sg + \alpha_2 Sg^{*}C_k + \alpha_3 C_k) + \varepsilon \qquad (3)$$

In model (2), the country dummy variable equals to one when choosing specific country and zero for the rest. Model (2) examines individual preferences on trade policy with fixed country effects. In Model (3), C_k is a country characteristic for country k and $Sg^{*}C_k$ is interaction term between individual skill and a subset of the country characteristics. The baseline model (1) (2) and (3) estimates the probability of individual supportive of free trade affected from different individual skill levels, country characteristics, and their interaction term with the same controlling explanatory variables.

Two central variables in the model are individual skill and country characteristics. How do we gauge individual skill level? Most of previous studies used formal education level as a proxy of individual skill. However, Baker (2004) used the economically-relevant aspects of formal education to measure skill, which including formal education level, post-schooling acquisition of skill, income, and occupation. The latter approach to measuring individual skill is more reasonable than using formal education alone by considering experience-based, difference in schooling quality that including quality difference in different school and differences in achievement at same school, and the fact that not all skills are acquired through formal education. In this thesis, I will still choose formal education alone to measure individual skill because the data of economically-relevant aspects of formal education is not available in the survey data.

In order to estimate the effects of country characteristics on individual preferences through the interaction term, we also need a measure of country characteristics. Baker (2004) used the average GDP per capita (at PPP) from 1990 tom1995 (World Bank 2000) and the percentage of the population that had at least some tertiary education in 1995. Beaulieu et al (2004) used GDP per capita, education enrollment, and the number of research scientists and technicians per 1000 population as a proxy for country skill endowment. However, in this paper, because I focus on high-tech intra-industry trade, I use degree of high-tech IIT and GDP per capita of 1996 as basic country characteristic. I also use fraction of import (Fm) and export (Fx) high-tech commodity to total import, as well as country education index. Previous studies found that, using different data sets (O'Rourke and Sinnott 2001; Mayda and Rodrik 2001; Baker 2004; Beaulieu et al 2004), the correlation between individual skill and support for free trade becomes more positive as country skill rises.

Because the survey data I use is based on individual level, I can not predict the national government's position. I can only address the question, "Which country's people are more supportive of free trade?" I use a vector of country characteristics to explain individual preferences by employing model (3). The country characteristics in model are pro-trade if the marginal effects of country characteristics are positive and against trade otherwise. In this paper, I choose *ten* variables as a vector of country characteristics to estimate individual preferences on trade policy by employing pooled data regression model(3).

Model (1), (2) and (3) estimate the marginal effects of individual skills on trade policy preferences under the fixed control variables for each country. According to new trade theory,

$\alpha > 0$ in model (1), (2) and $\alpha_1 > 0$ in model (3) are expected, which is, the higher individual skill levels (the higher formal education levels), the more support for free trade individuals. In other words, the marginal effects of individual education levels on support for free trade should be positive. I will not report the coefficients of country dummy because of space constraint and they are not of primary interests.

In Model (3), α_2 is the coefficient of interaction terms and α_3 is the coefficient of country characteristics. α_2 captures the indirect effect of country characteristic through interaction term and α_3 captures the direct effect of country characteristics. α_2 tells us the impact that country characteristics have on the difference between skilled and unskilled. α_3 tells us whether on average people from countries with certain characteristics are more likely than people from other countries to support free trade. α_3 is not the focus-but is potentially interesting. Its sign will depend on the particular characteristic-not predicted a priori.

The previous studies mentioned the sign of coefficient of interaction term. I discuss the main country characteristics of the degree of IIT, GDP per capita, Fm, Fx, and Education level (eduindex) in turn and predict the sign of coefficient of interaction term (α_2). However, the interaction term cannot be evaluated simply by looking at the sign of its coefficient. How to interpret the sign of coefficient of interaction term? I will discuss this in chapter 3.4.1.

A higher degree of IIT in high-tech implies a larger demand and price of high-tech, which in turn increase the income of skilled workers. The sign of interaction term between

individual skill and the degree of IIT might be positive ($\alpha_2>0$) because skilled worker will get more benefit with more high-tech intra-industry trade.

The previous studies found that, using different data sets (O'Rourke and Sinnott 2001; Mayda and Rodrik 2001; Baker 2004; Beaulieu et al 2004a,b), the correlation between individual skills and support for free trade might be more positive with increased country's skill endowment. The sign of interaction term between individual skill and GDP per capita might be positive ($\alpha_2>0$) because skilled workers benefit more in higher GDP per capita countries.

Latin America is often assumed to be abundant in unskilled workers; HOS framework suggests that such countries might use trade barriers to protect skill-intensive goods. Removing these barriers causes the relative prices of skill-intensive goods to fall. In response to this change in prices, unskilled-intensive industries expand, which raise the demand for unskilled workers. The wages of unskilled workers should increase relative to the wages of more skilled workers, thus reducing income inequality. Besides, skilled workers who work in high-tech sector will lose job opportunity with increased import high-tech. Therefore, the more import high-tech goods, the more oppose trade skilled workers. The sign of interaction term between individual skill and Fm might be negative ($\alpha_2<0$). If some Latin American countries are not abundant in unskilled workers, the sign of coefficient of interaction term will be ambiguous.

The sign of interaction term between individual skill and export fraction of high-tech commodity might be positive ($\alpha_2>0$) because skilled workers tend to get more benefit in higher high-tech export countries.

The sign of interaction of individual skill and country education index might be positive ($\alpha_2>0$). Previous studies mentioned that the relationship between individual skill and pro-trade becomes more positive as country skill increased.

The models contain four other fixed independent variables describing individual status. These variables are: age, sex, marital, and finc (family primary wage earner).

Age: Older workers have more difficulties adapting themselves to the changes in labor markets, and they also face more discrimination when looking for new jobs. They may be more worried about. Therefore the age is expected to be negatively correlated with support for free trade.

Sex: Like the elder, women face a more precarious labor market than man because of child-birth, child-raising, and discrimination. Sex is a dummy variable, 1 for man and 0 for women. The marginal effect is expected to be positive. This means that man is expected to support free trade more than women (Baker 2004)

Marital status: Married people face the problems of children-raising, family-supporting. Marital status is a dummy variable. 1 for married and 0 for not married. The marginal effect is expected to be negative,

Finc: It is a dummy variable, 1 for the primary wage earner in the family and 0 otherwise. The individuals who are the primary wage earner in the family may, like married people, have more duty to support family and the marginal effect is expected to be negative.

3.2 THE DATA SETS

This subsection shows the dependent variables included in a binary probit model regression of trade policy preferences in 17 countries of Latin America. The independent variables include individuals' skill, country characteristics and other fixed personal status variables. The data is taken from the 1996 Latinobarometro survey, which collected in a survey of responders in the 17 countries of Latin America in 1996. The questionnaire contains a variety of questions concerning international relationship as well as some additional questions involving individual status, knowledge, skill-level, and preference. This thesis focuses on question P51, which asks a general trade liberalization question: Generally speaking, do you think that trade with other countries, both the buying and selling of products, helps [nation's] economy or harms [nation's] economy? In addition, for comparison purposes, a regional trade liberalization question P58, which asks [nation] benefits or not from its future links with [regional trading block], was also included in this thesis. I expect the same results from these two questions because regional trade

liberalization belongs to general trade liberalization. The questions directly ask if the individual is supportive. It is true a person might support something because it will make himself or herself better off, but the above two questions accept that a person may also see things broadly in terms of the nation's well-being, availability of goods, and aggregate welfare etc. It would be very important to draw a link between this survey tool and earlier papers.

It is hoped that because of complete anonymity that individuals will comply with the request to participate in the survey and provide honest and truthful responses. The survey is designed to ask a number of questions on one topic and approach the topic. This study is only interesting in some topics, which concerning in general trade liberalization and personal status. All data were collected by means of face-to-face interviews (Interviewer: write only one choice) with individuals. The additional topics ask questions about individual's gender, family size, family income, marital status, education, and working status.

The data of individual trade preferences, individual status, and individual education levels come from the 1996 Lationobarometro survey. The four fixed variables except age are dummy variable, which contains data 0 and 1. Age variable from 1 to 99 is a continuous variable. Sex variable is category variable that 1 for male and 0 for female. Marital variable is category variable that 1 for married and 0 for single, separate, and other situation. Whether the individual is the primary wage earner in the family is category variable that 1 for the individual is the primary wage earner in the family and 0 otherwise.

We use the highest level of formal education achieved to measure individual skill in this paper. According to the years of education, I classify education levels into three groups, namely, primary, secondary, and tertiary education level. The primary education level represents unskilled workers that including individuals whose education years are below and equal to 6 years. The secondary education level represents medium skilled workers that including individuals whose education years are between 7 years to 12 years. The tertiary education level represents high skilled workers that including individuals whose education years are above and equal to 13 years.

The main country characteristics are GDP per capita, the degree of IIT, education index, high-tech import fraction % of total trade (Fm), and high-tech export fraction % of total trade (Fx). These variables are used for test interaction between individual skill and country characteristics. In order to empirically examine the questions: based on the survey data, which country's people are on average more supportive of free trade? Does FDI of these countries affect support for free trade? Whether or not they have undergone structural assistance or restructuring from IMF and what's the effect of using IMF credit to affect support for free trade? How about openness of the country etc.? I choose ten country characteristics to answer those questions. Namely, GDP per capita (at PPP), Gross Foreign Direct Investment (FDI % of GDP), Unemployment (of total labor force), Inflation (consumer prices annual %), Urban population growth (annual %), Urban population (% of total), Use of IMF credit (DOD, current US$), High-technology exports (current US$), School enrollment tertiary (% gross), and Openness (Trade % of GDP). Except for Fm, Fx,

and the degree of IIT, these data of country characteristics come from Human Development Indicators.

Education index of a country is based on the adult literacy and the combined primary secondary and tertiary gross enrolment ratio. As a result of revisions to data and methodology, human development index values are not strictly comparable with those in earlier Human Development Reports. The index has been calculated for UN member countries with reliable data in each of its components as well as for Hong Kong and the Occupied Palestinian Territory (Human Development Indicators 2003).

The data of degree of IIT come from author calculations based on trade in high-tech manufacturing industries, which come from World Trade Analyzer. The existence of IIT is a key factor in the intra-industry trade model. How can we estimate the extent of intra-industry trade in a given industry? The most commonly used technique is an intra-industry trade (IIT) index. The formula for computing single commodity IIT index, originally developed by Herbert Grubel and Peter Lloyd (1975), is the following: $IIT=100[1-(|e_j-i_j|)/(e_j+i_j)]$. Where e_j is export of good j and i_j is the import of good j. The vertical bars in the numerator denote absolute value. The degree of IIT varies from 0 to 1 as intra industry trade increases. The degree of IIT is equal to zero if either imports or exports are zero and equal to one if the exports of commodity **j** is equal to its imports. To calculate the aggregate IIT for a country, the formula: $IIT_{Jk}= 1- \Sigma |F_{je}-F_{ji}| / (F_{Je}+F_{Ji})$ is used in this thesis. Where **J** represents a subset of goods, **F** means fraction, total exports and imports within this subset by country **k** can be denoted as: $F_{je} =e_{jk}/e_k$, $F_{ji} =i_{jk}/i_k$; $F_{Je}= \Sigma F_{je}$, $F_{Ji} = \Sigma F_{ji}$ and $j \in J$. In order to

estimate the demand for skilled workers, the high-tech degree of IIT is calculated in this thesis. The calculation of the high-tech subset of goods **j** by SITC the following items: SITC 5xxx chemicals and related products, n.e.s., SITC 7xxx machinery and transport equipment, SITC 87xx-8999 professional, scientific & controlling instruments, and SITC 9510 armoured fighting vehicles, arms of war & ammunit.

GDP per capita is a good proxy for the education endowment of a country. Earlier papers found that the difference in support free trade between skilled and unskilled workers was larger in high GDP per capita countries and smaller in low GDP per capita countries. The data of GDP per capita of 1996 are collected from Human Development Indicator.

The data of Fm and Fx come from author calculations based on trade in high-tech manufacturing industries, which come from World Trade Analyzer.

The data on worker's characteristics have several shortcomings. First, although the union status is often an important determinant of individual earning, the data do not provide information on unionization. Second, some of the observations are missed in the data of personal status (such as occupational status and father education levels). Some data are not available (such as living in urban or rural, rich or poor, and political party); these variables play important roles in previous research. Third, these cross sectional data are collected from year 1996 without time series. The unobserved heterogeneity and political factors in panel data therefore can not be captured.

3.3 THE RESULTS

3.3.1 THE RESULTS OF SURVEY DESCRIPTION

The main results come from survey question P51 for general free trade. Of the 18709 respondents interviewed in 1996 survey, 4006 individuals refused to answer the question or said "don't know". 14703 respondents (see Table 1A) completely answer all the questions we interested including dependant variable and all independent variables in the models.

As the survey results showed in the *Table 1A*, 78.77% of the 14,703 individuals from all countries answer that general free trade helps nation's economy. 21.23% of samples answer that general free trade harms nation's economy. Support for free trade (answer helps nation's economy) becomes progressive with educational level (75.48%, 76.02%, and 81.75% for those with primary, secondary, and tertiary education level respectively). The Pearson Chi square statistic, reported in the table, rejects the null hypothesis that trade-policy preferences and educational attainment are statistically independent. This is prima facie evidence that preferences on trade policy in Latin America are different for skilled and unskilled workers.

Table 2A presents some summary statistics for the first three-column provide country level data with information on degree of IIT, GDP per capita, and education level in the country. Based on IIT model, the degree of IIT plays a crucial role in individual preferences. Therefore, I rank countries by the degree of IIT and check the individual preference trends. From the *Table 2A*, we can find that high-tech degree of IIT is not zero in all 17 countries from 0.055 of PARAGUAY to 0.612 of Mexico. The data shows high-tech IIT existing in

Latin American countries. Under liberalized trade, the relationship between individual trade policy preferences and individual education level should be more positive as the degree of IIT rise according to IIT model (Beaulieu et al 2004). The last three-column in the *Table 2A* provide summary statistics from the survey for each country. The table reveals that lower and higher IIT countries are on average less support for free trade (76.96% and 75.13%) while medium IIT countries are on average more support for free trade (82.87%). It looks that support for free trade is concave ($\cap$) in degree of IIT before statistic significant testing.

The same summary statistics as the *Table 2A*, the difference is the rank of countries sorted by education levels of countries instead of the degree of IIT. As the survey results show in the *Table 3A*, the higher education level of country groups (0.69, 0.858, and 0.923), the less people's supportive of free trade (79.0%, 78.9%, and 77.3%).

3.3.2 THE COUNTRY-SEPARATE DATA REGRESSION RESULTS

Table 4A presents the marginal effects from regressing trade preferences on individual characteristics including education levels; and the four fixed control variables such as gender, age, marital status, and whether the individual is the primary wage earner in the family. I run model (1) for each country. The control variables are suppressed for space considerations and not interesting. The education variables are categorical variables with "edu2" representing those with secondary education and with "edu3" representing those with tertiary education. Those with primary education are the omitted category. The countries are

sorted from low degree to high degree of IIT. The marginal effects on dummy variables are interpreted as the effect on the probability of support free trade for a discrete change.

As seen in *Table 4A*, highly skilled workers with tertiary versus primary education are more likely to support free trade in 14 out of 17 countries but only 7 countries are t-test statistically significant at the 10% level. The effect of tertiary education on support for free trade is only *reversed* in **PERU** and **URUGUAY** but not significant. Skilled workers with secondary education levels versus primal education level are more likely to support free trade in 9 out 17 countries but only 4 countries are t-test statistically significant. The marginal effect of secondary education on support for free trade is only reversed in **URUGUAY** and significant. **Uruguay** is among the richest countries in Latin America and **Peru** is much poorer-but not as poor as **Bolivia** or **Ecuador**. Skilled workers with secondary education levels versus primary education level are more likely to oppose free trade in 8 out 17 countries but only 4 countries are F-test statistically significant. So, in 4 countries (**Paraguay**, **Honduras**, **Brazil**, and **Mexico**) workers with secondary education are different from one with primary education. However, the differences in preferences between skilled and unskilled workers are F-test (for edu2 and edu3) statistically significant at the 10% level in 9 of the 17 countries. Specially, **Costa Rica** has positive and significant coefficients on both edu2 and edu3, but it is surprising that education variables are not jointly significant. Including **Costa Rica**, skilled workers are more likely to support free trade in 10 out of 17 countries.

From *Graph 2*, the marginal effect of the tertiary education level (pink curve) is greater than secondary education level (blue curve). The above result is consistent with other researcher's result (Robbins 1996; Zhu and Trefler 2001; O'Rourke and Sinnott 2001; Das 2002; Mayda and Rodrik 2001; Baker 2004; Beaulieu et al 2004). However, there does not appear to be a strong pattern appearing in these data for Latin American countries. Skilled workers are more supportive of trade than unskilled in some of the countries with the lowest degree of IIT like **Bolivia** (the poorest country in the sample), **Ecuador**, **Venezuela** and **Colombia. Brazil** is the only high-IIT country in Latin America where skilled workers are more supportive of trade than unskilled workers. This is inconsistent with the IIT model by Beaulieu et al (2004a, b) who find that the difference in support for free trade between skilled and unskilled workers is larger in countries that are more engaged in IIT trade. This lack of a pattern across countries can be seen in *Graph 2* that presents the marginal effects on the education variable against the country degree of IIT and pooled data regression results in Table 5A.

3.3.3 THE POOLED DATA REGRESSION RESULTS

When the responders from all countries are pooled together I find that skilled workers in Latin America systematically tend to have a greater preference for trade liberalization than their unskilled counterparts. The results from estimating two different models using pooled data are reported in Table 5A, 6A, and 7A. In the *Table 5A*, the first three-column shows the marginal effects of individual education levels and four fixed controlled variables on supports for free trade by employing model(2). Country dummy variables are used to control

for fixed country effects. The next two three-column in Table 5A examine whether the degree of IIT or GDP per capita in a country affects individual trade preferences and relationship between individual skill and trade preferences by employing model (3).

In model (2) and (3) in Table 5A, those with tertiary education are more likely to support trade than those with primary education. This difference in preferences is statistically significant at the 1 percent level. Secondary education is positive, but not statistically significant. These results are robust to including interaction terms into the regression. The focus here is whether or not country characteristics like IIT or GDP per capita affect the relationship between individual skill and preferences on trade policy. In this case the interaction terms are not significant. These results are starkly different from the results of previous researchers. One result that holds true is that on average people from countries with higher GDP per capita are more likely to support free trade than people from other countries. However, GDP per capita does not modify the difference in preferences between skilled and unskilled.

The model (3) presented in *Table 6A* examine whether the country characteristics like Fm, Fx, and education level in a country affects individual trade preferences and relationship between individual skill and trade preferences. From all three three-column results, all secondary education is not statistically significant. Tertiary education is positive, but only in the second three-column that model (3) employing country variable Fx and statistically significant at the 1 percent level. The interaction term for individual skill with Fm is not statistically significant. The interaction term for individual education level with Fx is

statistically significant at 10% and the coefficient is negative. That means with more high-tech exports the relationship between individual skill and pro-trade are *less* positive. It is inconsistent with Zhu and Trefler (2001) who found that there is a positive correlation between increasing inequality and growth in exports. The third three-column shows that the country education level and the interaction term for individual education with country education level are not significant. This result is inconsistent with survey result, which states that there is a negative relationship between individual supports for free trade and country education index. One result holds true is that on average people from higher high-tech import fraction countries are more likely to oppose free trade. The signs of coefficient of four fixed variables are not significant except for variable sex that is positive and significant as expected that states male is likely to support free trade than female. Other fixed variables are not statistically significant.

The model (3) presented in *Table 7A* shows the marginal effects of country characteristics on individual supports for free trade. The coefficients of GDP, FDI, and Unemployment are positive and statistically significant in both t-test and joint test (for edu2 and edu3). That means people from countries of higher GDP per capita, more FDI, and higher unemployment are more supportive of free trade. The signs of coefficient of inflation and urban population growth (annual %) are *negative* with statistically significant. That means people from countries of higher inflation and fast urban population growth (annual %) are more likely to oppose free trade. The signs of coefficient of urban population % of total, school enrollment of tertiary % total, and trade % of GDP are positive and use of IMF credit, high-tech exports are negative but none of them are statistically significant.

Looking at Table 6A and Table 7A, the top three nations whose people support free trade are Argentina, Chile, and Mexico. Those results reflect the current FTAA situation although people's preferences can be different from their government's preferences.

3.3.4 OTHER QUESTION RESULTS AS COMPARISON (table B series)

To make a comparison, I look at the survey question P58 "All things considered, would you say that [nation] benefits or not from its future links with [regional trading block]". *Table 1B* presents some summary survey results. 82.13% of the 14,196 individuals from all countries said "yes" and the rest said "no". The Pearson chi square statistic, reported in the table, rejects the null hypothesis that trade-policy preferences for regional trade and educational attainment are statistically independent. Surprisingly, compared with *Table 1A*, the survey results are different from question P51 regarding general free trade. In other words, while most people support general free trade, they oppose regional free trade at the same time. It is well known that survey responses tend to be highly sensitive to framing—the phrasing of the question and the context and order in which it is asked. My results indicate that there is no obvious relationship between educational level (20.10%, 16.55%, and 18.48% for those with primary, secondary, and tertiary education respectively) and individual preferences regarding regional free trade.

Table 4B reports the results from country-separate data regression for regional free trade. Country level data on degree of IIT and GDP per capita are reported in the first two columns

respectively. The second three-column reports the marginal effects of edu2 on individual preferences regarding regional trade. Individuals with edu2 level are more likely to support regional free trade in 9 out of 17 Latin American countries and only two of sample countries are significant in F-test. Individual with edu2 level are more likely to oppose regional free trade in 8 out of 17 sample countries and only one of sample countries is F-test significant. The third three-column reports the marginal effects of edu3 on individual regional trade preferences. Individuals with edu3 level are more likely to support regional free trade in 6 out of 17 sample countries and only two of the countries are F-test significant. Individuals with edu3 level are more likely to oppose regional trade in 11 out of 17 sample countries and only one country F-test is significant and one country t-test is significant. The differences in preferences between skilled and unskilled are statistically significant in at least one of the two tests (t-test and F-test) in only 5 out 17 countries, namely, **Chile, Venezuela, Guatemala, Costa Rica**, and **Salvador**. In these countries, skilled workers from **Chile, Costa Rica**, and **Salvador** oppose regional free trade. Skilled workers from **Venezuela** and **Guatemala** support regional free trade.

The pooled data regression results are mixed shown in *Table 5B, 6B*, and *7B*. In the *Table 5B*, the first column shows that with country dummy but no country characteristics, marginal effects of edu2 and edu3 are negative. That means skilled workers are more likely to *oppose* regional free trade than unskilled workers. However either t-test or joint test for edu2 and edu3 both are *not* significant in the first column. The second column shows that with interaction of the country degree of IIT, skilled worker with secondary educational level are more *oppose* to free trade than primary education level, but skilled workers with tertiary

educational level are more *supportive of regional* free trade than secondary education level. The sign of coefficient of IIT is positive, that means the higher degree of IIT, the more people support for regional free trade. It is regretful that either t-test or joint test for edu2 and edu3 are *not* significant for individual education level and IIT in the second column. The third column shows that with interaction of country GDP per capita, the sign of coefficient of edu2, edu3, and GDP per capita are all positive. It is exciting that both t-test and joint test for them are significant in the third column. That means skilled workers with either secondary or tertiary educational levels are more likely to *support* regional free trade than primary educational level with statistically significant. People from higher GDP per capita countries are *more* supportive of regional free trade than other countries. The sign of interaction term between individual skill and GDP per capita is negative and significant. That means with increased GDP per capita, the relationship between individual skills and supportive of free regional trade becomes *less* positive.

Table 6B shows the marginal effect of individual education on individual support for regional free trade and interaction term between individual skill and Fm, Fx and education index (eduindex). The first column shows interaction term between individual skill and Fm, the signs of coefficient of edu2 and edu3 are positive and the sign of coefficient of Fm is negative. Unfortunately, either t-test or joint test for edu2 and edu3 are not statistically significant in the first column. The second column shows interaction term between individual skill and Fx, the sign of coefficient of edu2 is negative but t-test is not significant. The signs of coefficient of edu3 and Fx are positive with both t-test and joint test for edu2 and edu3 are significant. That means skilled workers with tertiary education level are *more* supportive of

regional free trade and people from higher fraction of exports of high-tech goods are *more* supportive of regional free trade. The signs of interaction term between individual skill and Fx are negative and significant. That means with increased high-tech export fraction, the relationship between tertiary educated workers and supportive of free regional trade becomes *less* positive. The third column shows interaction term between individual skill and country education level (eduindex), the signs of coefficient of edu2 and edu3 are positive and the sign of coefficient of eduindex is negative. However, either t-test or joint test for edu2 and edu3 are *not* significant in the third column. The sign of interaction term between individual secondary education and country education level is negative and t-test is significant. That means the relationship between individuals with secondary education level and supportive of regional free trade becomes less positive as country education level rise.

From the above results, under both t-test and joint test for edu2 and edu3 are significant, pooled data regression shows that on average, skilled workers are *more support* for regional free trade than unskilled workers; In addition, people from higher GDP per capita and higher exports of high-tech goods countries are *more* supportive of regional free trade. These results are inconsistent with survey and country-separate regression but it is consistent with general free trade regression both country-separate and pooled data results.

Table 7B shows result of interaction with country characteristics. I don't report the coefficient of edu2, edu3, of interaction with edu2 and edu3, and the coefficient of fixed variables (age, sex, marital, and finc) due to space constraint. From the result of *Table 7B*, The people from these countries with higher GDP per capita, higher school enrollment of

tertiary % of gross, higher inflation (consumer prices annual%) are significantly *more supportive of* regional free trade. The openness (trade % of GDP), Unemployment, Urban population(both % of total and growth annual %), use of IMF credit, Gross FDI, and high-tech exports do not affect individual preferences for regional free trade.

3.4 ROBUSTNESS, SEPCIFICATION, AND DIAGNOSTICS

3.4.1 HOW TO EXPLAIN THE INTERACTION IN PROBIT MODEL

Since the model is nonlinear model, the interaction effect cannot be evaluated simply by looking at the sign, magnitude, or statistical significance of the coefficient in the interaction term. Instead, the interaction effect requires to compute the cross derivative or cross difference. Like the marginal effect of a single variable, the magnitude of the interaction effect depends on all the covariates in the model. In addition, it can have different signs for different observations, making simple summary measures of the interaction effect difficult. (Ai et al 2003).

Consider a Probit model $E[y \mid x_1,x_2,\mathbf{X}]=\Phi(\beta_1 X_1+ \beta_2 X_2+ \beta_{12} X_1X_2+ \mathbf{X}\beta)= \Phi(.)$, the interaction effect is the cross derivative of the expected value of y

$$\frac{\partial 2\phi(.)}{\partial x1 \partial x2} = \beta_{12}\Phi'(.)+(\beta_1+\beta_2 X_2)(\beta_2+\beta_{12}X_1)\Phi''(.)$$

Even though $\beta_{12}=0$, the interaction effect is $(\beta_1+\beta_2 X_2)\beta_2\Phi''(.)$

Therefore, the statistical significance of the interaction effect cannot be tested with simple t-test on the coefficient of the interaction term β_{12}. The interaction effect may have different signs for different values of covariates. Therefore, the sign of β_{12} does not necessarily indicate the sign of the interaction effect.

3.4.2 ENDOGENEITY, HETEROSCEDASTICITY, AND MISSPECIFICATION PROBLEM

White test:

Because group data comes from 17 countries, the data could have heteroscedasticity problem. Then I use White test, which idea is follows:

Suppose we have a regression Y= f(X1, X2) +u, after estimation, we get residual uhat, then we regress $U^2=\delta_0+\delta_1 x_1+\delta_2 X_2+\delta_3 X_1^2+\delta_4 X_2^2+\delta_5 X_1 X_2+error$. Null hypothesis is: $\delta 1=\delta 2=\delta 3=\delta 4=\delta 5=0$ that means variance is constant. With F-test or t-test, I do not reject null hypothesis that heteroscedasticity exists in this cross section regression. Then I use robust white standard error to correct it in all regression.

Hausman test:

Another problem is endogeneity problem. I worry about if education level is not independent variables, so I use Hausman test to check. After choosing parent's education level as instrument variable to test. The two stage test idea is as follows:

In the regression $Y_1=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+u$, if X_1 is endogenously, then $\text{cov}(x_1,u)\neq 0$. The first step is to find instrument variable Z and then regress $X_1=\lambda_0+\lambda 1Z+\lambda 2X2+\lambda 3X3+v$.

Because Z, X_2, X_3 is uncorrelated with u, therefore the condition $\text{cov}(x_1,u)\neq 0$ holds, if only if $\text{cov}(v,u)\neq 0$. The test $u=\delta v+e$ with null hypothesis $\delta=0$ can solve this problem. But we don't know v, we can get estimator vhat=X_1-($\lambda_0+\lambda_1Z+\lambda_2X_2+\lambda_3X_3$), then we can regress $Y_1=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\delta vhat+error$ the test with null hypothesis $\delta=0$ can be used. If we reject null hypothesis, then X_1 is endogenous variable.

In this thesis, I want to estimate a probit model with an explanatory variable--education; some fairly strong assumption must be made. That is, explanatory variable to be test should be a continuous endogenous explanatory variable. Write the model as structural equations:

$Y_1^*=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+u$

$X1=\lambda_0+\lambda 1Z+\lambda 2X2+\lambda 3X3+v$

$Y_1=1\ [Y_1^*>0]$

Where (u,v) has a zero mean, bivariate normal distribution and is independent of Z. If u and v are correlated, X_1 will be endogenous variable. If u and v are independent, there is no endogeneity problem. Because v is normally distributed, X_1 given Z is normal is assumed. Thus X_1 should have features of a normal random variable. (For example, X_1 should not be a discrete variable).

I use Hausman test to test endogeneity problem for independent variable education for general trade preference model, the result shows that we do not reject null hypothesis that education is an endogenous variable (p=47.2%). Therefore, education variable is an endogenous variable in this general trade preference probit model. And then I use father education as instrument variable (IV) and two stage IV procedures to correct this problem. Because education variable should not be a discrete variable as assumption request in the endogenous problem test (Wooldridge 2002), I use original education data that is education years as independent variable and then use education estimation data (eduhat) instead of original education data as comparison and shown in the *Table 4C, 5C,* and *6C*. Marginal effect of eduhat means high education level to low level education level. The country-separate regression result shows in the *Table 4C* that the coefficient of marginal effect of eduhat in 13 countries out of 17 countries have positive sign but only 5 country of the 17 country is statistic significant. Skilled worker living in **Bolivia, Ecuador, Honduras, Chile,** and **Salvador** (compare to these 10 countries before endogeneity correction: **Bolivia, Ecuador, Venezuela, Colombia, Brazil, Paraguay, Honduras, Salvador, Mexico, and Costa Rica)** are *more* likely to *support* for trade liberalization than unskilled workers. One notable country is **Chile,** it is not significant before endogenous problem correction, but skilled workers are pro-trade than unskilled workers and significant in **Chile**. On the other hand, skilled workers living in **Uruguay** and **Guatemala** (compare to these two countries before endogeneity correction: **Uruguay** and **Peru)** are more likely to oppose free trade than unskilled workers. Above results are a little different from the results of these before individual education endogeneity problem correction but most of them are same.

Because country-separate regressions (*Table 4C*) suggest that some country marginal effects of skilled workers tend to be positive and some country marginal effects of skilled workers tend to be negative, the *Table 5C* and *6C* results are pooled data regression to examine how individual preferences on general trade after endogenous problem correction. The pooled data regressions reveal that on average higher education level is *more supportive of* free trade than lower education level; they are significant except for the model employing the variable of country education index. These results are the same as the results of these before individual education endogeneity problem correction.

After endogeneity problem correction for pooled data regression, the coefficients of sex and GDP per capita are positive and significant as expected. However, the coefficients of IIT index, Fm, Fx, and eduindex are not significant. The interaction terms between individual skill and the degree of IIT (negative), GDP per capita (positive) are significant. It makes the relationship between individual skill and pro-trade more positive with increased GDP per capita and less positive with increased the degree of IIT. These results are a little different from the results of these before individual education endogenous problem correction.

On the other hand, by using the Hausman test to test endogeneity problem of independent variable education in regional trade preference model, the result shows that we reject null hypothesis that education is an endogenous variable in regional trade preference model.

Ramsey Reset test:

It is a general test for model specification error. Null hypothesis is correct model specification against incorrect specification. Estimate augmented regression

$Y = X\beta + Z\alpha + u \quad H_0 : \alpha = 0$

Vector Z is predicted values of the dependent variable, $Z = [\hat{Y}^2, \hat{Y}^3, \hat{Y}^4]$.

The Reset test has power against many forms of model misspecification and is particularly useful when the maintained model has under-represented the curvature of the function it intends to estimate. The Reset test is performed by testing the asymptotic significance of polynomial terms formed from the predictions of dependent variables from the maintained model (Beggs 1987). The test result shows that these models are well defined.

CHAPTER FOUR: CONCLUSION

While free trade may result in aggregate consumption gains, these gains are not necessarily distributed evenly among the members of society. Indeed, it is possible that certain groups will actually be worse off in a situation of free trade than in an autarky or a restricted trade situation. For example, the gains from trade will not be shared equally by all citizens of a country. Because individuals have different tastes or endowments, some individuals may even be worse off. In the absence of income redistribution to compensate the losers, some groups will rationally oppose any move to free trade and may lobby hard for protection. This thesis extends the empirical analysis of who supports free trade to the 17 countries in Latin America.

This thesis examines individual trade preferences by using probit model. It explores the effects of national characteristic, which is degree of IIT, GDP per capita, education index, fraction of import and export of high-tech commodity to total trade, on individual trade preferences. It also explores the relationship between individual trade preferences and variables describing personal status other than skill level, such as age, sex, marital status, and whether the individual is the primary wage earner in the family.

The empirical results suggest that on average (the pooled data regression) skilled workers are more likely than unskilled workers to support free trade in Latin American countries. Country-separate regressions reveal that this pattern is observed in 10 out of 17 Latin American countries in the sample. It is consistent with the prediction of new trade theory and contradictory to HOS framework.

I find that people from countries of higher GDP per capita, higher FDI ratio, and higher unemployment are more likely to support free trade. On the other side, people from countries with higher import high-tech commodities (% of total trade), inflation, Urban population growth (annual %) are more likely to oppose free trade.

The empirical results show that the openness of country (trade % of GDP), the degree of IIT, high-tech exports, country education index, and use of IMF credit do not have an effect on people's trade preferences.

The results, which do not take endogeneity problem into consideration, reveal that interaction terms between individual skill and GDP per capita, or the degree of IIT, or country education index are all not significant. This is in stark contrast to earlier work, which found stronger support among skilled workers, and some county characteristics such as degree of IIT, GDP per capita have important interaction roles across a range of transitional economies. However, after correcting for endogenous, education level variable, the interaction terms between individual education hat and the degree of IIT (negative effects) or GDP per capita (positive effects) are significant.

The top three countries whose people support free trade are Argentina, Chile, and Mexico. Though people's preferences can be different from government's preferences, this result reflect the current FTAA situation. Normally, this result will not hold because elections, policy changes by the government, and the degree of democracy make the relationship between the people's preferences and their government's preferences complicated. However,

in the analysis performed in this thesis, the government preferences are consistent with the majority of the people.

Besides, the results from regional trade question survey and country separate regression for regional trade show that people have different preference from general trade. However, the pooled data regression result of regional trade is consistent with general trade.

Table 1A: Survey results of individual supports for free trade subject to their education levels (P51 data for general free trade)

Education level	**Primary**	**Secondary**	**Tertiary**	**Total**
Oppose free trade	374	1436	1312	3122
Row (percent)	11.98%	46.00%	42.02%	100%
Column (percent)	24.52%	23.98%	18.25%	**21.23%**
Support free trade	1151	4552	5878	11581
Row (percent)	9.94%	39.31%	50.75%	100%
Column (percent)	**75.48%**	**76.02%**	**81.75%**	**78.77%**
Total	1525	5988	7190	**14703**
Row (percent)	10.37%	40.73%	48.90%	100.00%

Pearson chi2 test for independence: 144.67

Based on the survey question P51 "Generally speaking, do you think that trade with other countries, both the buying and selling of products, helps [nation's] economy or harms [nation's] economy?"
I delete individuals who didn't answer question or said don't know from original data 18709 respondents and 14703 respondents left.
Source: author calculations based on the 1996 Latinobarometro and pooled data from 17 countries in Latin America.

Table 2A: Survey results about individual supports for free trade subject to country degree of IIT, GDP per capita, and education index sorted by IIT group

Country	Country data			Survey data		
Low IIT index group	IIT	GDP pc in 1996	Edu Index	Total R's	Support FT R's	support FT%
PARAGUAY	0.05	5260	0.84	476	302	63.45%
BOLIVIA	0.06	2150	0.85	686	524	76.38%
NICARAGUA	0.06	2520	0.66	857	750	87.51%
PERU	0.12	4260	0.88	961	744	77.42%
ECUADOR	0.13	3140	0.85	1126	901	80.02%
HONDURAS	0.14	2800	0.71	744	529	71.10%
CHILE	0.16	7090	0.89	1001	870	86.91%
VENEZUELA	0.17	5670	0.84	1235	900	72.87%
Average	**0.11**	4111.25	0.815			**76.96%**
Medium IIT group						
COLOMBIA	0.27	7730	0.85	1138	1014	89.10%
PANAMA	0.28	5040	0.86	458	413	90.17%
URUGUAY	0.32	8090	0.93	1056	820	77.65%
GUATEMALA	0.32	4000	0.65	467	348	74.52%
COSTA RICA	0.33	7880	0.86	681	565	82.97%
SALVADOR	0.35	4670	0.74	633	524	82.78%
Average	**0.31**	6235	0.815			**82.87%**
High IIT group						
ARGENTINA	0.43	11010	0.94	902	713	79.05%
BRAZIL	0.50	6580	0.9	1000	752	75.20%
MEXICO	0.61	7100	0.86	1282	912	71.14%
Average	**0.51**	8230	0.9			**75.13%**
Overall	0.28	6188.3	0.838	14703	11581	78.77%

IIT = country **I**ntra **I**ndustry **T**rade of high-tech commodities index, data source: author calculations based on trade in high-tech manufacturing industries (Chemicals SITC5000-5999; Machinery and Equipment SITC7000-7999; Instruments SITC8700-8999; and Armoured Fighting Vehicles SITC9510), which comes from World Trade Analysis.

The formula is: $IIT_{Jk} = 1 - \Sigma \left| F_{jx} - F_{jm} \right| / (F_{Jx} + F_{Jm})$, Where **J** represents a subset of goods, total exports and imports within this subset by country **k** can be denoted as: $F_{jx} = X_{jk}/X_k$, $F_{jm} = M_{jk}/M_k$; $F_{Jx} = \Sigma F_{jx}$, $F_{Jm} = \Sigma F_{jm}$. **F** means fraction, **j** means commodity, **x** means export, **m** means import, and $j \in J$

GDP=GDP per capita(PPP, current international $) in 1996 is from World Development Indicators (World Bank)

eduindex = country education index, data comes from the United Nations 1996 Human Development Report.

R,s = responders

Table 3A: Survey results of individuals support for general free trade sorted by country education index (eduindex)

	Country data			Survey data		
Country	IIT	GDP pc in 1996	Edu Index	Support FT R's	Total R's	Support FT %
Low education index						
GUATEMALA	0.32	4000	0.65	348	467	74.52%
NICARAGUA	0.06	2520	0.66	750	857	87.51%
HONDURAS	0.14	2800	0.71	529	744	71.10%
SALVADOR	0.35	4670	0.74	524	633	82.78%
Low index Average			**0.69**			**78.98%**
Medium education index						
PARAGUAY	0.05	5260	0.84	302	476	63.45%
VENEZUELA	0.17	5670	0.84	900	1235	72.87%
BOLIVIA	0.06	2150	0.85	524	686	76.38%
ECUADOR	0.13	3140	0.85	901	1126	80.02%
COLOMBIA	0.27	7730	0.85	1014	1138	89.10%
PANAMA	0.28	5040	0.86	413	458	90.17%
COSTA RICA	0.33	7880	0.86	565	681	82.97%
MEXICO	0.61	7100	0.86	912	1282	71.14%
PERU	0.12	4260	0.88	744	961	77.42%
CHILE	0.16	7090	0.89	870	1001	86.91%
Medium index Average			**0.858**			**79.04%**
High education index						
BRAZIL	0.50	6580	0.9	752	1000	75.20%
URUGUAY	0.32	8090	0.93	820	1056	77.65%
ARGENTINA	0.43	11010	0.94	713	902	79.05%
High index Average			**0.923**			**77.30%**

Table 4A: The marginal effects of individual education levels on individual supports for free trade sorted by country degree of IIT from country-separate regression by using model(1)

Country	IIT	GDP 1996	Education 2 Marginal effect	Std error	P>|z|	Education 3 Marginal effect	Std Error	P>|z|	Joint test Prob>chi2	Freq.	Pseudo R^2
Low IIT index											
PARAGUAY	0.05	5260	-0.060	0.086	0.502	0.074	0.084	0.381	**0.0216**	476	0.0252
BOLIVIA	0.06	2150	**0.129****	0.047	0.015	**0.199*****	0.060	0	**0.0021**	686	0.0357
NICARAGUA	0.06	2520	0.015	0.032	0.652	0.026	0.032	0.432	0.7261	857	0.0035
PERU	0.12	4260	-0.060	0.060	0.281	-0.020	0.056	0.748	0.2487	961	0.0093
ECUADOR	0.13	3140	**0.105*****	0.038	0.009	**0.160*****	0.043	0	**0.0006**	1126	0.0246
HONDURAS	0.14	2800	-0.070	0.055	0.208	0.013	0.053	0.812	**0.0710**	744	0.0073
CHILE	0.16	7090	-0.050	0.052	0.317	-0	0.048	0.962	0.1134	1001	0.0074
VENEZUELA	0.17	5670	0.002	0.039	0.957	**0.109*****	0.038	0.007	**0.0003**	1235	0.0251
Medium IIT index											
COLOMBIA	0.27	7730	0.029	0.027	0.287	**0.084*****	0.028	0.003	**0.0026**	1138	0.0275
PANAMA	0.28	5040	-0.060	0.243	0.801	0.133	0.212	0.530	0.5962	458	0.0458
URUGUAY	0.32	8090	**-0.280***	0.162	0.088	-0.150	0.165	0.349	0.1496	1056	0.0049
GUATEMALA	0.32	4000	0.255	0.242	0.293	0.142	0.212	0.504	0.5647	467	0.0312
COSTA RICA	0.33	7880	**0.309***	0.172	0.072	**0.309***	0.184	0.093	0.1733	681	0.0094
SALVADOR	0.35	4670	**0.611*****	0.231	0.008	**0.837*****	0.217	0	**0.0004**	633	0.0319
High IIT index											
ARGENTINA	0.43	11010	0.091	0.211	0.667	0.211	0.213	0.321	0.3737	902	0.0064
BRAZIL	0.50	6580	-0.020	0.122	0.856	**0.370****	0.148	0.012	**0.0036**	1000	0.0147
MEXICO	0.61	7100	-0.140	0.178	0.421	0.103	0.177	0.561	**0.0078**	1282	0.0130
Total										14703	

Notes 1:
Education 2 (edu2)= secondary education level, which education years are between 7 to 12 years; Edu2 is a categorical variable equal to 1 if the respondent's highest level of education is secondary.
Education 3 (edu3) = tertiary education level, which education years are equal to and great than 13 years; Edu3 is a categorical variable equal to 1 if the respondent's highest level of education is tertiary.
The omitted category is primary education level, which education years are below 6 years.
Notes 2:
Marginal effects are reported for education variables only and based on the Probit model that includes control variables (but not reported here), which are: age, sex, marital, and family main wage earner. The dependent variable Y=1 if respondent support free trade and Y=0 otherwise. Thus a positive marginal effect coefficient implies a higher probability of support free trade.
Statistically significant see P values. Joint Test for education2 and education3, Ho: $\beta(edu2)=\beta(du3)=0$
Superscript"*", "**", and "***" separately represents statistically significant at less than 10%, 5%, 1% level.

Table 5A: The marginal effects of individual education levels on individual supports for free trade and interaction with IIT and GDP for pooled data of 17 countries in Latin America by using model (2) and (3)

Table 5 Pooled regression results from 17 countries in LA									
	Marginal Effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|
edu2	0.013	0.011	0.25	0.027	0.022	0.218	0.042	0.03	0.17
edu3	**0.071*** **	0.012	**0**	**0.084*** **	0.022	**0**	**0.101*** **	0.03	**0**
edu2*IIT				-0.08	0.074	0.254			
edu3*IIT				-0.09	0.073	0.241			
IIT				0.01	0.067	0.879			
edu2*GDP							0.000	0.000	0.16
edu3*GDP							0.000	0.000	0.15
GDP							**1E-05** **	0.000	**0.03**
Sex	**0.035*** **	0.007	**0**	**0.034*** **	0.007	**0**	**0.032*** **	0.007	**0**
age	-0	2E-04	0.87	2E-05	2E-04	0.941	-0	2E-04	0.75
Marital	-0	0.007	0.90	-0	0.007	0.675	-0	0.007	0.68
Finc	0.009	0.008	0.23	0.007	0.008	0.321	0.012	0.008	0.12
Joint test for edu2 and edu3, Ho: β(edu2)=β(du3)=0									
chi2(2)	chi2(2) = 73.08			chi2(2) = 24.26			chi2(2) = 15.88		
Prob> chi2	Prob > chi2 = 0.0000			Prob > chi2 = 0.0000			Prob> chi2 = 0.0004		
Observation	14703			14703			14703		
Pseudo R^2	0.007			0.008			0.008		
Country effect	Yes			No			No		

Notes:
z and P>|z| are the test of the underlying coefficient being 0

Superscript"*","**", and "***" separately represents statistically significant at less than 10%, 5%, 1% level.

Table 6A: The marginal effects of individual education levels on individual supports for free trade and interaction with Fm, Fx, and Eduindex from pooled data regression of 17 countries in Latin America by using model(3)

	Marginal effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|
edu2	-0.038	0.060	0.527	0.028	0.018	0.11	0.123	0.109	0.28
edu3	0.017	0.056	0.766	**0.086*** **	0.017	**0**	0.035	0.115	0.76
edu2*Fm	0.122	0.152	0.423						
edu3*Fm	0.126	0.146	0.388						
Fm	**-0.324****	0.129	**0.012**						
edu2*Fx				**-0.2***	0.119	**0.10**			
edu3*Fx				**-0.19***	0.117	**0.10**			
Fx				0	0.11	1			
edu2*ed~ex							-0.146	0.141	0.30
edu3*ed~ex							0.032	0.138	0.82
Eduindex							0.022	0.123	0.86
Sex	**0.032****	0.007	**0**	**0.035*****	0.007	**0**	**0.033*****	0.007	0
age	0	0.0002	0.969	-0	2E-04	0.95	2E-05	2E-04	0.93
Marital	-0.003	0.007	0.714	-0	0.007	0.74	-0.003	0.007	0.70
Finc	0.012	0.008	0.119	0.006	0.008	0.43	0.010	0.007	0.19
Joint test for edu2 and edu3, Ho: β(edu2)=β(du3)=0									
chi2(2)	1.67			**chi2(2) = 42.64**			chi2(2) = 1.88		
Prob> chi2	0.433			**Prob > chi2 = 0.0000**			Prob> chi2 = 0.3902		
Observation	14703			14703			14703		
Pseudo R^2	0.008			0.01			0.007		
Country effect	no			No			No		

Notes:
z and P>|z| are the test of the underlying coefficient being 0
Bold means at least 10% statistic significant
Superscript"*", "**", and "***" separately represents statistically significant at less than 10%, 5%, 1% level.
ed~ex = education index = education level of countries
According to the less Fm, the more support for free trade, the rank the countries for more to less supportive of free trade:
ARGENTINA;MEXICO;BRAZIL;PARAGUAY;CHILE;URUGUAY;VENEZUELA;COLOMBIA; ECUADOR;SPAIN;BOLIVIA;PERU;NICARAGUA;GUATEMALA;COSTA RICA;EL SALVADOR;
HONDURAS;PANAMA

Table 7A: The marginal effects of country characteristics on individual supports for free trade come from pooled data regression of 17 countries in Latin America by using model(3)

Table 7 country characteristics variable=X	Variable itself Marginal effects	X Robust Std. Err.	P>|z|	Joint test chi2(2)	Prob> chi2
GDP per capita, PPP (current international $)	**0.00001**	4.68E-06	**0.032**	17.01	**0.0002**
Gross foreign direct investment (% of GDP)	**0.01250**	0.00518	**0.016**	24.83	**0**
Unemployment, total (% of total labor force)	**0.00871**	0.00273	**0.001**	18.28	**0.0001**
Inflation, consumer prices (annual %)	**-0.00080**	0.00036	**0.027**	27.94	**0**
Urban population growth (annual %)	**-0.03353**	0.01074	**0.002**	11.64	**0.0030**
Urban population (% of total)	0.00094	0.00070	0.178	3.61	0.1641
Use of IMF credit (DOD, current US$)	-4.89E-12	3.42E-12	0.153	65.5	**0**
High-technology exports (current US$)	-4.03E-12	4.14E-12	0.330	67.68	**0**
School enrollment, tertiary (% gross)	0.00197	0.00123	0.110	7.21	**0.0273**
Trade (% of GDP)	0.00052	0.00040	0.196	22.68	**0**

note:
Pr(Y=1) =F (β1X+β2edu2+β3edu3+β4Xedu2+β5Xedu3+fixed variables) to estimate question P51: general free trade helps or harms nation's economy. z and P>|z| are the test of the underlying coefficient being 0; **Bold** means at least 10% statistic significant; observation=14703;
Joint test Ho: β (edu2) =β (du3) =0; Superscript"*", "**", and "***" separately represents statistically significant at less than 10%, 5%, 1% level.
The coefficient of edu2, edu3,Interaction (X*edu2, X*edu3) and fixed variable (age, sex, marital, and finc) do not report due to space constraint

Rank the countries for more to less supportive of free trade

Sorted by country characteristics	GDP	GFDI	Inflation	Unemployment	Urban Population growth
	Argentina	Chile	Argentina	Argentina	Uruguay
	Uruguay	Bolivia	Panama	Nicaragua	Argentina
Note:	Chile	Peru	Chile	Panama	Chile
Various ranking of top 5 countries to support free trade are: Argentina; Chile; Mexico; Panama; Venezuela	Mexico	Panama	El Salvador	Colombia	Mexico
	Costa Rica	Venezuela	Paraguay	Venezuela	Panama
	Brazil	Costa Rica	Guatemala	Ecuador	Brazil
	Colombia	Nicaragua	Peru	Paraguay	Venezuela
	Venezuela	Colombia	Nicaragua	El Salvador	Peru
	Panama	Argentina	Bolivia	Brazil	Colombia
	Paraguay	Mexico	Brazil	Peru	Ecuador
	Peru	Ecuador	Costa Rica	Costa Rica	Costa Rica
	El Salvador	Honduras	Colombia	Chile	Guatemala
	Guatemala	Brazil	Honduras	Mexico	Nicaragua
Bold countries means missing data, cannot be joined in rank.	Ecuador	Paraguay	Ecuador	Honduras	Bolivia
	Honduras	Uruguay	Uruguay	Bolivia	Paraguay
	Nicaragua	Guatemala	Mexico	**Uruguay**	El Salvador
	Bolivia	El Salvador	Venezuela	**Guatemala**	Honduras

Table 1B: Survey results of individual supports for free trade subject to education levels (P58 data for regional free trade)

Education	**Primary**	**Secondary**	**Tertiary**	**Total**
Oppose regional free trade	1109	4704	5846	11659
Row (percent)	9.51%	40.35%	50.14%	100%
Column (percent)	79.90%	83.45%	81.52%	**82.13%**
Support regional free trade	279	933	1325	2537
Row (percent)	11.00%	36.78%	52.23%	100%
Column (percent)	**20.10%**	**16.55%**	**18.48%**	**17.87%**
Total	1388	5637	7171	14196
Row (percent)	10.37%	40.73%	48.90%	100.00%
Pearson chi2 test for independence: 52.21				
Based on the survey question P58 " All things considered, would you say that [nation] benefits or not from its future links with [regional trading block]" I delete individuals who didn't answer question or said don't know from original data 18709 respondents and 14196 respondents left. Source: author calculations based on the 1996 Latinobarometro and pooled data from 17 countries in Latin America.				

Table 4B: the marginal effects of education levels on individual supports for regional free trade sorted by country degree of IIT by using P58 data for regional trade and using model (1)

Country	IIT	GDP	Education 2 Marginal effect	Std error	P>|z|	Education 3 Marginal effect	Std Error	P>|z|	Joint test Prob>chi2	Freq.	Pseudo R^2
Low IIT index											
PARAGUAY	0.05	5260	0.015	0.076	0.839	-0.030	0.073	0.676	0.599	247	0.020
BOLIVIA	0.06	2150	0.005	0.014	0.708	-0.010	0.014	0.658	0.609	328	0.099
NICARAGUA	0.06	2520	0.020	0.056	0.716	0.048	0.051	0.348	0.481	476	0.022
PERU	0.12	4260	-0.065	0.063	0.310	-0.030	0.064	0.632	0.399	475	0.058
ECUADOR	0.13	3140	0.001	0.034	0.984	0.016	0.040	0.686	0.862	696	0.006
HONDURAS	0.14	2800	-0.041	0.066	0.536	-0.110	0.066	0.111	0.179	400	0.017
CHILE	0.16	7090	-0.063	0.040	0.101	**-0.070***	0.035	**0.071**	0.186	509	0.020
VENEZUELA	0.17	5670	**0.138****	0.015	**0.013**	**0.083***	0.047	**0.085**	**0.034**	737	0.021
Medium IIT index											
COLOMBIA	0.27	7730	0.0146	0.0561	0.797	-0.010	0.053	0.910	0.8494	625	0.006
PANAMA	0.28	5040	0.0363	0.0677	0.591	0.114	0.083	0.132	0.1597	234	0.031
URUGUAY	0.32	8090	-0.0580	0.0416	0.175	-0.09	0.043	0.047	0.1359	603	0.015
GUATEMALA	0.32	4000	**0.993*****	0.003	**0**	**0.995*****	0.002	**0**	**0**	322	0.038
COSTA RICA	0.33	7880	**-0.119****	0.0572	**0.043**	-0.06	0.058	0.298	0.1099	356	0.024
SALVADOR	0.35	4670	**-0.144***	0.0807	**0.082**	**-0.18****	0.083	**0.029**	**0.0888**	343	0.03
High IIT index											
ARGENTINA	0.43	11010	-0.044	0.0529	0.419	-0.03	0.054	0.556	0.7029	501	0.019
BRAZIL	0.50	6580	0.0013	0.034	0.971	0.017	0.034	0.619	0.8168	561	0.021
MEXICO	0.61	7100	-0.046	0.0462	0.324	-0.04	0.047	0.413	0.6145	612	0.012
Total										8025	

Notes 1:
Based on the survey question P58 " All things considered, would you say that [nation] benefits or not from its future links with [regional trading block]"
Education 2 (edu2)= secondary education level, which education years are between 7 to 12 years; Edu2 is a categorical variable equal to 1 if the respondent's highest level of education is secondary.
Education 3 (edu3) = tertiary education level, which education years are equal and great than 13 years; Edu3 is a categorical variable equal to 1 if the respondent's highest level of education is tertiary.
The omitted category is primary education level, which education years are below 6 years.
Notes 2:
Marginal effects are reported for education variables only and based on the Probit model that includes control variables (but not reported here), which are: age, sex, marital, and family main wage earner. The dependent variable Y=1 if respondent support free trade and Y=0 otherwise. Thus a positive marginal effect coefficient implies a higher probability of support free trade.
Statistically significant see P values. Joint Test for education2 and education3, Ho: $\beta(edu2)=\beta(du3)=0$
Superscript"*", "**", and "***" separately represents statistically significant at less than 10%, 5%, 1% level.

Table 5B: The marginal effects of individual education levels on individual supports for *regional* free trade and interaction with IIT and GDP from pooled data regression of 17 countries in Latin America by using model (2) and (3)

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	Marginal effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|
edu2	-0.013	0.015	0.385	-0.013	0.026	0.626	**0.103****	0.044	0.017
edu3	-0.019	0.015	0.198	0.020	0.025	0.431	**0.090****	0.042	0.033
edu2*IIT				-0.016	0.080	0.845			
edu3*IIT				-0.032	0.078	0.683			
IIT				0.093	0.070	0.183			
edu2*GDP							**-0*****	0	0.002
edu3*GDP							**-0*****	0	0.033
GDP							**3E-05*****	0	0
Sex	-0.005	0.011	0.626	0.0005	0.011	0.964	-0	0.011	0.946
age	**0.0006**	3E-04	0.068	0.0003	3E-04	0.390	2E-04	3E-04	0.427
Marital	Collinearity			Collinearity			Collinearity		
Finc	**0.0254**	0.011	0.017	0.0183	0.011	0.09	**0.018**	0.011	0.1
Joint test for edu2 and edu3, Ho: β(edu2)=β(du3)=0									
chi2(2)	1.73			Chi2(2) = 4.07			chi2(2) = 5.79		
Prob> chi2	0.4217			Prob > chi2 = 0.1308			**Prob> chi2 = 0.0552**		
Observation	8025			8025			8025		
Pseudo R^2	0.1991			0.0029			0.013		
Country effect	Yes			No			No		

Notes:
Based on the survey question P58 " All things considered, would you say that [nation] benefits or not from its future links with [regional trading block]"

Bold means at least 10% statistic significant

z and P>|z| are the test of the underlying coefficient being 0

Superscript"*","**", and "***" separately represents statistically significant at less than 10%, 5%, 1% level.

Table 6B The marginal effects of individual education levels on individual supports for *regional* free trade as well as interaction with Fm Fx and eduindex from pooled data regression of 17 countries in Latin America by using model (3)

	Marginal effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|
edu2	0.0028	0.0713	0.968	-0.005	0.016	0.77	0.271	0.176	0.111
edu3	0.0286	0.0718	0.690	**0.0371****	0.016	0.02	0.156	0.162	0.333
edu2*Fm	-0.0514	0.1805	0.776						
edu3*Fm	-0.0430	0.1806	0.812						
Fm	-0.0679	0.1599	0.671						
edu2*Fx				**-0.113***	0.061	0.06			
edu3*Fx				**-0.261*****	0.059	0			
Fx				**2E-05*****	0	0			
edu2*ed~ex							**-0.330***	0.191	0.084
edu3*ed~ex							-0.170	0.187	0.358
Eduindex							-0.120	0.174	0.491
Sex	0.0013	0.0108	0.905	-7E-04	0.011	0.95	0.001	0.011	0.892
age	0.0003	0.0003	0.377	0.0002	3E-04	0.45	3E-04	3E-04	0.31
Marital									
Finc	**0.0181***	0.0107	0.093	0.0166	0.011	0.13	**0.018***	0.011	0.084
Joint test for edu2 and edu3, Ho: β(edu2)=β(du3)=0									
chi2(2)	0.3500			chi2(2) = 11.28			chi2(2) = 3.05		
Prob> chi2	0.8386			**Prob > chi2 = 0.0036**			Prob> chi2 = 0.2174		
Observation	8025			8025			8025		
Pseudo R^2	0.0024			0.0142			0.008		
Country effect	No			No			No		

Notes:
Based on the survey question P58 " All things considered, would you say that [nation] benefits or not from its future links with [regional trading block]"

z and P>|z| are the test of the underlying coefficient being 0

Bold means at least 10% statistic significant
ed~ex = education index = education level of countries

Superscript"*","**", and "***" separately represents statistically significant at less than 10%, 5%, 1% level.

Table 7B: The marginal effects of country characteristics on individual supports for regional free trade come from pooled data regression of 17 countries in Latin America by using model(3)

Table 7B	Variable X itself			Joint test	
X=country characteristic variables	Marginal effects	Robust Std. Err.	P>|z|	chi2(2)	Prob> chi2
Urban population growth (annual %)	**0.02728**	0.01395	**0.051**	3.46	0.1769
GDP per capita, PPP (current international $)	**1.35E-05**	5.95E-06	**0.024**	7.22	**0.0270**
School enrollment, tertiary (% gross)	**-0.00296**	0.00167	**0.077**	5.29	**0.0710**
Inflation, consumer prices (annual %)	**-0.00129**	0.00060	**0.032**	18.37	**0.0001**
Trade (% of GDP)	-0.00018	0.00054	0.740	12.77	**0.0017**
Unemployment, total (% of total labor force)	0.00243	0.00363	0.502	4.79	**0.0913**
Urban population (% of total)	-9.3E-05	0.00096	0.923	2.68	0.2613
Use of IMF credit (DOD, current US$)	-5.91E-12	4.20E-12	0.159	12.75	**0.0017**
Gross foreign direct investment (% of GDP)	-0.00464	0.00690	0.501	1.46	0.4824
High-technology exports (current US$)	-3.59E-12	4.87E-12	0.461	10.18	**0.0062**

note:
Pr(Y=1) =F (β1X+β2edu2+β3edu3+β4Xedu2+β5Xedu3+fixed variables) to estimate question P58: regional free trade benefits or not nation's economy. observation=8025
Joint test Ho: β(edu2)=β(du3)=0; z and P>|z| are the test of the underlying coefficient being 0
Bold means at least 10% statistic significant; Superscript"*", "**", and "***" separately represents statistically significant at less than 10%, 5%, 1% level.
The coefficient of edu2, edu3,Interaction (X*edu2, X*edu3) and fixed variable (age, sex, marital, and finc) do not report due to space constraint

Rank the countries for more to less supportive of regional free trade

	GDP	School enrollment Tertiary	Inflation
Note:	Argentina	Guatemala	Argentina
Top 5 countries supporting regional free trade in the ranking of the effect of GDP are: Argentina; Uruguay Chile; Mexico; Costa Rica	Uruguay	Paraguay	Panama
	Chile	Honduras	Chile
	Mexico	Nicaragua	El Salvador
	Costa Rica	Brazil	Paraguay
	Brazil	Mexico	Guatemala
	Colombia	Colombia	Peru
	Venezuela	El Salvador	Nicaragua
	Panama	Ecuador	Bolivia
	Paraguay	Bolivia	Brazil
	Peru	Peru	Costa Rica
	El Salvador	Venezuela	Colombia
	Guatemala	Uruguay	Honduras
	Ecuador	Chile	Ecuador
	Honduras	Costa Rica	Uruguay
	Nicaragua	Panama	Mexico
	Bolivia	Argentina	Venezuela

Table 4C: The marginal effects of education levels on individual supports for free trade sorted by country degree of IIT after education endogeneity problem correction by using model (1)

Country	IIT	GDP pc in 1996	Education hat marginal effects	Robust std error	P>|z|	Freq-uency	Pseudo R2
PARAGUAY	0.05	5260	0.03575	0.02620	0.172	203	0.0315
BOLIVIA	0.06	2150	**0.02660***	**0.01464**	**0.070**	410	0.0331
NICARAGUA	0.06	2520	0.00749	0.01130	0.509	391	0.0029
PERU	0.12	4260	0.01039	0.01354	0.443	525	0.0122
ECUADOR	0.13	3140	**0.01970****	**0.00970**	**0.042**	910	0.0159
HONDURAS	0.14	2800	**0.03030***	**0.01763**	**0.086**	343	0.0089
CHILE	0.16	7090	**0.02120***	**0.01190**	**0.077**	563	0.0127
VENEZUELA	0.17	5670	-0.00524	0.01360	0.700	559	0.0194
COLOMBIA	0.27	7730	0.01310	0.00870	0.134	572	0.0291
PANAMA	0.28	5040	-0.00060	0.01200	0.959	266	0.0214
URUGUAY	0.32	8090	**-0.02580****	**0.01310**	**0.050**	585	0.0085
GUATEMALA	0.33	4000	**-0.05750***	**0.02960**	**0.053**	149	0.0365
COSTA RICA	0.33	7880	0.01874	0.01510	0.215	323	0.0133
SALVADOR	0.35	4670	**0.05900*****	**0.02046**	**0.004**	215	0.0617
ARGENTINA	0.43	11010	0.00999	0.01550	0.519	474	0.0085
BRAZIL	0.50	6580	0.00729	0.01200	0.543	567	0.0059
MEXICO	0.61	7100	0.01124	0.01258	0.371	691	0.0076

Notes:
Education endogeneity test is using Hausman test

Education endogeneity correction is using father education as instrument variable to estimate education hat, which equals to eduhat.

Superscript"*","**", and "***" separately represents statistically significant at less than 10%, 5%, 1% level.

Table 5C: The marginal effects of individual education levels on individual supports for free trade and interaction with IIT and GDP as well as education endogeneity problem correction for pooled data regression of 17 countries in Latin America by using model (2) and (3)

	Marginal effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|
Eduhat	**0.0105*** **	0.0033	**0.002**	**0.0216*** **	0.006	**0**	**0.029*** **	0.007	**0**
eduhat*IIT				**-0.0313***	0.017	**0.06**			
IIT				0.2759	0.200	0.17			
eduhat*GDP							**0****	0	**0.02**
GDP							**4E-05*** **	1E-05	**0.01**
Sex	**0.0336*** **	0.0104	**0.001**	**0.0344*** **	0.010	**0**	**0.036*** **	0.01	**0**
age	0.0004	0.0004	0.246	**0.0006***	4E-04	**0.10**	6E-04	4E-04	0.13
Marital	-0.0130	0.0110	0.238	-0.0098	0.011	0.37	-0.01	0.011	0.38
Finc	-0.0020	0.0389	0.968	-0.0019	0.015	0.90	**0.024***	0.014	**0.10**
Observation			7746			7746			7746
Pseudo R^2			0.0319			0.0068			0.0063
Country effect	Yes			No			No		

Notes:

z and P>|z| are the test of the underlying coefficient being 0Superscript"*","**", and "***" separately represents statistically significant at less than 10%, 5%, 1% level.

Education endogeneity test is using Hausman test

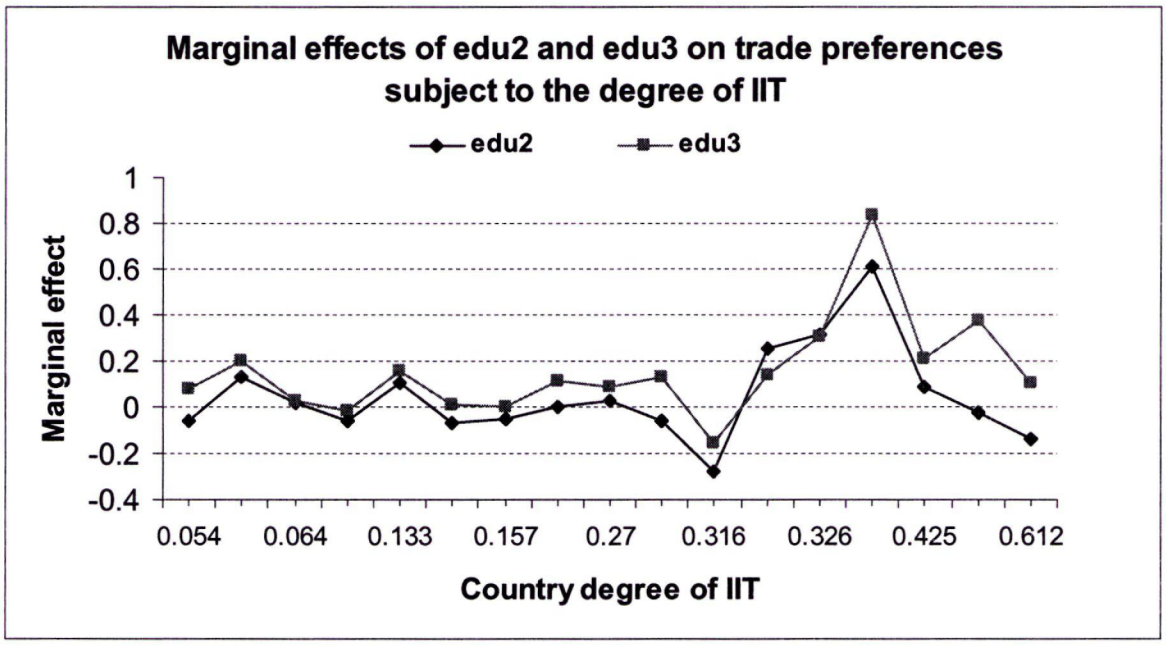
Education endogeneity correction is using father education as instrument variable to estimate education hat, which equals to eduhat.

Table 6C: The marginal effects of education levels on individual supports for free trade and interaction with Fm, Fx, and education index with education *endogeneity* problem correction from pooled data regression of 17 countries in Latin America by using model(3)

	Marginal effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|	Marginal effects	Robust Std. Err.	P>|z|
Eduhat	**0.0301****	0.0143	**0.035**	**0.0136*****	0.004	**0**	0.046	0.031	0.14
eduhat*Fm	-0.0430	0.0359	0.234						
Fm	0.2875	0.4165	0.490						
eduhat*Fx				-0.0031	0.023	0.89			
Fx				-0.1932	0.279	0.49			
eduhat*ed~x							-0.038	0.036	0.29
Eduindex							0.552	0.425	0.19
Sex	**0.0331*****	0.0105	**0.002**	**0.0348*****	0.010	**0**	**0.035*****	0.010	0
age	**0.0006***	0.0004	**0.097**	0.0006	4E-04	0.12	**6E-04***	4E-04	0.10
Marital	-0.009	0.0110	0.408	-0.0098	0.011	0.37	-0.009	0.011	0.40
Finc	0.015	0.0136	0.276	-0.0125	0.015	0.40	0.010	0.014	0.45
Observation			7746			7746			7746
Pseudo R^2			0.0063			0.0091			0.0055
Country effect	No			No			No		

Notes:
ed~ex = education index = education level of countries
Education endogeneity test is using Hausman test
Education endogeneity correction is using father education as instrument variable to estimate education hat, which equals to eduhat.
z and P>|z| are the test of the underlying coefficient being 0
Superscript"*","**", and "***" separately represents statistically
Significant at less than 10%, 5%, 1% level.

Graph 2: The marginal effects of secondary education (edu2) and tertiary education (edu3) on individual trade preference against country IIT level for general free trade.



From graph, there are no obvious relationship between marginal effects of individual education level on individual trade preferences and country IIT index for general free trade.

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