

# Determinants of Latin America's Overreliance on International Trade Taxation

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## Abstract

This paper investigates the determinants of Latin America's overreliance on international trade taxation as a source of governmental revenue. Latin America, more than any other region of the world relies on international trade taxation as a source for governmental revenue. A number of hypotheses are tested including ordinary least squares regressions of the effect of income inequality on the extent to which a country relies on international trade taxation as a source of governmental revenue. It is hypothesized that countries with high levels of income inequality have difficulty collecting income taxes and accordingly disproportionately rely on international trade taxation. The analysis indicates that there is a statistically significant correlation between Latin America's high levels of income inequality and its reliance on international trade taxation as a source of governmental revenue. As a consequence of Latin America's excessive reliance on international trade taxes further trade liberalization in the region will be unlikely.

**Keywords:** Latin American taxation, Trade taxation, Tariffs

## 1. Introduction

Latin America today suffers from a number of interrelated maladies. Its growth rate and its GDP per capita are low while its income inequality and its poverty rate are high. Its governments almost without exception collect insufficient amounts of tax revenue. This leads to insufficient governmental spending, especially on such vitally important areas as investment in physical infrastructure as well as education and health care. In spite of low expenditures Latin America still has excessive governmental debt which leads to greater interest expenditures and further restrictions on government spending. The governments of Latin America, also almost without exception rely too heavily on international trade taxes to provide governmental revenue. Further trade liberalization, in spite of its many benefits will be extremely difficult as a result of the above mentioned combination of factors.

The purpose of this paper is to test a number of hypotheses. The first four hypotheses relate to whether or not there are statistically significant and meaningful differences between Latin American and Eastern and Central Europe with respect to 1) reliance on international trade taxes, 2) governmental expenditures, 3) governmental indebtedness and 4) income inequality. The countries of Eastern and Central Europe provide a useful comparison to Latin America as a result of the two regions many similarities. Latin America and Eastern and Central Europe are at the same general level of economic development. Further they share many similarities with respect to religion and demographics. I expect there to be statistically significant and meaningful differences between the two regions.

The fifth and final hypothesis tested is a test of the hypothesis that the level of income inequality in a country affects its reliance on international trade taxes for revenue. In other words, do countries with higher Gini coefficients have higher trade tax to total tax ratios? I expect that countries with higher levels of income inequality will indeed rely more heavily on trade tax revenue. Such a finding will be in support of the theory outlined in this paper.

Revenues derived from tariffs play an especially important function in financing infant governments (Sawyer & Sprinkle, 2004). While trade taxes have been reduced significantly in recent years they still amount to over one quarter of all governmental revenue in low income countries (Baunsgaard & Keen, 2005) and a lower but by no means insignificant percentage in middle income countries. International trade taxes are still a significant source of revenue for the governments of most Latin American states (Stotsky & WoldeMariam, 2004).

Latin America already suffers from a dearth of governmental revenues. Measured as a percentage of GDP, Latin America collects the lowest percentage of total tax, the lowest percentage of personal income tax and the lowest percentage of corporate income tax, of any region in the world (Tanzi & Zee, 2000). Further, such low tax collection has persisted for decades (Todaro & Smith, 2006). Although there is great pressure applied to Latin American governments to reform their tax systems and secure greatly needed additional revenue, they have proven, for a variety of reasons to be unable to do so (Tanzi, 2000). Low and middle income countries have, for the most part been unable to replace revenues lost as the result of tariff reductions (Baunsgaard & Keen, 2005).

Although the benefits of free trade are well known and trade liberalization is popular among Latin American governments and the Latin American public (Baker, 2003), further trade liberalization is simply not affordable by most governments in the region.

## 2. Review of the Related Literature

While trade taxes, fees and levies collected on imports and exports, have been reduced significantly over the last few years they still amount to over one quarter of all governmental revenue in low income countries (Baunsgaard & Keen, 2005) and a lower but by no means insignificant percentage in middle income countries. Stotsky & WoldeMariam (2004) concur that international trade taxes are still a significant source of revenue for the governments of most Latin American states. The range of international trade taxes to total governmental tax revenues in Latin America was at the end of the 1990's, according to Stotsky and WoldeMariam (2004) from a low of about 3% to a high of over 45% while the un-weighted regional average was 21.1%. Reliance on international trade taxes is even higher in some of the smaller Caribbean countries with many deriving the majority of tax revenue from such levies (Peters, 2002).

### 2.1 Tax Effort

The governments of Latin America are, with few exceptions, dealing with the problem of low tax effort. Tax effort is defined as total tax revenue collected, divided by GDP. Low tax effort is the phenomenon of a government collecting an insufficient amount of tax revenue; it is a problem which plagues many developing countries, especially those in Latin America (Bird, Martinex-Vazquez & Torgler, 2008). Low tax effort was recognized as a factor in underdevelopment many years ago. Nicholas Kaldor in 1963 asked the question "will underdeveloped countries learn to tax?" (Bird, Martinex-Vazquez & Torgler, 2008, 56). Kaldor contended that poor countries needed to collect much more in taxes than the 10 – 15 percent of GDP that they normally collected. The same issue persists to this day, Mexico as an example, had a tax ratio of 10.2 % in 2004 a less than impressive improvement from its 10.1 % ratio in 1980 (Bird, Martinex-Vazquez & Torgler, 2008). By way of comparison, developed countries collect much more in tax revenue measured as a percentage of GDP. Mexico collects about half the OECD tax to GDP average (OECD, 2014) and it is by no means atypical in Latin America. Further, the low tax effort has persisted for many years in spite of efforts to remedy the problem. Governments in the region have undertaken many efforts at tax reform and impose many different types of taxes yet the tax effort barely budges and there are even some indications that it has declined somewhat (Bird, Martinez-Vazquez, & Torgler, 2004). Solano (2003) contends it is not simply a matter of developmental status either since lesser developed countries in other regions of the world manage to collect more tax. Latin American countries consistently under collect taxes compared to other developing countries of the world (Bird, Martinex-Vazquez & Torgler, 2008).

Greater tax effort is needed not only to pay for ongoing governmental operations, but also the governments of Latin America need to increase their tax collection efforts in order to remedy a serious underinvestment in physical infrastructure. Poor, or in some cases non-existent infrastructure has a significant adverse effect on Latin Americas potential for future economic growth (de Mello, 2006). Inadequate infrastructure may be partially to blame for what Edwards (2007) calls mediocre economic performance. Indeed, compared to other regions of the world based on annual growth in real GDP per capita, Edwards may have been too generous. Bird, Martinex-Vazquez and Torgler (2008) concur that developing countries need to spend more on basic infrastructure. Santiso (2007) concludes that Latin American needs to significantly increase its investment in infrastructure in order to take advantage of trade opportunities. He points to Mexico, relatively developed by Latin American standards, as needing "better roads, ports, railways and airports" (Santiso, 2007, 14).

### 2.2 Trade Liberalization

Trade liberalization has had a dramatic and adverse effect on governmental tax revenues in low and middle income countries (Baunsgaard & Keen, 2005). The authors in an empirical study of 111 countries over 25 years concluded that middle income countries were able to replace 45 to 60 percent of revenues lost as a result of trade liberalization. Low income countries were able to replace only about 30 percent of lost revenue. High income countries on the other hand

had no trouble replacing revenues lost as a result of trade liberalization as they were able to make up any shortfall by increasing other taxes (Baunsgaard & Keen, 2005). Khattry and Rao also concluded that developing countries experienced declines in their tax to GDP ratios as a result of decreases in tariff revenue after analyzing the tax revenue collections of 80 countries over a 29 year period (Khattry & Rao, 2002). For a multitude of reasons developing countries find it difficult to collect adequate tax revenues. Other researchers conclude much the same thing (Peters, 2002) and (Khattry, 2003), although some (Agbeyegbe, 2006) contend otherwise.

When Latin American countries already suffering from low tax effort reduce tariffs, they need to make up the revenue from another source. In theory it is easy to accomplish (Agbeyegbe, 2006), (Keen & Lighthart, 2002), (Keen & Lighthart, 2005) and (Mujumdar, 2004). After all if you reduce a tax like tariffs, simply increase another type of tax to make up the shortfall. However as Hindriks, Keen and Muthoo (1999, 395) reminded us “tax revenue does not collect itself.” The vast majority of Latin American governments have great difficulty collecting tax revenue. As Tanzi and Zee (2000, 300) put it: in developing countries’ ”tax policy is often the art of the possible rather than the pursuit of the optimal.” Bhagwati, Greenaway and Panagariya (1998) theorize that an overall welfare loss to trade liberalization is possible if the tariff revenue losses exceed the gains from additional trade. That is what appears to be happening in Latin America. Under such circumstances further trade liberalization becomes detrimental.

### **3. Theory**

Latin America has the highest average level of income inequality in the world (Edwards, 2007) and (Todaro & Smith, 2006). Its income inequality is not only high but persistent as well. Indeed it has remained remarkably consistent throughout Latin America over the last half century (Perry, Arias, Lopez, Maloney and Serven, 2006). Income inequality has a number of negative effects on a society. Among the most detrimental is that it leads to economic inefficiency (Todaro & Smith, 2006) and constrains growth (Birdsall, Pinckney & Sabot, 1996) and (Perry, Arias, Lopez, Maloney & Serven, 2006). Perhaps even more insidious is the social schism created by high income inequality between the haves and the have not’s.

#### *3.1 Social Contract*

An implied social contract is necessary for a properly functioning tax system (Bird, Martinez-Vazquez and Toggler, 2008). The absence of such a social contract makes taxation extremely difficult in Latin America. Sandmo (2005) maintains that taxpayers are motivated by their perceptions of fairness and that tax evasion is a social phenomenon. Gueth and Sausgruber (2004) concur, contending tax compliance is dependent upon social motives and social duty. Nobody likes to pay tax and those who can avoid paying taxes will tend to do so (Slemrod, 1990). In countries with extreme income inequality, the wealthy and the high income are well positioned to “avoid the full impact of the tax system” (Bird & Wallace, 2003). In Latin America it is generally understood that the rich do not pay taxes (Reid, 2007).

Vito Tanzi (2000) contends that Latin America is simply unable to collect income taxes. Unfortunately the public finances of most countries are dependent upon income taxes. Latin America’s inability to collect income taxes forces it to rely on other less efficient forms of taxation such as the easy to collect international trade taxes. Some scholars maintain that paying taxes is not in the narrow personal interests of the wealthy (Bird, Martinez-Vazquez & Toggler, 2008). Khattry and Rao (2002) are of the view that the wealthy and high income in Latin America are able to simply exempt themselves from taxation, a view shared by Tanzi and Zee (2000) who contend that wealthy and high income taxpayers can easily circumvent tax laws in Latin America. This would explain the phenomenon of Latin America collecting little income tax in spite of having the highest income tax rates in the world (World Bank, 2008). Hindriks, Keen, and Muthoo (1999) find regressive effects of widespread tax evasion in the region. All of this results in what is essentially a tragedy of the commons.

In summary, high income inequality in a nation leads to widespread income tax evasion which in turn forces governments to excessively rely on such easily collected taxes as taxes on international trade. Accordingly, countries with greater amounts of income inequality should be more reliant on international trade taxes.

### **4. Data Analysis**

A number of sources provided data utilized in this analysis. Those sources are described in detail below. Data was obtained regarding most of the major countries of Latin America. Those countries consisted of: Argentina, Belize, Bolivia, Brazil, Chile, Columbia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. Additional data was collected from countries in Central and Eastern Europe. The countries in that region of the world make for a useful comparison with Latin America since they are of roughly the same level of development. Data was collected about the following Central and Eastern European

countries: Albania, Armenia, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, Moldavia, Poland, Romania, Serbia, Slovak Republic, Slovenia and Ukraine.

#### *4.1 Bivariate Regression Variables*

International trade taxes represent collections from the imposition of tax on imports. International trade taxes are expressed as a percentage of total tax revenue collections. The percentage is based on data collected from the International Monetary Fund's Government Finance Statistics Yearbook 2007 (IMF, 2008). International trade taxes were used in a t test of independent means as well as Bivariate and Multivariate regressions.

Governmental expenditures represent total annual government spending expressed as a percentage of GDP. The total of Governmental expenditures was taken from the World Bank's Data and Statistics Country at a Glance Tables. Also taken from the World Bank's Data and Statistics Country at a Glance Tables was the variable Governmental debt. Governmental debt is expressed as a percentage of total exports. Governmental expenditures and Governmental debt were both used in t tests of independent samples.

#### *4.2 Ordinary Least Squares Regression Variables*

The dependent variable used in the multiple regression Ordinary Least Squares analysis is the percentage of total tax revenues collected from international trade taxes. The dependent variable is based on data collected from the International Monetary Fund's Government Finance Statistics Yearbook 2007 (IMF, 2008). It is a direct measure of the extent to which a government relies on trade taxes to finance governmental budgets.

The main independent variable, the Gini coefficient was obtained from the Inter-American Development Bank's DataGov Governance Indicators database (DataGov, 2014). DataGov in turn, obtained the data from the World Bank World Development Indicators. Higher Gini coefficients mean that there is a greater the amount of income inequality in a country.

Literacy is another independent variable used in the analysis. The literacy variable was obtained from the Inter-American Development Bank's DataGov Governance Indicators database (DataGov, 2014). DataGov obtained the data from the World Bank World Development Indicators. Literacy represents the percentage of the population aged 15 and higher who can read and write. Literacy is used as a control variable since it is thought by some (Slemrod, 1995) to be correlated with a high reliance on trade taxes. Another of independent variables used in the OLS regression is Income Tax. Income Tax represents the percentage of total tax revenue collected from income tax levies divided by GDP. This variable is based on data collected from the International Monetary Fund's Government Finance Statistics Yearbook 2007 (IMF, 2008). It is a direct measure of the extent to which a government relies on income taxes to finance governmental budgets. The Income Tax variable is used as a control variable. It is thought that countries with the administrative capacity and political will to enforce an income tax will be less reliant on international trade taxes (Tanzi & Zee, 2000). Trade openness is another of the independent variables. It is defined as exports plus imports divided by GDP. Trade openness was obtained from the Inter-American Development Bank's DataGov Governance Indicators database (DataGov, 2014). DataGov obtained the data from the World Bank World Development Indicators. Trade Openness is being used as a control variable since other researchers have found correlations between it and the reliance on tariff revenue (Khatty & Rao, 2002) and (Baunsgaard & Keen, 2005). Inflation is another of the independent variables. This variable is the average of the most recent five years rates of inflation. Inflation was obtained from the Inter-American Development Bank's DataGov Governance Indicators database (DataGov, 2014). DataGov obtained the data from the World Bank World Development Indicators. Inflation is another control variable, it is being used because other researchers have found evidence of it being correlated with the dependent variable (Baunsgaard & Keen, 2005). The final independent variable is Agriculture. The Agriculture variable represents the percentage of GDP which results from the agricultural sector. It was obtained from the World Bank's Data and Statistics Country at a Glance Tables. Agriculture is being used as a control variable. It is thought by some researchers to be correlated with the extent to which a country relies on tariff revenue (Khatty & Rao, 2002) and (Baunsgaard & Keen, 2005).

The objective of this paper is to test a number of hypotheses. The first four relate to whether or not there are statistically significant and meaningful differences between Latin American and Eastern and Central Europe with respect to 1) reliance on international trade taxes, 2) governmental expenditures, 3) governmental indebtedness and 4) income inequality. The fifth and final hypothesis tested is a test of the hypothesis that the level of income inequality in a country affects its reliance on international trade taxes for revenue. In other words, do countries with higher Gini coefficients have higher trade tax to total tax ratios? I expect that countries with higher levels of income inequality will indeed rely more heavily on trade tax revenue. Such a finding will be in support of the theory outlined in this paper.

### 4.3 Hypotheses

#### **Statement of Null and Research (Alternative) Hypotheses:**

**H<sub>0-1</sub>:** There is no difference in level of international trade taxes between Latin America and Eastern and Central Europe.

**H<sub>1-1</sub>:** International trade taxes as a percentage of total taxes are higher in Latin America than they are in Eastern and Central Europe.

**H<sub>0-2</sub>:** There is no difference in level of government spending between Latin America and Eastern and Central Europe.

**H<sub>1-2</sub>:** Government spending is lower in Latin America than it is in Eastern and Central Europe.

**H<sub>0-3</sub>:** There is no difference in level of government debt between Latin America and Eastern and Central Europe.

**H<sub>1-3</sub>:** Government debt is higher in Latin America than it is in Eastern and Central Europe.

**H<sub>0-4</sub>:** There is no difference in income inequality between Latin America and Eastern and Central Europe.

**H<sub>1-4</sub>:** Income inequality is higher in Latin America than it is in Eastern and Central Europe.

**H<sub>0-5</sub>:** There is not a relationship (no correlation) between the level of income inequality in a country and its reliance on international trade taxes.

**H<sub>1-5</sub>:** There is a relationship (positive correlation) between the level of income inequality in a country and its reliance on international trade taxes.

Dependent variable: Trade taxes as a percentage of total taxes collected

Main Independent variable: Gini coefficient

Other Independent variables:

Literacy	Inflation
Income Tax Revenue	Agriculture
Trade Openness	

### 5. Statistical Methods and Results of Analysis

T tests of independent means were performed in order to test the first four hypotheses. Table 1 displays the results of those tests. As indicated all of the t tests resulted in meaningful as well as statistically significant differences. Accordingly, support exists for the first four research hypotheses. In summary, the countries of Latin America rely more on international trade taxes, have lower levels of governmental spending, have incurred greater amounts of government indebtedness and have greater income inequality than do the countries of Eastern and Central Europe.

Table 1. T Test of Independent Means

Test	Latin America Mean	East/Central Europe Mean	Mean Difference	sig.	
Trade Taxes	9.3653	2.6209	6.74443	0.000 (4.433)	*
Government Spending	20.6429	31.0588	-10.41597	0.000 (4.543)	*
Government Debt	163.6576	95.7100	67.94765	0.005 (2.998)	*
Gini	51.9518	30.7276	21.22412	0.000 (13.185)	*

Note. T - Values are in parentheses.

\*Significant at the .01 level.

### 5.1 Bivariate Regression

A Bivariate regression was run to determine the correlation between Gini coefficients, the main independent variable and trade taxation, the dependent variable. Bivariate regressions were also run comparing all of the other independent variables to the dependent variable tax effort. Table 2 shows the results of the regressions. A statistically significant correlation was found between the main independent variable and the dependent variable. In other words, the extent to which a country relies on international trade taxation is dependent upon the level of income inequality in that country. This result is not only statistically significant at the .01 level, but meaningful as well. Indeed the main independent variable has at .695 the largest correlation of any of the independent variables. The obtained result is also in accordance with the prediction of the theory outlined in the paper. Several of the other independent variables were meaningful and achieved the level of statistical significance when compared with the dependent variable as well.

Table 2. Bivariate Regressions of the Impact of the Independent Variables on the level of Dependent Variable

Independent Variable	Pearson Correlation	sig. (2 - tailed)
Gini	0.695	0.000
Literacy	-0.331	0.074
Income Taxes	-0.482	0.023
Trade Openness	-0.383	0.028
Inflation	0.170	0.344
Agriculture	0.028	0.896

### 5.2 Ordinary Least Squares Regression

Additionally, an ordinary least squares (OLS) regression analysis was performed in order to test the hypothesis that there is a relationship between the income inequality and reliance on international trade taxes. Regression analysis was performed on the following model:

$$TRADETAX = \alpha + \beta_1 GINI_i + \beta_2 LIT_i + \beta_3 INCTAX_i + \beta_4 TROPEN_i + \beta_5 INF_i + \beta_6 AG_i + \varepsilon_i$$

Where:

*TRADETAX* is the percentage of governmental revenue raised through international trade taxes.

*GINI* is the Gini Co-efficient, a measure of income inequality.

*LIT* represents the percentage of adults who are literate.

*INCTAX* is income tax collected as a percentage of GDP.

*TROPEN* is the Trade Openness (Exports plus Imports divided by GDP) of the country.

*INF* represents annual inflation.

*AG* is agriculture's percentage of the economy.

$\varepsilon$  represents unobserved factors. It also includes the error term.

The results of the regression analysis are displayed in Table 3. Table 4 shows the descriptive statistics associated with the variables. Overall the independent variables explain seventy-eight (78) percent of the variation in reliance on trade taxation. Table 3 shows the mean, b score, standard error and t value for each of the independent variables. As the results clearly indicate there is a strong correlation between the model and dependent variable. The result is consistent with and supports the theory as outlined in the paper. Considering the robust statistical significance as well as the meaningfulness of the results, the Null Hypotheses must be rejected and the alternative or research Hypotheses accepted for the fifth and final hypotheses.

Table 3. Multivariate Regression of the Impact of the Independent Variables on the Dependent Variable

Independent Variable	mean	b	Se	
Gini	41.3397	0.092	0.087	**
			(0.411)	
Literacy	92.7900	-0.177	0.141	
			- (0.838)	
Income Tax	5.7645	-0.438	0.281	
			- (2.361)	
Trade Openness	87.8872	-0.138	0.023	*
			- (0.797)	
Inflation	7.7072	0.635	0.178	
			(3.937)	
Agriculture	9.0556	-0.201	0.138	
			- (1.267)	
Constant		17.894		
N		36		
Adjusted R Square		0.782		

Note: T - Values are in parentheses.

\*Significant at the .05 level.

\*\* Significant at the .10 level.

Table 4. Descriptive Statistics

Variable	Maximum	Minimum	Standard	Skewness	Kurtosis	Deviation
Trade Tax	23.84		0.10	5.39	1.31	2.49
Gini	58.45		24.44	11.55	0.06	-1.58
Literacy	99.77		69.10	7.96	-1.43	1.35
Income Tax	10.60		0.16	2.64	0.02	-0.49
Trade Openness	162.34		37.62	34.56	0.55	-0.67
Inflation	19.30		1.90	4.53	1.73	2.91
Agriculture	19.80		3.90	4.50	0.98	0.22

## 6. Conclusion

As the results of this analysis clearly indicate, the countries of Latin America are more dependent upon international trade taxation than are the countries of Eastern and Central Europe. The governments of Latin America also spend less and are more indebted than are the governments of Eastern and Central Europe. Additionally, Latin America has more income inequality than does Eastern and Central Europe. The analysis also indicates that there is a strong correlation between Latin America's excessive reliance on international trade taxes and its high levels of income inequality.

As a consequence of Latin America's excessive reliance on international trade taxes, further trade liberalization in the region will be unlikely. In spite of the well-known benefits of free trade the governments of Latin America simply cannot afford further trade liberalization. Meaningful tax reform seems also unlikely. This means that low overall tax effort will continue; as well as the associated problems of high governmental debt and insufficient investment in needed infrastructure. The regions dysfunctional income tax systems as evidenced by the phenomenon of Latin

America collecting little income tax in spite of having the highest income tax rates in the world will also likely continue. Implications of this analysis imply that Latin America's overreliance on International Trade Taxation as a source of governmental revenue is likely to continue.

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