AN EMPIRICAL STUDY ON TRADE OPENNESS AND INCOME INEQUALITY IN LATIN AMERICA INCORPORATING WITH FDI INFLOWS, GDP GROWTH AND INFLATION

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DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

(4) The word count of this research report is **24,560** words.

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ABSTRACT

This study investigates the relationship between trade openness and income inequality in Latin America in cooperating with FDI inflows, economic growth and inflation. This study uses Panel Data analysis and employed Random Effects Model (REM) to estimate the relationship between trade openness and income inequality and others macroeconomics variables. The results of this study indicates that trade openness and income inequality is positively correlated while economic growth and income inequality is negatively correlated. It is also found that FDI inflows and inflation is insignificant in effecting income inequality.

CHAPTER 1: INTRODUCTION

1.0 Introduction

This chapter will start with the background of the research which includes income inequality in Latin America followed by the problem statements regarding the issues of income inequality. The objectives and problems for this study will also be discussed. Last but not least, the significant which comprise of importance and contribution of the study will also be explained in this section.

Income inequality refers to the point that income is distributed in an uneven manner across the population. It is a measurement on the unequal distribution or the gap of the income on individuals or household across the various participants in the economy. Income inequality is often related to the idea of income "fairness". For example, if the rich in the entire country have a disproportionally larger portion of the country's income compared to the poor on the overall population, it is considered as an "unfair" income distributions.

1.1 Research Background

Latin America has long been viewed as the most inequality region in the world (Cord, Lucchetti, Castelán & Ratzlaff, 2013). The most common measurement in measuring inequality of a region is by using Gini coefficient. Gini coefficient measures the difference between the actual distribution of income and the perfectly equal distribution of an individual in percentage. The Gini index values range from 0 to 100, where 0 represents perfect equality while 100 represents perfect inequality. The higher the value of the coefficient indicates that higher the degree of inequality.

Table 1.1: Median Gini Coefficients by Region and Decade

Region	1980 - 1989	1990 - 1999	2000 - 2009	2010 - 2014
Europe & Central Asia	26.4	34.3	32.7	32.2
South Asia	30.1	35.3	36.3	33.9
East Asia & Pacific	38.2	39.0	39.7	37.4
Middle East & North Africa	41.3	38.6	35.9	33.0
Sub-Saharan Africa	41.3	47.2	45.3	43.6
Latin America	**53.1**	**51.8**	**52.5**	**48.9**

Source: Authors' calculation based on World Bank Gini Index (2015).

The table above shows that Latin America has the highest inequality distribution within the world since 1980s. Nevertheless, Latin America has the highest inequality distribution in the 1980s compared to other decades partially due to debt crisis and inflation (López-calva & Lustig, 2010). The beginning of the debt crisis during the 1970s and oil price shock in 1973 created current account deficit in Latin America (Sims, 2013). More and more external finance were required to sustain imbalance current account that resulted from higher oil prices, and eventually accumulated a large external debt (Damill, Frenkel & Rapetti, 2013). In the 1980s, Latin America has faced the most serious debt crisis since the world depression in the 1930s. It's often referred as the "lost decade" as its effects extended almost a decade. The debt crisis of the 1980s in Latin America has lead Latin America reached a point where their external debt is more than their earning power and unable to repay its debts (Sims, 2013).

Besides that, inequality rises during 1980s was also partially due to rising of inflation (Morley, 2001). Morley explains that when the policy makers in Latin America attempts to control inflation, they usually delays minimum wage adjustments and this will eventually led to a decrease in real purchasing power and reduce real income at the bottom of the income pyramid (lower income group). Hence, widens the inequality in Latin America.

Inequality has not been reduced continuously during the recovery in Latin America in 1990s and 2000s as shown in Table 1.1. According to Campos and Kinoshita (2008), Latin America experienced structural reforms such as privatization of state-owned enterprises and liberalization of trade and foreign investment in the 1990s. Most Latin America countries moved towards the structural reforms to increase productivity and potential growth (Bértola & Weber, 2015). Countries like Argentina, Uruguay and Chile are the first to move towards reforms by tariff reductions and financial liberalization in 1990s and then followed by Brazil and Mexico to undertake reforms to increase exports and generate the trade surpluses to pay off their external debt (Morley, 2001; Ter-Minassian, 2012; Devlin & Ffrench-Davis, 1995).

During 2000s, Argentina, Brazil and Uruguay had suffered from South America economic crisis (Damill et al., 2013). Argentina and Brazil are the two largest economies in Latin America, therefore this two countries is going to have a big impact on the overall aggregate outcomes in Latin America. Damill et al. (2013) summarized that Argentina was facing massive external debt in early 2002 and this has forced Argentina to devalue its own currency and fix its exchange rate to US dollar. Likewise, Brazil devalued its currency in 1999 to increase its exports and money demand. On the other hand, the Argentina crisis in turn hit Uruguay, which has lead Uruguay to suffered a financial and banking crisis, as well as a serious banks run problem by depositors from Argentina and this has caused Uruguay government to stop banking operations in July 2002.

Latin America has experienced the most favorable period of economic growth from 2003 to 2007 after the end of World War II in the mid-1970s (Ocampo, 2009). If inequality increased in the 1980s was because of bad economic condition, the inequality should have decrease as Latin America is doing well in the 1990s and 2000s. However, Latin America's inequality continues to be high where the Gini coefficient measured at 52.5 in the 2000s.

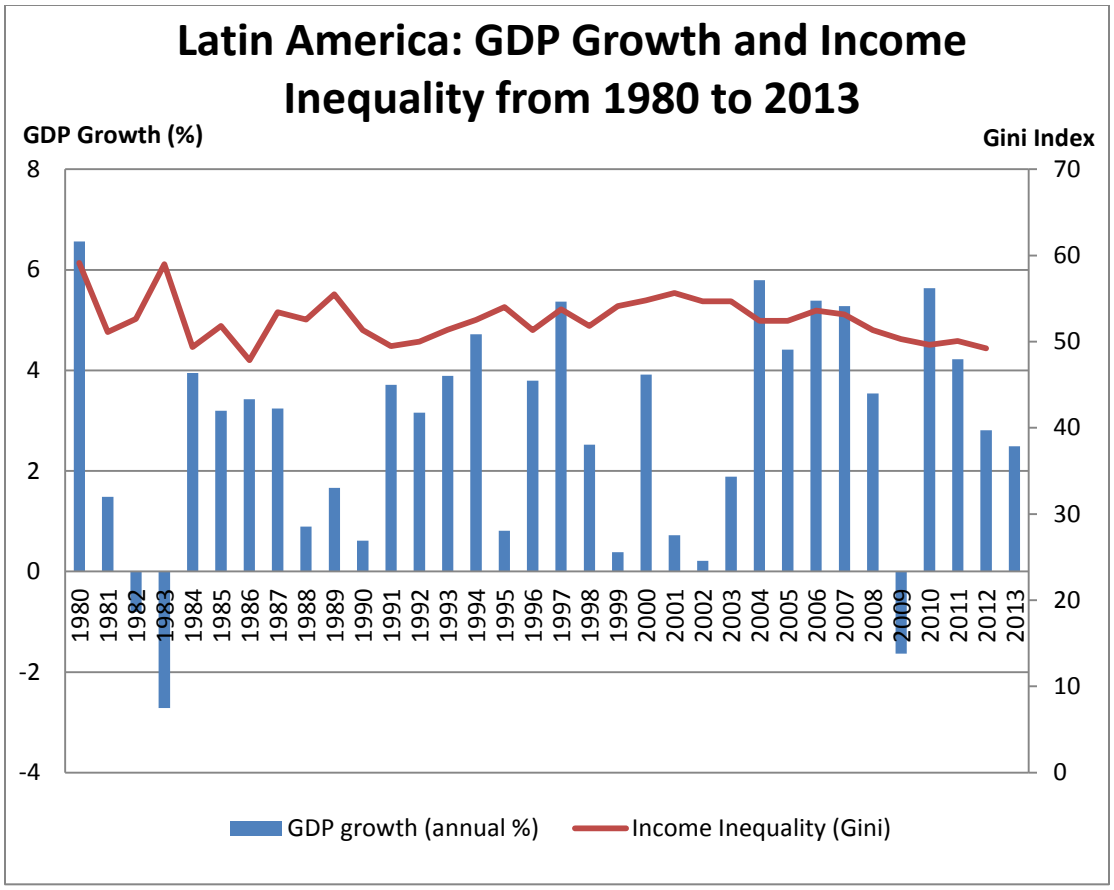


Figure 1.1 Latin America: GDP Growth and Income Inequality from 1980-2013

Source: World Bank (2015).

Figure 1.1 clearly shows that there is a large decline in GDP in 2009. The reason is that the global financial crisis had hit Latin America very hard in the October of 2008. Global financial crisis in 2008 experienced by United States has been proven to have negative impacts on remittances, trade and FDI to Latin America while the impacts of the crisis resulted mainly in the first half of 2009 (Blanco, 2010).

As shown in Table 1.1, although income inequality has decreased during the last decade from 52.5 to 48.9, however Latin America remains the most unequal distribution region in the world.

In fact, Latin America has run through a very rapid economic growth since the reforms in 1980s (Velde & Nair, 2006). It has then pursued globalization by attracting

a huge amount of foreign direct investment (FDI) and experiencing a rapid expansion of international trade. Trade openness is one of an economy policy that either imposes restriction or invitation to trade between countries over the world. It is also refer to the inward or outward orientation of a given country's economy. Inward orientation refers to the country's economies that overlook taking or are incapable to take the advantage in trading with other countries. On the other hand, outward orientation refers to the country's economies that are able to enjoy significant advantage when trading with other countries. Outward orientation will generally lead to a more rapid growth of exports rather than imports (Dollar, 1992). Since trade openness is a major source of boosting a country's economy, policy makers has come up with different types of strategies and/or policy decisions to intensify inward and outward orientation such as barriers on trade, promote economies of scale, enhances technologies and infrastructure, increase market competitiveness and many more.

Since significant deterioration of income inequalities condition can be highly regarded as a serious social issue therefore many researchers have tried to test whether or not trade openness has been contributing to income inequalities. It was strongly believed that the broadness of a country's economic can motivates and promotes a competitive atmosphere which leading to product's quality improvement thus economic growth (Aradhyula & Seenivasan, 2007). According to the neoclassical theory of international trade, economic openness will improve the real and nominal return on the abundant factors and weaken the real and nominal return on the scarce factor of a given county (Faustinoa & Valib, 2011). With this, openness can contribute to less developed economies (usually with large supply of cheap and unskilled worker) by enhancing the real and nominal wages of the labor and leading to reduce in income inequality (Munir, Kiani, Khan, & Jamal, 2013).

1.1.1 Research Background of Argentina, Brazil, Costa Rica, Panama, Peru and Uruguay

This research attempts to comprehend the rise and fall of inequality in Latin America during the past decades through in-depth analysis of Argentina, Brazil, Costa Rica, Panama, Peru and Uruguay. The six countries that have been chosen can be considered as a representative sample for Latin America. These six countries are categorized as the upper-middle-income countries in Latin America (World Bank, 2014). According to World Bank income classification, there are three income economies which are low-income economies, middle-income economies and high-income economies. In the case of middle-income economies, this category further splitted into lower-middle-income economies and upper-middle-income economies. Gross national income (GNI) per capita which calculated based on Atlas method is usually used as a tool to classify the world's income economies.

Based on World Bank income classification, Argentina, Brazil, Costa Rica, Panama, Peru and Uruguay are ranked as the upper-middle-income countries as the GNI per capita for each country is recorded in between $4,126 and $12,745 as shown in Table 1.2 below.

Table 1.2: Average GNI per Capita – Atlas Method (US$) of Six Countries in Latin America

Country	1970 - 1979	1980 - 1989	1990 - 1999	2000 - 2009	2010 - 2013
Argentina	2,053	3,003	6,693	5,466	9,180
Brazil	1,086	1,999	3,637	4,694	10,888
Costa Rica	1,003	1,673	3,004	4,798	8,265
Panama	1,064	2,131	2,821	4,958	8,973
Peru	831	976	1,720	2,635	5,308
Uruguay	1,328	2,457	5,240	5,978	12,700

Source: Authors' calculation based on World Bank GNI per Capita (Atlas Method).

According to World Bank (2015), Argentina and Brazil are the two largest economies in Latin America, with a Gross Domestic Product (GDP) of US$609.9 billion and GDP of US$2.246 trillion in 2013 respectively. During the last 30 years, Argentina experienced a sharp increase in income inequality due to macroeconomic crisis, high unemployment, hyperinflation and so on, but the inequality started to fall in the 2000s (Gasparini & Cruces, 2009; Gasparini & Lustig, 2011). In the case of Brazil, it is one of the highest levels of income inequality in the world. According to Psacharopoulos, Morley, Fiszbein & Wood (1995), Brazil reached a historical and worldwide record of the greatest Gini coefficient which equal to 63.4 due to the crisis in 1989. However, with improvement in economic, the Gini coefficient has been falling steadily since 1998 (Gasparini & Lustig, 2011)

Peru and Panama, the fast growing countries in Latin America, have a GDP of US$202.3 billion and US$42.65 billion in 2013 respectively (World Bank, 2015). Peru was recently consolidated macroeconomic stability and resulted in a declining trend in income inequality due to significant growth in labor market (Andina, 2013). In recent years, Panama that is driven by broad investments is considered as the fastest growth country in Latin America with continuous growth from US$15.46 billion in 2005 increase to US$42.65 billion in 2013. However, inequality still remains relatively high in Panama with the Gini coefficient of 51.9 in 2012 as nearly one-fourth of the population of Panama still live in poverty (Ölander, 2015)..

According to MercoPress (2013), Uruguay's social and political stability, relatively high income per capita, and strong regulations characteristics are fully in line with foreign investment requirements and thus it helped to build a strong economic performance in Uruguay. Strong economic performance in Uruguay has resulted in lowest income inequality in Latin America and recently Uruguay became one of the high income countries in Latin America (World Bank, 2013; Tucker, 2014). Lastly, Costa Rica has experienced steady economic expansion over the past decade. In spite of the steady growth, the level of income inequality is rising and it is expected to be worse off in recent years (Tucker, 2014).

As standard trade theory predicts, trade liberalization in the late 1980s and 1990s is expected to lead to a greater economic growth and thus more equivalent reallocation of resources (Székely, 2003). Trade liberalization and FDI expansion can be used to evaluate the impact of globalization on income inequality (Mah, 2013). In fact, trade liberalization may favor economic growth but it might be unfavorable for workers that experiencing an increasing competition from abroad. Thus, it widens wage inequality. Trade liberalization is expected to decrease inequality in the fast growing developing countries (exporters of manufactured goods). Lately, trade liberalization has been related with increasing income inequality in Latin America (Goldberg & Pavcnik, 2004).

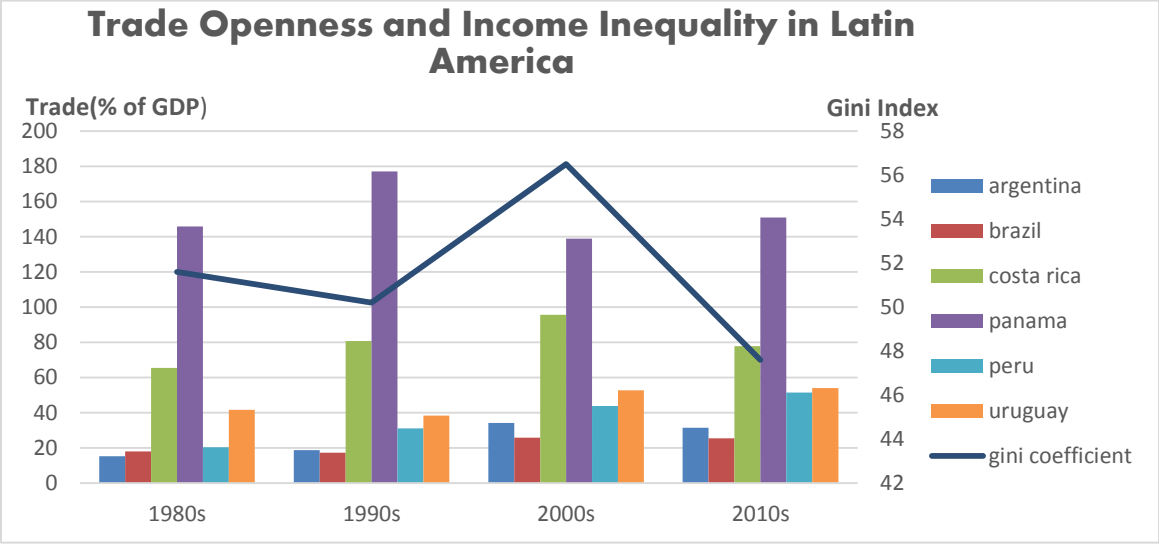


Figure 1.2: Income Inequality and Trade Liberalization in the 1980s, 1990s, 2000s and 2010s.

Source: World Bank (2014)

Figure 1.2 shows the income inequality and trade liberalization within six Latin America countries. The effects of trade openness on wage disparity are quite varied and ambiguous within Latin American countries based on the figure above. An expansive perspective at scenes of trade liberalization in the region in the 1980s, 1990s, 2000s and 2010s suggests that increment in wage inequality in most cases.

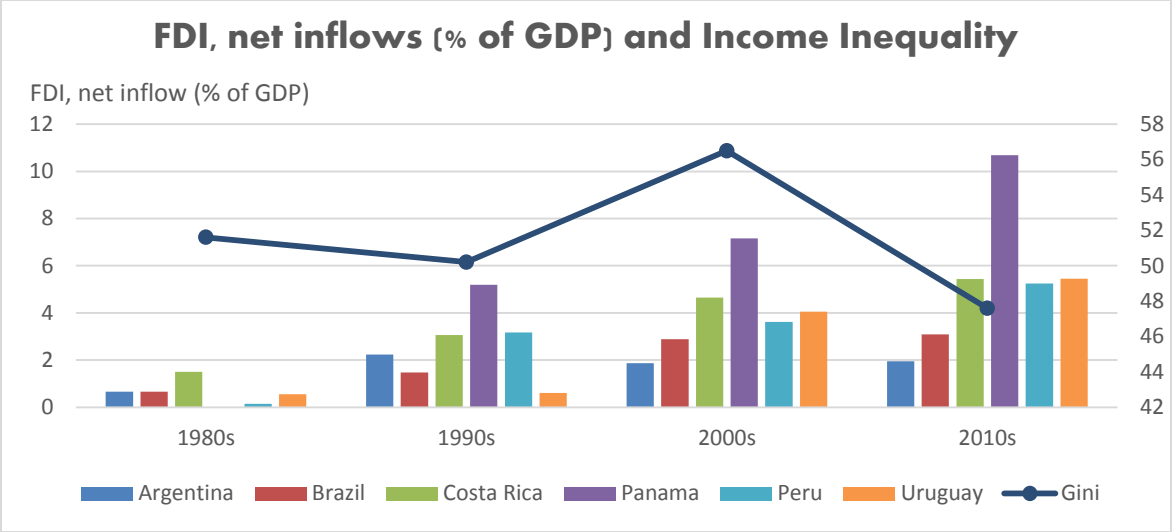


Figure 1.3: Income Inequality and FDI net inflows in the 1980s, 1990s, 2000s and 2010s.

Source: World Bank (2014)

Comparatively little attention has been paid in examining the effects of FDI on income inequality in Latin America. The relationship between FDI inflows and income inequality at the macro level is found to be valid only in developed countries. As in the case for developing countries and Latin America in particular, Feenstra and Hanson (1995) found that FDI inflows led to massive demand for skilled labor in Mexican manufacturing sectors over the period 1975-1998. In the late 1980s, some regions (that may be much localized), FDI inflows can amount to over 50% increase in the labor wage share. However, Freeman, Oostendorp & Rama (2001) use a large sample of developing countries find no evidence for a consistent relationship between FDI and income inequality. Evidences show that FDI may tend to increase income inequality rather than decrease income inequality. But it should be emphasized that the evidences so far is thin and there is no any published macro evidence especially in Latin American countries other than Mexico.

Critics contend that FDI leads to poverty, isolation and a neglect of local capabilities. FDI has increase dramatically in Latin America since the reforms in the 1980s. FDI as a part of privatization in Latin America proves that not everyone shares the same

benefits. Increase openness in Latin America lead to an increase in FDI particularly in Brazil and Argentina.

There are numerous reasons why FDI in Latin America rises from the 1990s to 2010s. The combination in the reduction of FDI restrictions and public sectors privatization has caused a significant increase in FDI in Latin America. Extensive privatization usually includes foreign investors with adequate capital. Countries like Argentina and Brazil have attracted significant FDI through privatization mainly in manufacturing sectors while service sectors is mainly dominated in Peru.

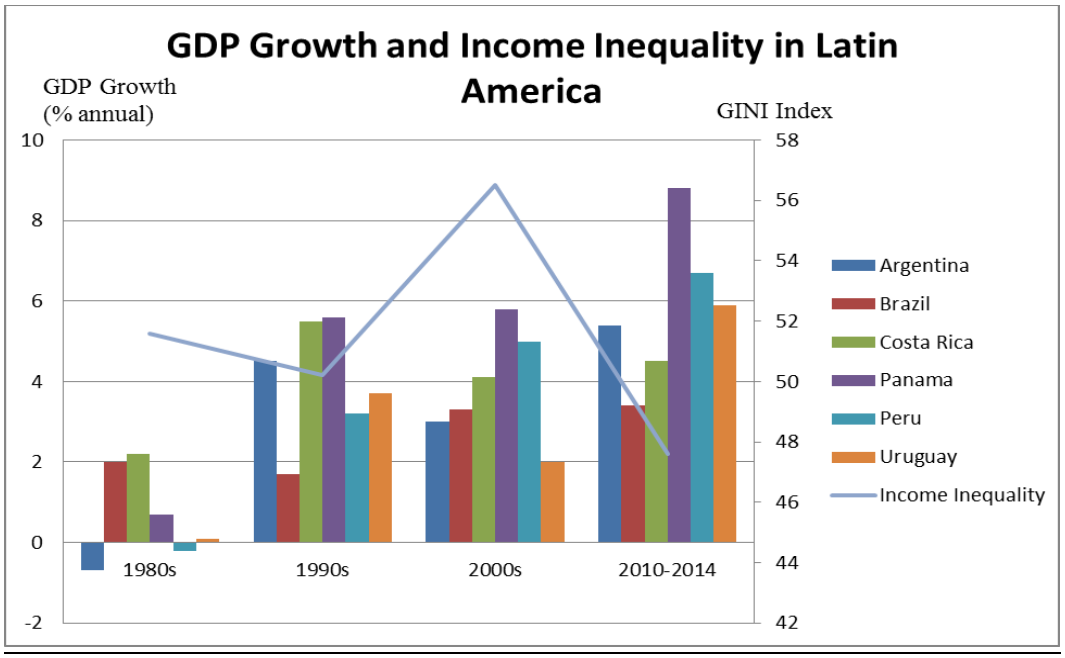


Figure 1.4: GDP Growth and Income Inequality of Six Countries in Latin America

Source: World Bank (2015)

Apart from that, Argentina, Brazil, Costa Rica, Panama, Peru and Uruguay has been growing in past few decades as shown in Figure 1.4. Figure 1.4 presents the correlation between GDP growth and income inequality which is measured in Gini indices. Since there was political transition to democracy in the 1980s, Latin America has been known for its display of erratic economic growth rates (Bittencourt, 2012). The countries following this pattern include; Argentina and Peru. In fact, economic stabilization comes only in the middle of the 1990s with the implementation of

particular economic institutions and the economic growth starts to show a positive trend (Alesina & Drazen, 1991). The widen income disparity has become a concern in Latin America because of the rising of the expectation that trade liberalization and globalization in the late 1980s and 1990s would lead to greater economic growth and reduce the income inequality (Meschi & Vivarelli, 2009). According to Lustig, Molina, Paz, Pereira, Scott, Pessino & Jaramillo (2013), after rising in the early 1990s, however, income inequality in Latin America in the 2000s unambiguously declined in the majority of countries.

While economic growth is proven to be one of the key factors behind the reduction in income inequality, the persisting problem of income inequality in Latin America has raised doubts about the efficacy of economic growth in its reduction (Perera & Lee, 2013). Recent evidence reveals that growth in the six countries in Latin America has been accompanied by a decrease in relative income inequality (Meschi & Vivarelli, 2009). However, empirical studies show that a positive linkage between economic growth and income inequality has existed since the 1970s (Majumdar & Partridge, 2009).

For macroeconomic environment, inflation rate is likely to affect the income distribution. This aspect is very crucial in Latin America as it is often characterized by highly instable macroeconomic condition. According to Bittencourt (2012), Latin America especially in Argentina, Brazil and Peru has high inflation rate, and even hyperinflation, in particular shortly after its political transition to democracy in late 1980s. The political instability in Latin America is mainly caused by high government turnover and electoral competition (Edwards, 1994). Inflation rate starts to be stabilized in the middle of the 1990s with the implementation of inflation targeting and other fiscal policy. Growth rate starts to show a positive trend and the income inequality is reduced in 2000s. In fact, high inflation may reduce the real income and indirectly affect the income distribution of the country. This is proven by the research of Albanesi (2007), who shows a strong positive correlation between income inequality and inflation as shown in Figure 1.5. Numerous theoretical studies

also found out the positive correlation between income inequality and inflation (Beetsma & Van Der Ploeg, 1996; Al-Marhubi, 1997).

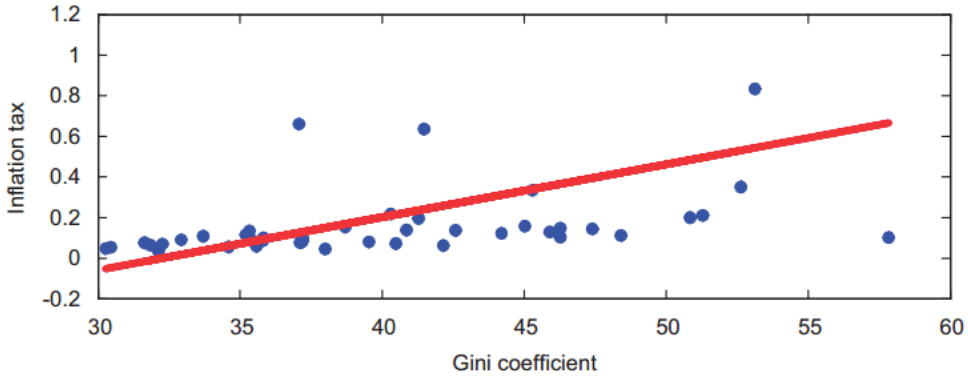


Figure 1.5: Correlation between Income Inequality and Inflation

Source: Albanesi (2007)

1.2 Problem Statement

Inequality continues to be the topic of discussion not only in the United States but also around the world and especially in Latin America. With an average Gini coefficient of 52, Latin America stands out to be one of the two most unequal regions of the world. Even if the current level of growth in Latin America were to be maintained, it would also have to take about 41 years in order for the country to close up the gap of income inequality. Although, the relationship between trade openness and inequality has been widely discussed over the past decades but the literature has not been conclusive on whether there exists a positive or negative effect on trade openness towards inequality in Latin America. It is also found that there are only little attention has been paid in examine the effect of FDI on income inequality in developing countries such as Latin America. Most studies focus mainly on developed countries rather than less developed or developing countries. As a result, other than Mexico, there is no strong evidence found in the previous studies regarding the effect of FDI on income inequality for Latin America. Economic growth is considered to be

a powerful force in redistributing the income. Economists have been concerning with the effects of economic growth on inequality over the past decade. With a high and sustained economic growth, demand on labor will increase which leading to an increase wages thus reducing the gap of poverty. But the effects of economic growth on inequality still remain suspicious. There are many developing countries achieved a high growth rate in varies period but it still does not helps to reduce poverty due to the raise in income inequality. Inflation which is a consequence of economic policies applied by most of the government in Latin America has been largely omitted in numerical past cross-country empirical research. The reason behind is that there are no comprehensive alternatives has been suggested to the simple Kuznets hypothesis. Most researchers have either estimated the simple Kuznets hypothesis or resorted to ad hoc augmentation of the original model thus far. Most of the studies do not clearly consider inflation as a determinant in affecting income inequality as well. Omitting inflation as a variable can contribute to inefficiency as inflation will not necessary lead to an equally increase in prices and this asymmetric might affect different group of people differently thus affecting income distribution and inequality.

1.3 Research Questions

i. Does trade openness significantly affect income inequality?
ii. Does FDI inflows significantly affect income inequality?
iii. Does economic growth significantly affect income inequality?
iv. Does inflation significantly affect income inequality?

1.4 Research Objectives

1.4.1 General Objective

The main objective of this study is to investigate the effect of trade openness, FDI inflows, economic growth and inflation on income inequality of the six selected countries (Argentina, Brazil, Costa Rica, Panama, Peru and Uruguay) in Latin America.

The specific objectives are:

i. To examine the relationship between trade openness and income inequality in Latin America.
ii. To examine the relationship between FDI inflows and income inequality in Latin America.
iii. To examine the relationship between economic growth and income inequality in Latin America.
iv. To examine the relationship between inflation and income inequality in Latin America.

1.5 Significance of the Study

The main contribution of this study is to fill up the gap of research in the case of Latin America. This study examine the relationship between trade openness, FDI inflows, economic growth and inflation towards income inequality and the findings are expected to help in the implementation of appropriate economy, financial and trade policies in order to reduce income inequalities thus improving the standard of living

in Latin America. Moreover, since there are many past empirical studies omitted inflation as a determinant for income inequality, this may contribute to inconsistent and biased results. This study fills up this gap by investigating the effect of inflation on income inequality. Besides, this study is mainly focused on the effects of trade openness on income inequality.

Different researches have recently identified a structural change in the increasing income inequality pattern observed in Latin America over the 1990s decades following by a reduction during the 2000s decade. The database allows placing these new changes in a historical perspective by providing comparisons since the 1980s decade. More importantly, this study addresses the question of whether the new decreasing inequality trend is associated to the longer-run effects of openness that occurred two decades earlier.

Most studies characterize trade openness as represented by the level of average tariffs in the economy, where reductions in this variable lead to greater openness. However, the countries do not report their weighted average tariff rate or even their simple average tariff rate every year, so the most recent data may be several years old. The data for both tariff and non-tariff indicators are measured with some error due to weaknesses in the underlying data which are issues of both collection and coding and there are frequently problems with missing data due to activities outside the formal market such as smuggling. Problems thus arise when attempting to aggregate data into these types of index measures and this can make consistent cross-country comparison a difficult task. Also, tariff most of the time as representative of imports is hardly to be used as a proxy for exports. Import elasticity is likely to vary across products and countries, thus implying that a tariff of a given magnitude may have different effects for both differentiated products in a single country and for the same product across different countries. Thus, this study chooses to use trade openness (net imports and exports) to GDP ratio as indicator instead of tariff in order to examine the relationship between trade openness and income inequality.

1.6 Definition of Key Constructs

Income inequality is estimated using Gini coefficient or in another word Gini index. Gini coefficient measures the extent to which the allocations of income or consumption expenditure diverge from a perfectly equal allocation among individuals and households within an economy. The Gini coefficient values range from 0 to 100. A Gini coefficient of 0 donates prefect equality while a coefficient of 100 implies prefect inequality as stated in World Bank (2015).

Trade is measured by the sum of exports and imports of goods and services as a share of gross domestic product (% of GDP). The trade-to-GDP ratio is a basic fundamental indicator of trade openness and economic integration. It shows the dependence of exports and imports of the domestic country relative to the country's GDP. **Foreign Direct Investment (FDI)** is defined as the sum of equity capital, reinvestment of earnings and other long-term capital plus short-term capital as stated in the balance of payments. In this study, the series of FDI inflows show the net inflows (new investment inflows minus disinvestment) from foreign investors, and is divided by GDP (% of GDP). **Economic growth** referred to the annual percentage (annual %) growth rate of GDP based on market price at a constant local currency. GDP is defined as the sum of gross value added by all local producers in the economy plus any product taxes and minus subsidies which are not included in the value of the goods produced. The value of GDP is computed without making any deductions for depletion and degradation of natural resources and/or for depreciation on fabricated assets. **Inflation** shows the changes of price rate in the economy which measured by the annual growth rate of the GDP implicit deflator (the ratio of GDP in current local currency to GDP in constant local currency) (World Bank, 2015).

1.7 Chapter Layout

The structure of this study is as following: Section 2 reviews the literature on income inequality in Latin America since the economic reforms and the independent variables that affect income inequality; Section 3 presents the data and empirical methodology; Section 4 analyses and discusses the results, and Section 5 concludes and recommends it.

1.8 Conclusion

This study analyzes the effect of trade openness on income inequality in Latin America by incorporating FDI inflows, economy growth and inflation. Since income inequality remain as a hot topic in the society, the determinants that affecting the changes of inequality has become significantly important to influence the decisions of policy makers. As such, it is important to investigate the determinants thus contributing to future research and development.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This chapter reviews previous studies regarding the linkage between trade openness, FDI inflows, economic growth, inflation and income inequality. Section 2.2 discusses about the theoretical framework of this study and lastly, hypotheses are determined.

2.1 Review of the Literature

2.1.1 Relationship between Trade Openness and Income Inequality

In early 1980s, many developing countries had started to follow the trend of trade liberalization and opened up their economies to the global markets (Shafaeddin, 2005; Meschi & Vivarelli, 2007). Whether such economic globalization has positive or negative effect on inequality within developing countries is an enduring question in the economic literature. Bhagwati (2004) defined globalization as a national economy has been integrated into the global economy through international trade, foreign direct investment (FDI), capital flows, labors migration across borders, and diffusion of technologies and knowledge. This study focuses only on two dimensions of globalization, namely international trade and FDI. The former will be discuss in this section and the latter will be discuss in the following section. Different subcomponents of globalization affect inequality differently. Globalization can be divided into trade globalization, financial globalization and technological development. The transfer of technology is related to increased

globalization, but technology has not contributed as much as globalization in developing countries (Asteriou et al., 2014). Technological development does not seem to have a separately identifiable effect on inequality; it is interconnected with trade and financial globalization. As evidenced, FDI inflows and trade occur in the host countries may incur the technological diffusion or spillover (Aghion & Howitt, 1997). This study includes trade globalization (trade openness) and financial globalization (FDI inflows) to find the offsetting effects of globalization as increase trade tends to reduce income inequality, while FDI tends to increase it (Asteriou et al., 2014).

There are many researches that examine the impact of trade openness or globalization on income inequality. The most important leading framework to understand the link between international trade and income inequality is the Hecksher-Ohlin (HO) model and its extended model, Stolper-Samuelson (SS) theorem. According to this principal international trade theory, under free trade, country with relatively abundant factor will specialize in the production of goods that use intensively the abundant factor (Stolper & Samuelson, 1941). Most of the developing countries are relatively abundant in unskilled labor and thus have a comparative advantage in producing unskilled labor-intensive goods when compared to developed countries. Therefore, trade openness should raise the demand for the unskilled workers as well as their wages and consequently decrease in income inequality (Meschi & Vivarelli, 2007).

SS theorem has been questioned by other researchers. They listed out some important critiques on SS theorem. Harrison et al. (2010) criticized that trade liberalization do not always reduce income inequality within a country. In the case of developed countries (skilled labor abundant countries), increase in the demand of skilled labor will increase their wages when comparing to unskilled labors (Bergh & Nilsson, 2010). To take United Kingdom (UK) as example, Cribb (2013) explains increase in inequality in another possible way. Under free trade, goods that produced by unskilled labor can be imported because unskilled labor-intensive goods can be produced relatively cheap in

developing countries compared to developed countries such as UK. This circumstance would lead to lower wage for unskilled workers in UK and create a wage gap between skilled and unskilled labors and eventually increase in income inequality. Therefore, inequality would increase accompanied by greater trade openness (Harrison et al., 2010). In addition, assumptions in HO model and SS theorem are somewhat unrealistic to apply in the real world situation (Davis & Mishra, 2007). Suppose that the model involve multiple traded goods and countries that are characterized by different and changing technologies, the impact of trade on income inequality may differ from SS theorem (Meschi & Vivarelli, 2007).

According to Atif, Srivastav, Sauytbekova & Arachchige (2012), globalization affects income inequality through two different ways: first, globalization stimulated economic growth which in turn helps to reduce poverty and inequality; and second, it is blamed to have negative impacts on income inequality due to globalization causes economic insecurity. The first phenomena can be found in the studies of Meschi and Vivarelli (2007), Wei and Wu (2001), David (2011), Chaudhry and Imran (2013), Atolia (2007). While the second phenomena can be found in the studies of Cribb (2013), Li (2010), Atif et al. (2012), Goldberg and Pavnik (2007), Bebczuk and Gasparini (2001), Galiana and Sanguinetti (2000), Bogliaccini (2013), Casacuberta and Vaillant (2002), Amarante, Colafranceschi & Vigorito (2011), Wood (1997), Spilimbergo, Londoño & Székely (1997), Perry and Olarreaga (2006).

Wei and Wu (2001) found that cities in China experience a greater drop in urban-rural income inequality due to trade openness. They observe a greater increase in the trade-to-GDP ratio in China and rapid drop in the income inequality at the same time. However, this view is not accepted by Li (2010), as trade liberalization worsens inequality in China. According to Cao (2004), China is one of the largest high-tech exporting countries in the world which able to produce more technology-intensive products. Li (2010) applies the SS

theorem and states that China mostly involves in skilled-biased technologies to produce technology-intensive goods. It will increase the demand for skilled labor in China and thus widen income inequality between skilled and unskilled labor, where China is abundant in unskilled labors in its net.

In addition, research of David (2011) on Brazil is also consistent with Wei and Wu (2001). The result implies a significant and negative relationship between trade liberalization and income inequality (David, 2011). Author applies the Stopler-Samuelson (SS) theorem to illustrate that Brazil has high endowments of labor compared to capital. Most of the industries in Brazil are still labor intensive where the Brazilian workforce is considered as unskilled worker (Bijleveld, 2011). Based on the SS theorem analysis, Brazil will specialize in the production of unskilled labor-intensive goods since Brazil has comparative advantage in labor abundant factor (Harrison et al, 2004). Therefore, the demand of unskilled workers may increase as well as their wages. The wage disparity between skilled and unskilled labor will be decreased and the country's income inequality will also be reduced (David, 2011).

Furthermore, the case study in Pakistan demonstrates clearly that the negative relationship between trade openness and income inequality. Chaudhry and Imran (2013) rest on the assumptions of HO model, and doubt that whether international trade would still lead to a comparative advantage in the production of unskilled labor-intensive goods if Pakistan is abundant in unskilled labors. They conclude their result from time series regression analysis that trade liberalization reduces income inequality in long run but not in short run. In addition, Atolia (2007) shows a different point of view in the HO model but reach a similar conclusion with Chaudhry and Imran (2013). Atolia (2007) demonstrates that trade openness has negative effects on inequality in the short run but positive effects in the long-run which is consistent with HO model. Multiple relationships between trade and income inequality is due to the asymmetries in the speed of adjustment in the export and import sectors (Atolia, 2007).

Atif et al. (2012) state that increase in globalization leads to an increase in income inequality in developing countries. These authors negate the trade theory and puts forward statistical empirical evidence by implied various econometric techniques. Goldberg and Pavnik (2007) has reached similar conclusion of trade liberalization will increase income inequality in developing countries as they argue free trade in developing countries are not consistent with the naive view of HO model.

With such international trade, Uruguay experiences a rise in income inequality (Casacuberta & Vaillant, 2002; Amarante et al., 2011). According to Casacuberta and Vaillant (2002), trade liberalization causes increase in income inequality could be explained by global competition faced by Uruguay. To handle this challenge, industries in Uruguay are forced to adopt technical progress to improve productivity and thus unskilled labors are replaced by skilled labors and machines. This factor reallocation in industries has widened the skill differential and thus raised income inequality between skilled and unskilled labors. Amarante et al. (2011) state that increase inequality in Uruguay can be explained by several mechanisms such as suppression of wage centralization, reduction in minimum wages, lack of a social protection system and most importantly trade liberalization.

Also, in the case of Argentina, a country relatively abundant in natural resources and skilled labor will shift towards production to the sectors that use those abundant factors intensively under free trade. As a result from such allocation, it widens the wage gap between the skilled and unskilled labor (Bebczuk & Gasparini, 2001; Galiani & Sanguinetti, 2000). Trade liberalization affected inequality through different paths which are the fall in the price of capital and the adoption of new skilled labor intensive technologies. These consequences of the greater integration of Argentina to the global economy implied an increase in the demand of skilled labor in all sectors and hence increase in the skill differential. All of these effects are proved to be a significant determinant of increasing income inequality. Thus,

Bebczuk and Gasparini (2001) conclude that greater integration lead to increase in inequality. Galiana and Sanguinetti (2000) show a similar result where they found trade liberalization has increased the income inequality in Argentina. The rise in prices for the traded products will increase the region's income (Galiani & Sanguinetti, 2003).

The impact of trade liberalization on income inequality is different in Latin America countries. Latin America, taken as a whole, it is said that trade liberalization tends to be associated with the increment of income inequality (Wood, 1997; Perry & Olarreaga, 2006). Growing income inequality in Latin America can be explained by factor endowments. Unskilled labor is not abundant factor in Latin America compared to China and India, but relatively abundant in land and natural resources (Spilimbergo et al., 1997; Wood, 1997; Perry & Olarreaga, 2006). Apparently, skilled intensive goods and skill biased technical appeared to be important nowadays which generally demand skilled labor. Therefore, to compete with global market, increase demand in skilled labor has led to widen gap between skilled and unskilled labor as well as income inequality.

2.1.2 Relationship between FDI Inflows and Income Inequality

Most of the researches highlighted the relationship between FDI and income inequality and this has prompted economists to pay greater attention to the role of FDI on income inequality (Wu & Hsu, 2012). FDI inflows are found to have positive impacts in stimulating economic growth and increase productivity in the host country, however the impacts on inequality is often neglected (Figini & Görg, 2006). Various studies have examined the impacts of FDI inflows on wage and income inequality however no clear conclusions can be drawn (Basu & Guariglia, 2005).

Wu and Hsu (2012) found that an increase in FDI inflows tend to increase income inequality. FDI inflows in developing countries are usually attracted by large pooled of low cost labors and it has a distributional effect on the economy (Lee & Vivarelli, 2006; Ghosh, 2003). The effect of FDI inflows on income strictly depends on the initial economic conditions of the country (Te Velde, 2003). As FDI inflows are one of the types of international trade in which the primary players are mostly involving the Multinational Corporations (MNCs) which aimed to maximize profit, and thus they will select locations which can in turn achieved the corporate's goals (Kaya &Walker, 2009). Corporates do not tend to move to less developed regions with low cost labor, as they seek for skilled labor especially when the production process involved in skill-biased technology (Fenestra & Hanson, 1997; Redding & Venables, 2004; Ma, 2006; Lipsey & Sjöholm, 2004). Consequently, it widens the income gap within and across the regions in the host country. Moreover, Choi (2006) also suggests that the positively correlation between Gini coefficient and intensity of FDI and these findings demonstrate that FDI inflows will prompt worker market division in which skilled worker is paid a higher pay and wage inequality increments. Taylor and Driffield (2005) show the within industries in United Kingdom and indicates that FDI inflows positively affect income inequality based on an empirical analysis with the three digit industry level for UK manufacturing sectors over the period 1983 to 1992.

By analyzing 27 Brazilian states in three different periods, David (2011) indicates that there is a significant and positive relationship between FDI inflows and income inequality in Brazil. Bebczuk and Gasparini (2001) conclude that substantially rise in income inequality in 1990s are very likely due to the greater integration of the global economy. Rivera and Castro (2011) state that inward FDI tends to flow to big markets and more developed regions with more infrastructure and higher average income instead of flow to less developed regions or to government elements where abundant unskilled and

cheap labor in Mexico. Te Velde (2003) investigates and argued that FDI inflows do not decrease income inequality in Latin America. Herzer, Huhne and Nunnenkamp (2012) show the effect of FDI on income inequality is positively and significantly in all individual sample countries except for Uruguay. There are similar results obtained by previous researchers when focusing in examine the relationship between FDI inflows and income inequality in Less Developed Countries (LDCs). By using a sample of 33 developing countries, Tsai (1995) concludes that FDI inflows and income inequality are significant and positively correlated as FDI inflows worsen income inequality in less developed host countries. This finding is consistent with the studies done by Basu and Guariglia (2007), who studies the effect of FDI inflows on income inequality in less developed countries.

Additionally, Alderson and Nielson (1999) found that FDI inflows and income inequality is positively correlated as capital inflows generally increase the demand for skilled labors over unskilled labors causing wages inequality to deteriorate (Lipsey & Sjoholm, 2001; Feenstra & Hanson, 1997; Aitken et al., 1996). This is in line with the results obtained by Gopinath and Chen (2003) and Feenstra and Hanson (1997), they concluded that capital flows into less developed countries increase the demand for skilled labor which in turn widen the wage gap.

The negative relationship between FDI inflows and income inequality is found by many researchers such as Bhandari (2007), Deardorff and Stern (1994), Das (2005), Lee (2006), Silva (2007), Tisdell and Svizzero (2004), Jensen and Rosas (2007) and Adams (2008). Adams (2008) observes that FDI inflows are negatively correlated with income inequality in less developed countries. Deardorff and Stern (1994) show that FDI inflows exert impact to inequality through the use of low-pay unskilled workers which in turn serves as a tool to lower income inequality. This shows that FDI inflows tend to create more employment opportunities for low-skilled labor compared to high-skilled

labor. By exploring the relationship between inflows FDI and income inequality in Mexico from the period of 1990 to 2000, Jensen & Rosas (2007) found out that FDI inflows negatively correlated to income inequality. The possible explanation is that FDI inflows reduce the incomes of domestic capital in the border states and this reduces the income of higher income group. Bhandari (2007) recognizes that FDI are not significant and may decrease income inequality and in the end, it adversely influence wage distribution for transition countries. Markusen and Venables (1997) found that foreign plant operations are usually less skill intensive while high skill intensive operation dominates in headquarter (HQ) in the case of Europe. It also needs to consider that advanced countries are commonly home to the MNEs. As such, foreign plant operations which established through FDI inflows may increase the relative demand for low skill labor and decrease the relative demand for high skill labor in the host country and this will lead to a reduction in income inequality for the host country.

Besides, Figini and Görg (2006) deepen the study of Feenstra and Hanson (1997), they found that there is an inverted U-curve relationship between inward FDI and income inequality. They used data for Irish manufacturing sector and found that FDI will first widen the wage gap by introducing new technologies which increase demand for skilled labor, but overtime unskilled labors will transform into skilled labors by working with new technology. However, this effect diminishes with further increase in FDI inflows (Figini and Görg, 2006). By utilizing micro-level data from urban China in 1996, Zhao (2001) enhances the model used by Feenstra and Hanson (1997) to examine the effect of FDI inflows on China's income inequality and obtained the similar results.

There are also other researchers argued that FDI inflows does not have any impacts on income distribution. Milanovic (2005) and Sylwester (2005) use household surveys data and estimation of 3SLS respectively in less developed

countries and they supported the said of no relationship between FDI inflows and inequality. Likewise, Mahler et al. (1999) found that income inequalities are not statistical significance based on the cross-sectional data. Mah (2002) investigates the effect of the changes in trade and inward FDI on Gini coefficients and indicates that globalization does not affect the income distribution in Korea there based on the empirical evidences.

2.1.2.1 Modernization theory

Modernization theory explains the process of modernization in developing countries' economic development (Anatory, 2015; Kavalski, 2014; Johannessen, 2006). This theory emphasized the internal factors of a country while assuming that both developed and developing countries will move in the same manner (Anatory, 2015; Sandra, Druckman & Fast, 2008; Kuhnen, 1987). Thus, developed countries will benefit developing countries in the form of economic liberalization (Mihalache-O'Keef & Li, 2011). Thru FDI inflows, foreign investors are usually bringing capital and technology that are important for country's development into the host developing countries (Anderson & Taylor, 2007; Fernando, 2011; Harding & Javorcik, 2007). Developing countries benefited from such interdependence as they provide cheap raw materials and gain employment opportunities (Shirazi, 2011). FDI can improve productivity by increasing competition in an industry (Javorcik, 2004). Rise in competition lead to efficient utilization of factors of production (Khan, 2007). Besides, foreign capital inflows not only improve account deficit of developing countries but it also create positive spillover effects and increase productivity within developing host countries (Khan, 2007; Mihalache-O'Keef & Li, 2011). This modernization process will equalize development levels and real income in the long run (King & Varadi, 2002). With the presence of MNCs in developing countries, introduction of new technology may decrease income inequality. Inferior production technology in

developing countries has replaced by advanced technology from developed countries through the transfer of technology (Khan, 2007). Developing countries learn foreign production processes from developed countries, unskilled labors will transform to skilled labors (He & Liu, 2007). Reduction of excessive unskilled labors has equalizing effect on real wages between both skilled and unskilled labors (Esquivel, 2008). Consequently, MNCs engage in FDI will reduce income inequality.

2.1.3 Relationship between Economic Growth and Income Inequality

The discussion on economic growth and income inequality has been mainly focused in the past few decades (Bourguignon & Morrisson, 2002; Sala-i-Martin, 2006; Schultz, 1998). The rising of the global income inequality in the past decades is driven by the strong and continuous economic growth of various countries after the industrial revolution (Rougoor & van Marrewijk, 2015). Latin America is known as one of the regions with largest income inequalities, along with strong sociopolitical and economic instability based on the history (Delbianco, Dabús & Caraballo, 2014). Over the past few decades, this region has suffered deep crises and this has lead to a rising of income inequality (Gasparini & Lustig, 2011).

Partridge (1997), Li and Zou (1998) and Forbes (2000) show the literature evidences on the beneficial effects of economic growth on income inequality. In contrast, Persson and Tabellini (1994) and Deininger and Squire (1998) show that there is no relationship appears between economic growth and income inequality. These contrary results can be explained by the non-linear relationship between economic growth and income inequality (Barnejee & Duflo, 2003; Chen, 2003; Lin, Huang & Weng., 2006). Increasing literature evidences conclude that the impact of economic growth on income inequality

can be either positive or negative (Partridge, 2005; Fallah & Partridge, 2007). Galor and Moav's (2004) also investigate multiple growth-inequality relationships during the process of economic development.

From the viewpoint of developed countries, Andrews, Jencks and Leigh (2011) find out that higher income inequality is affected by higher economic growth. Frank (2009) explains the long-run relationship between income inequality and growth performance in the United States in order to conclude that there is a significant positive relationship between them. Davis (2007) investigates a relationship between economic growth and income inequality that is positive within countries while negative across countries over a time period. Malinen (2012) also find out that there is a long-run equilibrium relationship between economic growth and income inequality; however, this relationship is negative in the developed countries.

Ravallion (2001) carry out the surveys in 47 developing countries and come with the result showing that increases in economic growth will cause a decrease in income inequality. Some researchers argue the positive relationship between economic growth and within-country income inequality (Rougoor & van Marrewijk, 2015). However, Stewart and Moslares (2012) show the economic growth affects income inequality negatively when they perform their empirical studies in Indian states for 1980- 2010 period. Perotti (1996) also agrees that income inequality at the beginning of a long-term period is negatively linked to growth performance for developing countries.

Latin America is one of the developing countries with the most unequal income inequality in the world (De Ferranti, Perry, Ferreira, Walton, Coady, Cunningham & Wodon, 2003). Latin American region has extremely high levels of income inequality compared to other regions at the similar levels of economic growth (average per capita income) (Janvry & Sadoulet, 2000). Szekely (2003) finds a significant positive growth elasticity of inequality in the case of Latin America. However, the empirical studies of endogenous growth explain that income inequality can negatively influence on economic

growth (Janvry & Sadoulet, 2000). Psacharopoulos et al. (1995) also show that income inequality in Latin America has negative relationship with growth. Ravallion and Chen (1997) are using their 42 countries survey; find no empirical evidence that economic growth reduces income inequality.

2.1.3.1 Kuznets curve theory

Gasparini (2011) confirms that the income inequality of Latin America has increased in the 1990s as studied in the literature, but it then decrease in the 2000s, which reflects a turning point from the past two decades. In fact, the increasing income inequality following by a significant declined can be explained using the Kuznets (1955) curve theory. The theory explains the concept of an inverted U-shaped relationship between economic growth and income inequality. Firstly, income inequality will increase at the initial stage of economic until it reaches a peak. This can be proven by the evidence in Latin America as the income inequality increases during 1990s and reaches the peak during 2000s (De Ferranti et al., 2003). In the following, income inequality will decline at the maturity of economic development.

Kuznets (1955) also proposes that the structure of production will shift from agricultural sector to industrial sector when an economy is developed. The agricultural and rural sector is characterized by low per capita income and low inequality, while the industrial and urban sector has higher per capita income, and higher inequality. As economy developed, those people are moved from agricultural to industrial and they will get higher income and lead to the rising in the income inequality (Rossi et al., 2001). Thus, at the early stage of development, there is a positive relationship between economic growth and inequality (Frank, 2009). However, at the later stages of development, income inequality will fall, resulting in a negative relationship between economic growth and inequality (Aghion, Caroli & Garcia, 1999; Glomm & Kaganovich, 2008). This is because more and more people move out from agricultural

sector; the minimum wage will then be marked up as the reduced labor force in the agricultural sector. For those who shift to the industrial sector will need to work harder in order to attain the income of the richer workers.

However, Kuznets's inverted U-shape theory is rejected by some empirical studies (Bourguignon, 1990). Amos (1988) and Tachibanaki (2005) propose that there is no unique relationship between the economic growth rate and the income inequality. There are two relationships appearing; one is the upward-sloping curve by the developed countries and the other is the downward-sloping curve by the developing countries (Mo, 2000). This result consistent with Barro (2000) studies that use the panel data. Shin (2012) also shows there are two types of relationships exist between income inequality and economic growth by using two pairs of examples from the existing research. One of the most common features in the East Asian countries is that the economic growth has been reached the peak for the past 30 years; however, the income inequality is declining (World Bank, 1993). From the case studies of East Asian countries only, a negative relationship between income inequality and economic growth can be assumed. While, other cases of developed nations such as the United States and France, a positive relationship exists between income inequality and economic growth (Shin, 2012).

2.1.4 Relationship between Inflation and Income Inequality

The relationship between inflation and income inequality has been long debated. Despite an enormous literature focus mainly on the impact of inflation towards employment, unemployment, economic welfare, and economic growth, somehow there are very limited empirical studies that investigate the effect of inflation on income distribution in an international setting (Li, 2002). Bulir (2001) stated that inflation has been largely omitted in cross-country empirical research. He further explains that most of the

researchers have either examine by using the simple Kuznets hypothesis or resorted to ad hoc argumentation of the unsorted model. This is simply because there is no other alternatives have been suggested thus far. As noted by past studies, the debate on this topic remains inconclusive, thus providing contradictory point of views on this subject.

Several empirical studies found that there is a positive link between inflation and income inequality. By using panel data estimation technique, Thalassinos et al. (2012) constructed a fixed effect model based on Hausman test to examine the relationship between income inequality and inflation in 13 European countries for the period 2000 to 2009. From their findings, they conclude that there is a positive relationship exists between inflation and income inequality. Other than this, Albanesi (2007) presents his findings by using a political model in which he shows that equilibrium inflation is positively related to income inequality due to the relative vulnerability of low income groups toward inflation. He notes that since high inflation is costly for all level of households, however low income groups will tend to suffer more compared to high income groups given their vulnerability to inflation. Inflation and income inequality is positively and significantly correlated with income inequality in the data from a political economy perspective (Maurer & Yesin, 2004).

Not only to low income groups, as inflation reduces the real incomes, the impacts of inflation on middle income groups is even stronger than high income groups thus pushing the middle income groups toward poverty (Cardoso et al., 1995). Another interesting approach suggests by Cysne et al. (2005) which is based on heterogeneous agent shopping-time economy shows that higher inflation is associated with larger gap of inequality provided that the productivity of the interest-bearing asset in the transacting technology is high enough.

On the contrary, some empirical studies find a U-shape relationship between inflation and income inequality. Monnin (2014) explores the empirical

relationship between inflation and income inequality by involving 10 OECD countries over the year 1971 until 2010 and he finds a strong negative link between the two factors, however when non-collinearity takes into account, the relationship turns out U-shape. He proves that as inflation goes up, it reduces inequality until the rate reaches about 13%, inequality then starts to hike again. Mehregan et al. (2012) further enhance the use of U-shaped relationship between income inequality and inflation. Their empirical results show that the optimal inflation for Iran on income distribution should be about 12-13%. This indicates that inflation will have an insignificant or even positive effect on income distribution until the prior to 12-13% and negative and significant effect at rates higher than this range.

Looking specifically in the case of Latin America continent, the countries suffer from high inflation in the 1970 and 1980s which is believed to have led to higher inequality. Some countries even face the economy of high and enduring inflation and worst for countries like Argentina, Brazil and Peru have even suffered from hyperinflation (Gottschalk, 2007). Very often, high inflation and inequality in Latin America link closely to political structure, which in turn influence the policies implementation in the countries.

Desai, Olofsgard & Yousef (2005) note that the contrasting experiences of the transition countries and Latin America propose that the link between inflation and inequality is influenced by political structure by providing empirical evidence to support the existence of a positive correlation between the two element but merely conditional on political structure. Huber et al. (2004) analyze a set of unbalanced pooled time-series data for income distribution for 18 countries in Latin America from year 1970 to 2000. They claim that politics is an important element in shaping inequality in Latin America as the interaction of democracy and social security spending as well as the intensity of democratic legislature record contributes a significant impact on improving inequality.

By using monthly data for the six biggest metropolitan areas, Cardoso, Barros and Urani (1995) study the oscillations of income inequality distribution in Brazil during the 80s. He summarizes and concludes that inflation can widen inequality in 3 ways: first, inflation will reallocate assets which is favorable to the group who is the better player in the financial market; second, inflation tax reduces disposable income; and third, inequality will increase if high wages benefit from a more prefect indexation. Recent studies by Li and Zou (2002) uses a newly compiled cross-country panel data and identifies that their findings is consistent with the Brazilian case study as stated. The clear evidence proves that extreme inflation rates associated with the incomplete indexation coverage will lead to a regressive and significant impact in inequality (Bittencourt, 2009).

According to Gasparini and Lustig (2001), Argentina's income distribution worsens drastically towards the end of eighties, associated with hyperinflationary process in the economy. The increase in inequality appears to be linked to macroeconomic instability and hyperinflation climacteric. However, the critical macroeconomic crises and hyperinflation that implied pressure on inequality in the late eighties are not found during the nineties. In the early nineties, inflation in Argentina has fallen from 60% to less than 1% in the mid-nineties (Marquez & Morley, 1997). Somehow, this scenario does not last long. Due to the failure of neoliberalism in promoting sustainable and equitable economic growth, Argentina's economic collapse in December 2001 and hence a new policy which relies on a more active state in promoting growth has emerged since the crisis (Grugel & Riggirozzi, 2007).

Cashell (2004) suggests that unemployment rate and inflation rate are negatively correlated and this relationship can be well explained by Phillips curve. By using the data of the rate of wage increase and the rate of unemployment in reproducing Phillips' baseline, Lacker and Weinberg mention that Phillips curve express a tradeoff (a negative relationship) between two undesired economic outcomes— reductions in inflation rate

requires to associate with high unemployment rate. Inflation can influence income inequality by altering income from wage earners towards profit which lead to an increase in income of richer household and reduce the real wage of labor. Monnin (2014) tests the empirical link between income inequality and inflation by including unemployment as one of the six control variables. He shows that there is a slightly significant positive linkage between unemployment and income inequality. According to Galli and Hoeven (2001), restriction on monetary policy is likely to increase interest rate and the real appreciation which adds to unemployment. Provided that the cost of hiring and firing are relatively higher for skilled than unskilled labors, unskilled labors are more likely to be affected by unemployment, making income inequality to rise. Likewise, inflation will benefit households with greater financial assets. Wealthy households tend to earn extra income from capital gain and dividends by saving their money in financial assets while other households will tend to earn less from price rise and may confront very low interest rates on savings, reduce in wages and even unemployment. Therefore, widen the gap of income inequality (Saiki & Frost, 2014).

2.1.4.1 Macroeconomic Theory

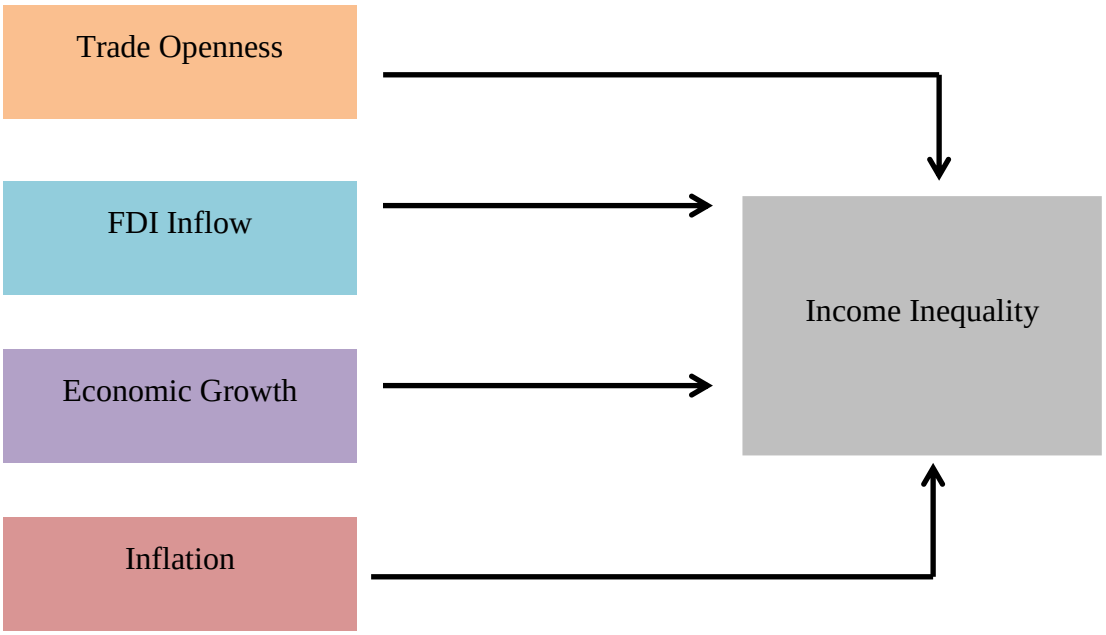
In accordance with macroeconomic theory, monetary policy plays an important role in reallocation of income and has been a debate issue for policymakers and economic commentators in the past few years (Auclert, 2014). Monetary policy can influence income inequality in both short run and long run. The theory proposes that a tight monetary policy can be expected to deteriorate income distribution in the short run while the net impact on income distribution can be vary depending on the initial inflation rate (Galli, 2001). However, an aggressive implementation of monetary policy may associate with higher level of inequality. With the existing high level of inequality and

relatively increasing in poverty, further polarization of distribution may seems to be not desirable (Saiki & Frost, 2014).

Furthermore, Jin (2010) clarifies that monetary policy affect inflation hence influences the return on human capital. The impact on human capital affects growth by altering the relative price of education services as well as the return on physical capital. Additionally, it will also lead to a change in the relative size of educational sector (more intensive in human capital) therefore exert influence on income inequality. The impacts of inflation and higher macroeconomic volatility may have two outcomes on equality: the positive and negative. The positive effects could be the transfer from creditors to debtors (assuming that creditors are mainly rich while debtors are the poor), when unexpected inflation implied, there is a possible taxation shift from labor to capital. As for negative effects, depressed wages, especially of the unskilled workers and human capital investment is an important mechanism to reduce inequality in the long run. Not only that, higher inflation and macroeconomic instability can threaten the poor as it affects labor-intensive industries disproportionately (Gottschalk, 2007). Besides, Ghossoub and Reedy (2012) point out in the presence of stock market, the effect of inflation on the capital owner's welfare may be non-monotonic and economies tend to have the strongest adverse impacts of inflation on income distribution. Nevertheless, the authors conclude that at higher levels of financial development, optimal monetary policy is usually more conservative.

2.2 Proposed Theoretical Framework

This section elaborates the theoretical framework of trade openness, FDI inflows, economic growth, inflation and income inequality so as to formalize testable empirical implications of the relevant theoretical literature.



2.3 Hypotheses Development

H1. Trade openness and income inequality is negatively related.

According to the Stolper Samuelson (SS) theorem which is derived from the Heckscher Ohlin model of trade, greater trade openness will result in a decrease in income inequality in developing countries and vice versa. Trade openness will benefit the country since specialization will favor sectors that use intensively the abundant factor (Stolper & Samuelson, 1941; Bebczuk & Gasparini, 2001). Most of the developing countries are relatively abundant in unskilled labor and thus have a competitive advantage in the production of unskilled-labor intensive goods. Trade openness would increase the demand for the unskilled labors and wages and consequently lead to an overall decrease in wage gap and income inequality between skilled and unskilled labors (Jakobsson, 2006; Meschi & Vivarelli, 2007; Krusell, Ohanian, Rios-Rull & Violante, 2000; Harrison et al., 2010). However, if a model

included multiple traded goods and countries, the prediction of the SS theorem is theoretically undetermined and might lead us away from traditional perspective on international trade (Meschi & Vivarelli, 2007; Krusell et al, 2000; Van den Berg, 2012).

H2. FDI inflows and income inequality is negatively related.

Modernization theory explains the negative relationship between FDI inflows and income inequality. This theory emphasized both developed and developing countries will benefit from economic liberalization (Mihalache-O'Keef & Li, 2011; Anatory, 2015; Sandra et al., 2008; Kuhnen, 1987). Modernization theory stated FDI inflows are an ideal mechanism for the transfer of capital, technology and knowledge that stimulate economic growth (Anderson & Taylor, 2007; Fernando, 2011; Harding & Javorcik, 2007). This benefit eventually spread throughout the entire economic in developing countries. Thus, more equal income distribution could be achieved in the long run (Tang et al, 2012; King & Varadi, 2002). In particularly, MNCs engage in FDI will reduce income inequality. The diffusion of new technology may enhance the productivity in host developing countries (Hoekman et al., 2004; Glass &S Saggi, 2012). Unskilled labors learn about foreign production processes and thus transform to skilled labors (He & Liu, 2007). Reduction of excessive unskilled labors has equalizing effect on real wages between both skilled and unskilled labors (Esquivel, 2008).

H3. Economic growth and income inequality is positively related in the short run; while negatively related in the long run.

Kuznets (1955) explains the concept of an inverted U-shaped relationship between economic growth and income inequality. He declares that there is a positive relationship between economic growth and inequality at the early stage of development (Frank, 2009). As an economy is developing, the production is moved from agricultural sector to industrial sector. The shifted workers will get higher

income compared to those who still work in agriculture sector. This will lead to the rising in the income inequality until it reaches a peak. At the later stages of development, income inequality will fall. This shows a negative relationship between economic growth and inequality in the long run (Aghion et al., 1999; Glomm & Kaganovich, 2008). The reason behind is that the minimum wage will be marked up as reduced labor force in agriculture sector.

H4. Inflation and income inequality is positively related.

The fourth hypothesis is developed based on monetary theorem. Monetary policy has an important impact on inflation thus influences income inequality. The theory suggests that inflation and income inequality are positively correlated (Romer & Romer, 1998). Contractionary monetary policy lead to a deterioration in income inequality through influencing the level of consumption, expenditure, labor earnings and total income, which contributing to its fluctuation and vice versa (Coibion, Gorodnichenko, Kueng & Silvia, 2012), see also (Fowler, 2005; Aladangady, 2014; Mumtaz & Theophilopoulou, 2015). When federal funds rate is reduced, it will lead to a higher demand for goods and services which tend to push up wages and other necessary costs, reflecting the greater demand for labor and materials to produce additional production. Li and Zou (2002) point out that price rises often run ahead of the rises in money wages when inflation is taking place thus shifting income away from wage earners. As such, they claimed that inflation increases income inequality because it harms the poor relatively more than the rich. Inflation is positive in equilibrium and larger inequality corresponds to higher equilibrium inflation (Albanesi, 2002). By illustrating the mechanism, Cysne (2004) states that Gini coefficient of income distribution shows up to be an increasing function of the rate of inflation.

2.4 Conclusion

In short, the empirical evidences are not conclusive, and the debate on the relationships of the income inequality and its determinants are still stands. Some of the results will depend notably on the data, the methodology and the sample of the selected countries. We will further explain the complex relationship between income inequality and its determinants in the following section.

CHAPTER 3: METHODOLOGY

3.0 Introduction

Chapter 3 explains the data and methods used for this study. This study will use panel data to investigate the relationship between trade openness, FDI inflows, economic growth, inflation and income inequality. Al-mulali et al. (2015) and Gorodnichenko et al. (2010) also use the panel data in their studies of income inequality in the case of Latin America and Russia respectively. Panel data is the combination between cross-sectional and time series data (Baltagi, 2008). The panel model will be used due to several advantages. In this study, six countries in Latin America have been selected and there is bound to be heterogeneity in these countries. The techniques of panel data estimation can take such heterogeneity into account by allowing for subject-specific variables (Al-mulali et al., 2015). It is also more efficient in measuring the effects that simply cannot be observed in pure cross-section or time series data (Hsiao, 2007). In order to get a handle on the time ordering of variables and to track individual characteristics over the time period, this study is necessary to use panel data.

Two common panel data regression models are fixed effect model (FEM) and random effect model (REM). FEM is used to control for or partial out the effects of time-invariant variables with time-invariant effects (William, 2015). There are limitations when it comes to applying statistical control in non-experimental studies. By using fixed effect model, as long as the characteristics do not change over time, it is possible to control the possible characteristic of the countries - even without measuring them. REM is appropriate in situations where the (random) intercept of each cross-sectional unit is uncorrelated with the regressors (Verbeke & Lesaffre, 1996). It assumes that the intercept of an individual unit is a random drawing from a much larger population with a constant mean value. The individual intercept is then expressed as a deviation from this constant mean value (Olsen & Schafer, 2001).

3.1 Data

The data set for variables which include income inequality (Gini coefficient), trade openness, FDI inflows, economic growth, and inflation are mainly derived from the World Bank — Main Economic Indicators Database. The data set of this study is long balanced panel data as the number of observations (cross-sectional data) is lesser than the number of time periods (time series data). This study contains 108 observations covering over six countries which are Argentina, Brazil, Costa Rica, Panama, Peru and Uruguay over the period of year 1995–2012. This study uses annual observations for the set of the six countries. The choices of the countries and the time period of 1995–2012 are guided by the availability of data regarding the variables that enter into the model.

Appendix 3.1 gives the complete list of the data in the selected countries. There are some missing data in the Gini coefficient of the selected six countries within the time period. In order to solve this problem, the missing data has been replaced by using median value and it has been highlighted in Appendix 3.1. Median Imputation (MDI) is used to replace the missing data for a given feature by using the median of known values of that attribute in the class where the instance with the missing feature belongs (Acuna & Rodriguez, 2004). For example, in the case of Brazil, there is missing Gini coefficient in the year 2000. It has then being replaced by taking the median value (59.16) of Gini coefficient 58.99 in years 1999 and the 59.33 in years 2001.

3.2 Measurement of Variables

Table 3.2: Definition of Variables

Variable	Proxy	Definition by World Bank Development Indicators
Gini	Latin America's income inequality index (World Bank estimate)	"Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. A Lorenz curve plots the cumulative percentages of total income received against the cumulative number of recipients, starting with the poorest individual or household. The Gini index measures the area between the Lorenz curve and a hypothetical line of absolute equality, expressed as a percentage of the maximum area under the line. Thus a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality."
Trade	Latin America's trade openness (% of GDP)	"Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product."
FDI	Latin America's Foreign Direct Investment, net inflows (% of GDP)	"Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in

		the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP."
GDP	Latin America's Gross Domestic Production growth (annual %)	"Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2005 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources."
INF	Latin America's Inflation, GDP deflator (annual %)	"Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency."

Source: World Development Indicator, 2015

3.2.1 Rationale behind Choosing the Study's Proxies

Gini coefficient is an important and common measurement to determine income inequality within each country and Gini is also used to compare income distribution across countries, for instance, the Gini coefficient in urban and rural areas in many countries are usually not similar. The Gini coefficient is sufficiently simple that it can be compared across countries and can be easily interpreted. GDP statistics are often criticized as they do not represent

changes for the whole population, the Gini coefficient demonstrates how income has changed for poor and rich. If the Gini coefficient is rising as well as GDP, poverty may not be improving for the vast majority of the population. Hence, Gini coefficient can be considered as a very essential variable that is worth to be studied. This analysis will use Gini coefficient as dependent variable in the model. There are a lot of macroeconomic factors which will determine the magnitude of the coefficient of Gini, yet this study focus on only four independent variables as mentioned in the model to investigate the relationship between them. The Gini coefficient has been chosen as this study's proxy for income inequality in Latin America.

As cited in the theoretical model, trade openness is the core variable that is found to be the mechanism of reduction in income inequality. The key independent variable in this study is trade openness. According to Lim and McNeils (2014), trade openness is more effective in changing income inequality than foreign direct investment or foreign aid. Increase in openness affects inequality within the country by affecting the amount of income redistribution (Anderson, 2005). Its impact on income inequality is widely discussed by economists and researches as mentioned in our literature reviews and theoretical models. The importance of this variable cannot be overemphasized. Thus, this study would like to include trade openness as the critical explanatory variable in the model. The measure is popular because data are readily available for many countries and, as it is quite commonly used, it allows for comparability across studies (David, 2007). This study is expecting a negative relationship between trade openness and income inequality.

FDI inflows are usually a subject of discussion much associated with the unequally income distribution. The greater mobility of factors of production stimulated by the presence of MNCs affects the income distribution within the host country and therefore generates interests in studying the effect of FDI inflows on income inequality (Zhuang & Griffith, 2013). This study focus on

Latin America which is one of the less developed countries while foreign capital always flow to less developed countries. Less developed countries have a comparative advantage on cheap abundant labor and so they are able to attract FDI inflows from developed countries (Rivera & Castro, 2013). FDI is expected to flow towards the production of tradable goods that use cheaper and abundant factor rather than costly and scarce factor. This mechanism increases the income of the unskilled labor in developing countries as this factor is mostly used in the production and it is also the most abundant. Thus, the income distribution in the region is expected to be affected. It is important to include this variable in this research. A FDI net inflow as a percentage of GDP is assumed to be the proxy of FDI inflows in this study. FDI net inflows are the value of inward direct investment made by non-resident investors in the reporting economy, including reinvested earnings and Intra-company loans, net of repatriation of capital and repayment of loans (World Development Indicator, 2015).

GDP is an important measurement to determine whether the country is experiencing economic growth and to provide information of the economy size (Callen, 2012). According to Blanchard and Johnson (2013), GDP is defined as the total value of goods produced and services provided in a country during one year. GDP is an important economic measure because it is able to project a country's health. According to Perera and Lee (2013), economic growth is proven to be one of the key factors behind the reduction in income inequality. Ferreira and Ravallion (2009) stated that "high income inequality is a characteristic of underdevelopment". GDP is included in this study in order to identify whether the economic performance affect income inequality. Based on the past studies and conventional economics theories, this study hypothesized an inverted-U relationship between economic growth and income inequality.

Inflation is also often an important topic of discussion much related to the income inequality. Extreme inflation rates contribute significantly in widening

the gap of inequality (Bittencourt, 2006). The general consensus is that inflation is correlated with higher income inequality (Maurer & Yesin, 2004). Country which has higher inequality tends to have a higher average rate of inflation (Al-Marhubi, 1997). Since Latin America experienced both inflation and inequality, thus it is important to test whether or not inflation contributes to the changes in inequality. GDP deflator is the chosen proxy for this study's inflation variable. As defined by World Development Indicator, GDP deflator measure the change in prices of goods newly produced within a country over the course of a specific time period. It is commonly used in economics to account for inflation. This research is expecting a positively related between inflation and income inequality.

3.3 Empirical methodology

This study estimates panel regression model in order to explain income inequality measured by the Gini coefficient as a function of trade openness, FDI inflows, economic growth and inflation which expressed as $\mathbf{Gini_t = f(\ Trade_t,\ FDI_t,\ GDP_t,\ Inf_t\ ).}$ Starting with the full set of variables, a simple panel model namely as Pooled OLS model with a common constant, assuming that the set of countries under the estimation are homogeneous will be applied. The two most common panel data estimation methods assuming that each country has its own unique characteristics will then be applied namely fixed effect model (FEM) and random effects model (REM).

3.3.1 Pooled OLS Model

This approach can be used when the characteristics of the groups to be pooled are relatively similar or homogenous which is the constant intercepts across

the countries (Podestà, 2002).This model is the most restrictive model as it specifies constant coefficients of intercept. The pooled linear regression model estimated by Ordinary Least Squares (OLS) procedure is written as:

$$\boldsymbol{Y_{it} = \beta_1 + \sum \beta_k X_{kit} + e_{it}}$$

Where i = 1,2,….; refers to a cross-sectional unit;

t = 1,2,….; refers to a time period and

k = 1,2,….; refers to a specific explanatory variable.

Thus, Y_{it} and X_{it} refer respectively to dependent and independent variables for unit i and time t; and e_{it} is a random error and β_1 and β_k refer to the constant intercept and the slope parameters respectively.

$$\boldsymbol{GINI_{it} = \beta_1 + \beta_2 Trade_{it} + \beta_3 FDI_{it} + \beta_4 GDP_{it} + \beta_5 Inf_{it} + \mu_{it}}$$

Gini = GINI coefficient

Trade = Trade (% of GDP)

FDI = Foreign direct investment, net inflows (% of GDP)

GDP = GDP growth (annual %)

Inf = Inflation, GDP deflator (annual %)

i = selected six countries

t = Time period from year 1995 to 2012

μ_{it} = Error term

It is assumed that all the regressors are strictly uncorrelated with the error term. For OLS to be optimal it is necessary to assume that all the error terms are independently and identically distributed with zero mean and constant variance. Thus, it is normally distributed and this causes the hypothesis testing

to be valid. OLS estimation can be used as all the following conditions (BLUE) have been fulfilled. An unbiased estimator is one that has a sampling distribution with a mean equal to the parameter to be estimated. An efficient estimator is one that has the smallest variance. Finally, an estimator is said to be consistent if its sampling distribution tends to become concentrated on the true value of the parameter as sample size increases to infinite (Podestà, 2002).

In reality, the highly restricted assumptions (homogeneity) are hardly to be achieved as the various countries seem to have different characteristics across the period. In fact, the OLS regression estimates are likely to be biased, inefficient and/or inconsistent when they are applied to pooled data as heterogeneity exist among the observations across the period.

3.3.2 Fixed Effect Model

According to Gujarati (2009), a fixed effect model (FEM) is a statistical model which represents the observed quantities in terms of independent variables that served as if the quantities were non-random. Fixed-effect helps to capture the relationship between dependent and independent variables within the country as each country has its own unique characteristics that may or may not influence the independent variables. FEM can produce consistent estimate no matter the underlying model is random or pooled, however it cannot estimate coefficients for time-invariant variables. The model assumes that individual specific effect is related to the independent variables; the individual-specific effect is treated as random variable and is allowed to be correlated with the explanatory variables.

Fixed effect model (FEM) : $\boldsymbol{Y_{it} = \beta_1 + \beta_2 X_{it} + \varepsilon_i + u_{it}}$

where i refers to the six different countries and t refers to different point of time (1995 – 2012). $\beta_2 X_{it}$ represents the fixed effect as β_2 is a fixed parameter and X_{it} terms are all measured in values. ε_i is treated as a set of fixed parameters which can either be estimated directly or conditioned out of the estimation process.

Assumption 1:

$$\boldsymbol{Cor\ (\varepsilon_i, X_{it}) \neq 0}$$

The ε_i terms and the independent variables (Xs) are correlated.

Assumption 2:

$$\boldsymbol{u_{it} \sim N(0, 1)}$$

The cross-sectional error components are assumed to be normally distributed.

Suppose the data involve a dependent variable, Gini coefficient (GINI), four independent variables which are Trade Openness (Trade), FDI inflows (FDI), Economic Growth (GDP), and Inflation (Inf), and one or more unobservable confounding variables. The panel data comprises of i-countries and t-time periods:

$$\boldsymbol{GINI_{it} = \theta_t + \delta_i + \beta_2 Trade_{it} + \beta_3 FDI_{it} + \beta_4 GDP_{it} + \beta_5 Inf_{it} + \mu_{it}}$$

where θ_t is expected to capture the period fixed effect and δ_i is expected to capture the cross-country fixed effect. Even though EFM losses it ability to estimate the impact of time-invariant variables, however it can still control their effects by including δ_i in the regression model.

3.3.3 Random Effects Model

Random Effects model (REM) is one of the most commonly used models for panel data (Bollen & Brand, 2010). RE model and general panel model are appeared to be the same at first glance. When comparing RE model to general panel model, RE model assumes the effects of independent variables (X_{it}, Z_{it}) and individual specific effect (C_i) on dependent variable (Y_{it}) is the same over time. Thus, $\beta_{1,t} = \beta_1$; $\gamma_{1,t} = \gamma_1$; $\lambda_{1,t} = 1$. Besides, RE model assumes that C_i is a random variable that is uncorrelated with X_{it}, Z_{it} and error term (μ_{it}). Another assumption of RE model is error variances are constant over all time periods ($\sigma^2_{\mu t} = \sigma^2_{\mu}$) (Bollen & Brand, 2010).

General panel model : $\mathbf{Y_{it} = \alpha + \beta_{1,t} X_{it} + \gamma_{1,t} Z_{it} + \lambda_{1,t} C_i + \mu_{it}}$

Random effect model (REM): $\mathbf{Y_{it} = \alpha + \beta_1 X_{it} + \gamma_1 Z_i + C_i + \mu_{it}}$

In RE model, the individual specific effect (C_i) is a random variable which is uncorrelated with the independent variables (Schmidheiny, 2014; Allison, 2009). RE analysis places C_i into the error term in pooled OLS regression and thus RE model is formed (Wooldridge, 2010). In order to get unbiased and consistent estimators, there are two assumptions need to be fulfilled which are uncorrelated effects, constant variances and identifiability (Schmidheiny, 2014; Wooldridge, 2010).

Assumption 1:

(a) $E(C_i \mid X_{it}, Z_i) = E(C_i) = 0$
(b) $E(\mu_{it} \mid X_{it}, Z_i, C_i) = 0$

The main difference between the fixed effect (FE) model and random effects (RE) model is that RE model assumed the unobserved variables are uncorrelated with all the independent variables in the model [$E(C_i \mid X_{it}, Z_i) = 0$]; while the FE model allowed the unobserved variables to be correlated with all the independent variables (Allison, 2009). This assumption indicates that

C_i is independent of X_i and Z_i. Followed by strict exogeneity in assumption 1(b) indicates that all the independent variables are uncorrelated with the error term in each time period (Hayashi, 2000; Wooldridge, 2010). If RE model observed autocorrelation in composite error ($V_{it} = C_i + \mu_{it}$), OLS regression model cannot be used because of OLS estimators are not the best linear unbiased estimators (BLUE) (Gujarati & Porter, 2002). RE model can be estimated via Generalized Least Squares (GLS) or Feasible GLS (FGLS) framework (Williams, 2015; Wooldridge, 2010; David, 2011). In order to ensure the consistency of GLS or FGLS estimators, RE model can be written as below for all time periods:

$$\mathbf{Y_{it} = \alpha + \beta_1 X_i + \Upsilon_1 Z_i + V_i}$$

where, $V_i = C_i j_T + \mu_i$ and $E(V_i \mid X_i, Z_i) = 0$

j_T is the vector for the different years (T).

To apply GLS or FGLS estimators, it is important to identify whether the variance structure is known or not. FGLS are usually used when comparing to GLS estimators due to variance is often unknown (Wooldridge, 2010).

RE model above fulfilled the strict exogeneity assumption. Thus, GLS or FGLS framework will provide unbiased and consistent estimators (Wooldridge, 2010).

Assumption 2:

(a) $V(\mu_{it} \mid X_{it}, Z_i, C_i) = \sigma^2\mu$
(b) $V(C_i \mid X_{it}, Z_i) = \sigma^2_{c,i}(X_{it}, Z_i)$

Assumption 2(a) implies that error variances are same over time while assumption 2(b) implies constant effect variance of the individual specific effect (C_i) (Schmidheiny, 2014).

In RE model, estimator of the coefficients and variances of the error term (μ_{it}) and individual specific effect (C_i) is usually FGLS estimator (Williams, 2015;

Wooldridge, 2010). The estimator of the variances of μ_{it} and C_i are used to form variance-covariance matrix for FGLS estimator. Therefore, these assumptions must be satisfied in order to achieve consistent and unbiased estimators ((Bollen & Brand, 2008).

RE model can be presented as

General form : $\mathbf{Y_{it} = \alpha + \beta_1 X_{it} + \Upsilon_1 Z_i + C_i + \mu_{it}}$

Where,

Y_{it} = Dependent variable

α = Intercept term

β_1 = Coefficient of the time-varying independent variable

X_{it} = Time-varying independent variable

Υ_1 = Coefficient of time-invariant independent variable

Z_i = Time-invariant independent variable

C_i = Individual-specific effect

μ_{it} = Error term

Estimate model: $\mathbf{Gini_t = \alpha + \beta_1 Trade_t + \beta_2 FDI_t + \beta_3 GDP_t + \beta_4 Inf_t + \Upsilon_1 Z_i + C_i + \mu_{it}}$

Gini = GINI coefficient

Trade = Trade (% of GDP)

FDI = Foreign direct investment, net inflows (% of GDP)

GDP = GDP growth (annual %)

Inf = Inflation, GDP deflator (annual %)

t = Time period from year 1995 to 2012

* $\Upsilon_1 Z_i$, the time-invariant independent variable is ignored because this study assumes no time-invariant independent variable.

3.3.4 Hausman Test

It may seem to be complicated by incorporating various theoretical and practical considerations into model choice. As such, Hausman test will be used in order to decide between a fixed effect model and random effects model. This test is basically examines whether or not the unique errors are correlated with the regressors. If no, then random effect is preferable and vice versa (Clark & Linzer, 2012).

Test statistic: $\boldsymbol{H} = (\widehat{\boldsymbol{\beta}}^{\boldsymbol{FE}} - \widehat{\boldsymbol{\beta}}^{\boldsymbol{RE}}) [\, \boldsymbol{Var}(\widehat{\boldsymbol{\beta}}^{\boldsymbol{FE}}) - \boldsymbol{Var}(\widehat{\boldsymbol{\beta}}^{\boldsymbol{RE}}) \,]^{-1} (\widehat{\boldsymbol{\beta}}^{\boldsymbol{FE}} - \widehat{\boldsymbol{\beta}}^{\boldsymbol{RE}})$

where $\hat{\beta}^{FE}$ are the coefficient estimates from fixed effect model and $\hat{\beta}^{RE}$ is the corresponding coefficient estimates from random effects model. If there is no correlation between independent variable and the unit's effect, then $\hat{\beta}^{FE}$ should be similar to $\hat{\beta}^{RE}$.

Hypothesis:

$$\boldsymbol{H_0}: \boldsymbol{REM\ are\ consistent\ and\ efficient}$$

$$\boldsymbol{H_1}: \boldsymbol{FEM\ are\ consistent\ and\ efficient}$$

If the null hypothesis is rejected, the coefficients are significantly different, thus using fixed effect model is more suitable than random effects model.

3.4 Conclusion

This chapter explains all the data sources and methodologies that will be carried out in the next section. Panel data regression model will be used to find the relationship between the trade openness, FDI inflows, economic growth, inflation and income inequality.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

As discussed in Chapter 3, this study will use panel data to find the relationship between trade openness, FDI inflows, economic growth, inflation and income inequality. This chapter will presents the empirical results by estimating panel regression model. The static panel estimation method of random effects will be mainly focused as suggested in Hausman Test. Discussion of the results will be the last part of this chapter.

4.1 Empirical Results

This study starts an empirical analysis by estimating panel regression model for all the independent variables that are expected to affect income inequality, according to the theoretical framework. The first model is a simple panel with a common constant, assuming that the set of countries under the estimation are homogeneous. It is known as Pooled OLS model. The empirical results of the estimators for Pooled OLS model after running the regression in E-view are presented in Table 4.1.

Table 4.1: Pooled OLS Model Results

Dependent Variable: Gini Coefficient			
Independent Variables	**Coefficient**	**T-statistic**	**Probability (p-value)**
Trade	0.025438	1.750365	0.0830*
FDI	0.114656	0.461499	0.6454
GDP	-0.290160	-2.086084	0.0394**
INF	-0.018516	-0.380272	0.7045
$\boldsymbol{R^2}$	0.081815		
Adj R^2	0.046157		

Durbin Watson Stat	0.256535

Source: Authors' calculation based on EVIEWS

Note: * Significant at10%

** Significant at 5%

***Significant at 1%

The dependent variable in the regressions is the Gini coefficient, and therefore a positive coefficient indicates an increase in income inequality and vice versa. The result indicates that the coefficient estimate (0.02544) of trade openness is positive and statistically significant. The p-value (0.0830) < 0.1 showing that trade openness significantly affect income inequality at the significance level of 10%. Therefore, the more open the countries to external trade, the more unequal the income distribution is. According to the statistical results, on average, Gini coefficient of each country will increase by 0.0254 percentage points respectively when trade openness increased by 1 percentage point, holding other variables constant. In terms of FDI inflows, the result shows that it is positively but insignificantly affects income inequality. Trade is found to be significant at p-value < 0.1 while FDI inflow is found to be not significant at all.

As for GDP growth with an estimator coefficient of -0.2902, it is negatively correlated with Gini coefficient. It is significant at 5% significance level as p-value (0.0394) < 0.05. This suggests if GDP growth increased by in 1 percentage point, on average, Gini coefficient of each country will decrease by 0.2902 percentage points respectively, ceteris paribus. The estimator of inflation has the smallest effect on the Gini coefficient; however, they are considered within this regression since they are important to give significance to the overall model. The results show that inflation and income inequality is also negatively correlated but it is insignificant at all levels.

The coefficient of determination, R^2, is also presented in the table for the model and it is a criterion to measure the goodness-of-fit. It gives an optimistic indication of how good the variables presented, explain well the variations of the Gini coefficient in the selected six countries. More specifically, in the Pooled OLS model, the value 0.0818

means that 8.18 % of the Gini coefficient variations are explained by the variations in all independent variables of this model. However, it must be noticed that R^2 cannot be the only method to measure the goodness-of-fit, since it is sensitive to the amount of variables that are included in the model. Meaning that, as the number of variables in the model increases, R^2 is artificially higher. Thus, the adjusted R^2 is more meaningful as it takes the degree of freedom into account. The value of 0.0462 means that 4.62% variation of Gini coefficient is explained by variation in all independent variables of this model after the degree of freedom is taken into account.

Durbin Watson statistic is a number that tests for autocorrelation in the residuals from a statistical regression analysis. The Durbin Watson statistics is always between 0 and 4. A value of 2 indicates that no autocorrelation in the sample while value of 0 indicates positive autocorrelation and value of 4 indicates negative autocorrelation. Durbin Watson statistic value in Pooled OLS model is low (0.2565), which may suggests that there is misspecification error. Positive autocorrelation problem may occur as the value is approaching zero.

Next, the analysis will be continued by re-estimating the regression model assuming each of the selected countries has their own individual specific effect on Gini coefficient. Two most common panel data estimation methods can be used namely fixed effect model (FEM) and random effects model (REM). In order to decide between the uses of FEM or REM, Hausman test is conducted as follows:

Hausman Test

Hausman Test has been adopted to check whether the random effects model (REM) or fixed effect model (FEM) is appropriate for estimation model in this research paper.

H_0: REM is consistent and efficient

H_1: FEM is consistent and efficient

α = 0.05

Decision rule: Reject H_0 if the p-value is less than the significance value ($\alpha = 0.05$). Otherwise, do not reject.

Table 4.2: Hausman Test Result

Chi-square statistic	Chi-square degree of freedom (d.f.)	Probability (p-value)
0.458360	4	0.9774

Source: Authors' calculation based on EVIEWS

Decision: Do not reject H_0 since p-value (0.9774) is greater than α (0.05).

Conclusion: REM is consistent and efficient.

The results in Table 4.2 represent a chi-square of 0.4584 with a corresponding p-value of 0.9774. The null hypothesis, which states that REM is consistent and efficient, is clearly not rejected since the p-value is close to 1. Hence, Hausman Test suggested that REM is appropriate to use as estimation model in this research, and it will be applied in the following analysis. The reason is that in the random effects model the estimators present higher levels of significance and the model presents more benefits when compared to the fixed effects model as mentioned in Chapter 3.

The static panel estimation method of random effects is then being used and the results are reported in Table 4.3.

Table 4.3: Random Effects Model

Dependent Variable: Gini Coefficient			
Independent Variables	**Coefficient**	**T-statistic**	**Probability (p-value)**
Trade	0.049363	1.718410	0.0887*
FDI	-0.088632	-0.581470	0.5622
GDP	-0.274476	-3.194224	0.0019***
INF	-0.031076	-1.031117	0.3049
$\boldsymbol{R^2}$	0.055533		
Durbin Watson Stat	0.253028		

Source: Authors' calculation based on EVIEWS

Note: * Significant at10%

** Significant at 5%

***Significant at 1%

Based on Random effects model, the results in Table 4.3 indicate that trade openness and income inequality is positively correlated with coefficient of 0.04936. It is significant at 10% significance level as p-value (0.0887) < 0.10. By holding other variables constant, an increase of 1 percentage point in trade openness, on average, causes an increase in Gini coefficient of each country by 0.0494 percentage points respectively. It is consistent with the result of Pooled OLS. But, there is a contradict result obtained for FDI inflows between Pooled OLS model and REM. The positive relationship between FDI inflows and income inequality under Pooled OLS model turns out to be negative under Random effects model. The estimator with coefficient value -0.0886 shows the negative relationship between FDI inflows and income inequality. Both tests show that FDI inflow is insignificant to the income inequality in the six selected countries at all the significance levels.

GDP growth is found to have negative relationship with Gini coefficient with the negative coefficient value (-0.2745). It is significant at least at p-value less than 10% significant level. In other words, an increase in 1 percentage point of GDP growth, on average, causes Gini coefficient of each country decrease by 0.2745 percentage points respectively, ceteris paribus. The REM results are consistent with the Pooled OLS results as both of them show the negative relationship and statistically significant. For the inflation estimator with coefficient value -0.0311 indicates that there is also a negative relationship exists between inflation and income inequality. This is similar with the results obtained in Pooled OLS model. Both Pooled OLS and REM show that inflation is insignificantly affect income inequality because of the greater p-value at all significance levels.

From Table 4.3, the value of R^2 is 0.056, in a more specific way, the value of 0.056 means that this model can explain Gini coefficient by the total of 5.6%. However, since the values of R^2 is sensitive to the change of the number of variables, thus R^2 cannot be used solely to determine the goodness-of-fit of the model. Durbin Watson

statistic value in REM model is low (0.2530), suggest that there is positive autocorrelation problem occur as the value is approaching zero.

4.2 Discussions

The theoretical framework links between trade openness, FDI inflows, economic growth, inflation and income inequality presented in Chapter 2 is very useful for a coherent interpretation of the empirical findings described in this chapter. These analytical results help to explore how this study's assumptions influence the conclusions.

4.2.1 The Links between Trade Openness and Income Inequality

The result of this study confirms the findings of Wood (1997), Perry and Olarreaga (2006), Bebczuk and Gasparini (2001), Galiani and Sanguinetti (2000), Casacuberta and Vaillant (2002), and Amarante, et al (2011) where trade openness leads to an increase in the level of income inequality in Latin America. However, this result contradicts with the hypothesis of this study which suggests that trade openness decreases income inequality in Latin America.

In Table 4.2, the coefficient of trade is 0.049363, which is also significantly affected income inequality in Latin America at 10% level of significance. It reveals that Gini increases by 0.049 percentage points for every 1 percentage point increase in trade openness. As mentioned in Chapter 2, the most important concept to understand the connection between international trade and income inequality is the SS theorem which is derived from HO model

(Bensidoun, Jean & Sztulman, 2005; Waugh, 2007; Santos-Paulino, 2012; Jakobsson, 2006). However, the SS theorem has been questioned by many researchers. According to Davis and Mishra (2007), it is no longer possible to accept the hypothesis of SS theorem because the assumptions in HO model and SS theorem are somewhat unrealistic to apply in the real world situation. HO model assumes constant technology, factor constraints and unchanged consumer preferences are not realistic in a rapidly changing economy nowadays (Van den Berg, 2012; Feenstra & Taylor, 2012). If a model involves multiple traded goods and countries that are characterized by different and changing technologies, the impact of trade on income inequality may differ from SS theorem (Meschi & Vivarelli, 2007). According to Van den Berg (2012), excluding some assumptions might lead the results away from traditional perspective on international trade towards heterodox perspectives. He observes that many researchers have excluded some assumptions, without ignoring the HO framework can possibly lead to bias and misinterpretation result in their studies. Therefore, he suggests that economists and researchers should stop relying on the neoclassical HO model and be aware of the weaknesses of HO model.

One of the assumptions of HO model is unchanging technologies that used to produce two goods between 2 countries (Feenstra & Taylor, 2012). This assumption is unrealistic as technologies adopted by developed countries and developing countries are improving every day. Latin America transitions from agricultural to industrialization economy in the 1990s have led to massive demand for skilled entrepreneurs and engineers (Kay, 2001; Roser & Cuaresma, 2014). This technological change leads to increase in the demand of skilled labor as firms need to hire skilled labor to produce technology-intensive goods (Lewis, 2006; Katz & Margo, 2013). Increase in the demand of skilled labor will also increase in the wages of skilled labor when compared to unskilled labors, and thus resulted in widen income inequality (Harrison et al., 2010; Bergh & Nilsson, 2010). According to Conte and Vivarelli (2007),

the impact of technological changes on both skilled and unskilled labor employment in low and middle-income countries have proven that technology transfer is associated with increase in income inequality. By using trade flow as a measurement of technology transfer, they conclude that imported skill-biased technology is one of the factors that significantly cause an increase in demand for skilled labor. Skill biased technical change (SBTC) has increase income inequality in Latin America after trade liberalization in the 1990s (López-Calva & Lustig, 2010). SBTC is a shift of production technology that used to increase productivity that favors skilled over unskilled labor (Violante, 2015). Latin America is enjoying SBTC because skill-biased technologies are relatively cheap (Behar, 2013). The cost of machines and equipment that replaced unskilled labors will spread over the long run, and thus reduce the cost of production. As a result of that, reduce demand for unskilled labor caused widening income inequality. In Mexico, under free trade, it's necessary to import capital equipment and materials under SBTC. Firm has to employ skilled labors to operate the machines (Perry & Olarreaga, 2007). As skilled intensive goods and skill biased technical appear to be important nowadays, increase in demand of skill labor tends to have larger effect than increase in the demand for unskilled labor. Therefore, to compete with global market, increase demand in skilled labor has led to widen gap between skilled and unskilled labor as well as income inequality.

The positive effect of trade openness on income inequality can be explained by factor endowments. Under free trade, inequality increases in capital and land abundant countries while decreases in labor abundant (Jakobsson, 2006). According to Jakobsson (2006), trade liberalization in Latin America tends to be accompanied with increment of income inequality (Wood, 1997; Perry & Olarreaga, 2006). The reason is that unskilled labor in Latin America is not abundant factor compared to other developing countries with large pools of unskilled labor (China and India), but relatively abundant in land and natural resources (Spilimbergo, et al, 1997; Wood, 1997; Perry & Olarreaga, 2006).

Goods that produced by local unskilled labor will be relatively expensive compared to China and India. Consumers tend to buy imported unskilled labor-intensive goods from China and India because goods are relatively cheap and consequently reduce consumption on local goods. As a result of that, firm will cut down on hiring unskilled labor and thus widen the income inequality. Besides, most of the Latin American countries are rich in natural resources (which, are in general complementary with capital and skills) and intermediate capital abundant compared to China and India. Latin America specializes in natural resource intensive activities and not in unskilled-labor intensive activities. Some countries like Mexico have begun to show comparative advantage in capital intensive activities since the mid-nineties (Perry & Olarreaga, 2007). In the year 2000, Haiti was recorded capital to unskilled worker ratio of $150 whereas Uruguay's ratio is close to $80 thousand, but the unskilled to skilled ratio goes from 0.12 in Haiti to 1.03 in Uruguay (Perry & Olarreaga, 2007). Given that both of the countries are at opposite scale in terms of capital abundance and skilled-labor in the region, it may not be surprising that different outcome in terms of wage and income inequality happen after trade reforms. Uruguay experiences an increase in wage inequality as they develop in capital to replace lower paid and less skilled worker (Spilimbergo, et al., 1997).

Trade openness may lead to expansion of industries in certain regions of countries and contraction of production in other regions. Firms' productivity in Latin America is very heterogeneous (Busso & Madrigal, 2013). This could have different effects on employment and wages in different regions, which in turn would affect income distribution (Jakobsson, 2006). Under import substitution, domestic firms will prefer to locate close to national centers of final demand and intermediate inputs in order to lower transportation costs (Anderson, 2005). They will encourage other firms to do the same and leads to a concentration of population and economic activity in one region. The effects of trade on the sectoral structure of production may have different effects on

inequality between urban and rural areas. Firms that closer to the center are usually the urban areas because they can produce goods which are formerly imported with lower cost and higher productivity. These firms with a comparative advantage in production, greater trade openness increase the returns to human resources relative to natural resources. This will tend to increase average income gaps between urban and rural areas, because the ratio of human to natural resources is typically higher in urban areas than in rural areas (Anderson, 2005).

Openness to trade is one of the most important driving forces of globalization. As trade barriers decrease; there will be higher exchange flows of goods and services among the trading countries. Greater openness in the developing countries could also affect income inequality by reduce or limit the ability of the government to redistribute income via taxes and transfers system (Anderson, 2005). Low income groups are likely to suffer an income loss when the economy is open to trade. Governments in open economies must engage in some actions of income redistribution in order to reduce income inequality. Income redistribution is refers to the groups who are worse off during trade, are compensated by those who gain (Rodrik & van Ypersele, 1999). Governments should take the redistribution of income from richer to poorer citizens as an independent goal for themselves. Effective redistributive policies (taxes, subsidies and transfers) would redistribute the overall gains in the economy. In the absence of such progressive redistributive income policies, the tax and transfer systems in Latin America accomplish only little redistribution because of the administrative and political economy constraints (Perry, Lopez, Maloney & Serven 2005). The lower fiscal redistribution in Latin America was resulted from low tax revenues and less progressive transfers (Goñi et al., 2011). European countries devote 14.7 percent of GDP to cash transfers, whereas the six Latin American countries devote an average of 7.3 percent of GDP as the lower transfers are primarily due to the differences in revenue collection (Lustig et al., 2011).

Another reason for rising income inequality in Latin America is related to Latin America promotes its outsourcing services exports. Latin America has undergone a transition from industrialization economies to services economies. According to Inter-American Development Bank (2012), Latin America aims to strengthening its local outsourcing services exports, which itself is partly of globalized international trade, to increase trade volume in Latin America. Misallocation of labors in services sectors has caused declining demand for unskilled labor in manufacturing (Ortiz, Crespi, Rasteletti & Vargas, 2014). Another explanation concerning the interaction between trade and capital account liberalization has been received little attention thus far. A sudden inflow of foreign capital may lead to an appreciation and increasing instability of the real exchange rate and therefore shifting the composition of domestic demand towards cheap imports and export is becoming less attractive (Taylor, 2000). These changes stimulate restructuring of production along with labor lay-off, reduction in wages and a greater reliance on outsourcing which in turn further reduces absorption of unskilled labor and raises the income gap (Cornia, 2011).

4.2.2 The Links between FDI inflows and Income Inequality

The empirical results show that FDI inflow and income inequality is negatively correlated and it is insignificant. This indicates that income inequality remains unchanged regardless increase or decrease in FDI inflow and this is contradicting with the dependency theory as discussed in Chapter 2.

The insignificant effect of FDI inflow on income inequality can be well explained by a number of reasons. Evidences show that FDI inflow does not directly exert impact on income gap, but it affects the income gap mainly via

unemployment, industrial structure and foreign trade. Among this, unemployment has the strongest contribution to the deterioration of income inequality (Zhang et. al., 2015). FDI have potential in generating employment opportunities and lowering down the unemployment rate through direct hiring labor for new plants, which in turn affect household income distribution (Mickiewicz, Radosevic & Varblane, 2000). Since the unemployment rate in less developed countries such as Latin America is usually higher than in developed countries, thus FDI inflow can narrowing down the wage gap by offering more employment opportunities in the host country. Bonassi et al.(2006) state that FDI inflow creates more job opportunities to skilled labor than unskilled labor. A strong linkage can be found between unemployment and income inequality (Ukpere, 2011). FDI inflow on inequality may not seem to have a direct contribution to inequality in the countries of Latin America but it contributed indirect through employment and unemployment (Chudnovsky & López, 2008).

Besides, FDI inflow could have indirect effect on the standard of living through their effect on economic growth according to the traditional hypothesis of economic growth (Dong, 2014). This study follows the traditional hypothesis that economic growth oriented policies such as macroeconomic policies argued by McKinnon (1973) will enhance economic growth, improve the living standards and reduce income gaps. The relationship between FDI inflows and income inequality can be broke down into two parts: (1) relationship between FDI inflow and growth and (2) relationship between growth and income inequality (Ucal, 2014). The possible impact of FDI inflow in the host countries' income can be indirect effects. FDI not only have the stimulation effect on growth, but it can also improve the quality of growth, and thus achieve the goal of income gaps reduction (Ucal, 2014). The indirect effect of FDI inflows on the reduction of income gaps is through economic growth which is driven by the improvement of living standards, economic environment as well as the improvement of

technology and productivity. FDI inflows positively affect the economic growth for Latin American countries (Sanches, 2003). From 1990 to 2007, GDP growth for Latin America increased by 36% while FDI as a percentages of GDP has increased to roughly 3% (Reyes & Sawyer, 2011). Not only this, Brazil has become the main FDI recipient in Latin America, with a 30 % increase in the FDI inflows (World Bank, 2015). This sort of increase in FDI is the kind of the trend that indicating more rapid economic growth.

FDI inflow acts as a tool in transferring excellent technology and knowledge that accumulated in developed countries and it has a positive impact on the economic growth as it will lead to improvements in technology and productivity, innovations or human capital to the developing countries (Aghion & Howitt, 1997). FDI inflow also brings improvements to the developing countries through the establishment of local subsidiaries by multinational enterprises (MNEs), the contributions of foreign participation in management and/or the outsourcing between local and foreign firms (Grossman & Helpman, 1991). FDI enhance employment growth and the reduction of household who are living below the line of poverty due to technological diffusion and the increase in the demand for both skilled and unskilled labor. Financial Commission for Latin America and the Caribbean (ECLAC) and the International Labor Organization (ILO) demonstrates the normal provincial unemployment diminishes from 7.3% to 6.7% in 2011, the lowest rate since mid-1990s and pre-crises in 2008. Sustain growth and increase in the demand of labor has contributed to an increase in the regional employment rate in Latin America from 55.6% in 2010 to 56.1% in 2011 according to ECLAC and ILO (2012). In fact, the increase of FDI inflow in Brazil has contributed to the performance of the investment in medium-high technology (Baer & Miles, 2013). As evidence to this technology spillover, human capital has increased and it generates the highest level of workforce demand, therefore improve the region's production structure.

FDI inflow can contribute to both increase and decrease and create an offset in inequality thus these might dedicate to an insignificant result to arise in this study. Due to the increase in FDI inflow, skill-intensive business sectors, skilled labor and urban household gain relative more than the average and since competition increase with the increment of foreign investment, lesser capital gain can be obtain by rich household, thus it reduces the income gap. It is proven that FDI inflow benefit more to low income group rather than middle and high income groups. Through FDI inflows, developing countries like Latin America will get a chance to improve the standard of living. Despite the fact that disparity may ascend in the introductory periods of mechanical advancement yet the gap will inevitably decay as the nation's move to industrialization is finished (Halmos, 2011). There are confirmations propose that intensity among the FDI potential host nations in Latin America does not so much obliterate the endeavors at diminishing imbalance. FDI inflow permits to take after of the exchange liberalization which would advantage moderately copious element of creation. As Latin America is frequently being characterized as less skilled labor abundant countries compared to developed countries, FDI inflow to Latin America would widen income disparity in the source nations (advance nations) and narrow income disparity in the host nations (Latin America) (Herzer, Hühne & Nunnenkamp, 2014). Distributional conflicts may exist in FDI inflows. This applies when spillovers effect on productivity-enhancing go along with widening inequality due to shifts in the relative demand for higher skill labor (Herzer and Nunnenkamp, 2011). Increasing integration of the world economy often widen the gap of inequality. Although globalization may boost the overall income of the population, the benefits are not shared equally as the poor may lose more than the rich in relative and possibly in absolute terms (Halmos, 2011). As globalization increases the elasticity of demand for labor, the bargaining power of labor facing foreign investment is reduced, leading to a reduction in income which is likely to affect the lower income group (Ye & Shen, 2014).

4.2.3 The Links between Economic Growth and Income Inequality

Regarding to the role of economic growth, the empirical results show an increase in GDP growth, the income inequality will be decreased. This negative relationship result is consistent with the hypothesis that previously mentioned economic growth and income inequality has negative relationship. However, this study has not found any positive relationships exist between economic growth and income inequality. Therefore, the hypothesis of positive relationship between economic growth and income inequality in the short run cannot be proved by using the empirical results in this study. This study found out the negative relationship between economic growth and income inequality in Latin America over the time period of year 1995–2012.

As discussed in Chapter 2, the relationship between economic growth and income inequality in Latin America can be proved by using Kuznets (1955) curve theory. He proposes that the structure of production will shift from agricultural sector to industrial sector when an economy is developing. This is evident in the case of Latin America, as part of the periphery of the world economic system, produces the primary materials or raw materials for the great industrial centers such as United States (America, 1950). Two world wars and a great economic crisis have driven the Latin-American countries to the way to industrial activity (Hofman, 2000). The technical progress has been mainly focused in the industrial sector and thus enhances the productivity. The increased productivity of the industrial sector will certainly stimulate the demand for primary products and leads a dynamic factor of the utmost importance in the economic development of Latin America. The increase in productivity is not reflected in prices but in the income. Wages and salaries are marked up as the productivity increases with industrialization since there is lack of labor force in primary sector as people move out to industrial sector (Hofman, 2000). At the same time, Latin America countries such as Argentina

and Peru become more closely integrated into the world economy driven by the industrialization of Western Europe and North America. For such, the new technology of the steamship cut the sailing time between Europe and North America while the latest information have been brought instantly to Latin America in 1990s (Williamson, 2006). The most significant outcome of this integration is that the rapid growth of Latin America exports to the industrializing countries, which need the raw materials and food products.

Industrialization in Latin America in 1990s has become the most critical means of economic development (Kay, 2001). However, this does not mean that primary sector must be sacrificed to further industrial development. In the long run, primary production will gradually obtain that share of the benefits of industrialization progress as it supplies raw materials for the industrial sector besides being exported to those industrializing countries. It is not only promoting final consumption goods but also intermediate and primary goods (Baer, 1984). The export boom increases the value of Latin America products sold by roughly a factor of ten (Bulmer, 2003). The increased in primary productivity will definitely increase the real income of the workers in this sectors (Hofman, 2000). The productivity in agriculture is raised by technical progress, at the same time, real wages is increased by industrialization, and the inequality between incomes at the both sectors can gradually be improved.

Developing countries' economic development can be distinguished into independents and integrationists. The independents include China and India, while the integrationists include Argentina and Brazil. The independents have chosen make technology in which they focus on the build-up of national firms and R&D expenditures. The integrationists rely more heavily on foreign direct investment and technology transfers, the buy decision. This strategic choice has influenced the economies of the developing countries over the past decades (Amsden, 2001). Amsden identifies that Latin America buy rather than make technology. Later on, government has intervened to stimulate the

domestic production of technological knowledge. These attempts showed the mixed results of make and buy decision. Specific public institutions and infrastructure start to be established in several Latin American countries to support the innovation and technological change in their specific industries. In Argentina, the National Institute of Industrial Technology (INTI) is set up, followed by Brazil creates the Aerospace Technology Centre (CTA) (Dimaio, 2009). The governments' efforts to develop R&D capabilities are not only restricted to the manufacturing sector. In order to coordinate the R&D activities in the agricultural sector, Argentinean government creates the National Institute of Agricultural Technology (INTA) while the Brazilian government establishes the Agricultural Research Enterprise (EMBRAPA) (Dimaio, 2009).

In Argentina, state intervention in the economy becomes more active and high GDP and employment growth are achieved (Lustig, 2013). The result of this study in line with Lustig (2013) as he found out the declining income inequality as economic grows in his study period 1992-2010. The fall in the income inequality can be caused by the expansion of employment generated by the fast economic recovery as the result of devaluation of peso and the rise in the influence of labor unions. High GDP growth (around 8% per year since 2003) and a sharp fall in the unemployment rate: from over 20% to 8% in accordance with the decline of Gini coefficient, 0.21% per year (World Bank, 2015). The cheaper peso stimulates output in labor-intensive sectors and thus enhances the economic growth (Gasparini & Lustig, 2011). While, labor union is able to rise up the minimum wages in the private sector. The revival of union activism coincided with a period of falling wage inequality after 2002 (Lustig, 2013).

After growing rapidly in the 1970s, Brazil's economy stagnates in the 1980s, during the Latin American debt crisis but then resumes in 1990s until now (World Bank, 2015). However, the annual growth in per capita GDP is the

lowest in Brazil compared to others. In Brazil, the debt crisis and hyperinflation cause the stagnation of economics. Several governments' policy changes are aided to recover the economic growth during the study period (Ferreira et al., 2010). Trade liberalization policies eliminate a large part of the restrictions against exports of primary commodities (Reis, 2014). During this period, agricultural and mineral exports are the main sources of economic growth. The high levels of income per capita start spreading towards the agricultural sector. Ferreira et al. (2010) discovers that both agriculture and industrial sectors show high speed of convergence, thus suggesting that there are cross-correlations between the processes of growth in both sectors as they move towards the same direction. Hence, this is the evidence that this increase in growth of both sectors helped to reduce inequality.

Panama and Peru continue to grow at a solid rate in the past two decades, with Gross Domestic Product (GDP) increasing between 5 and 10 percent in each country (World Bank, 2015). This growth persisted even as Brazil and Argentina cannot maintain the sustained growth. The governments of Panama and Peru are pushing comprehensive reform agendas and implementing the public policies to bring about economic growth and inclusive prosperity at all levels of society (De Gregorio, 1992). Both of the countries implement financial and economic reforms that permit greater private sector competition domestically and draw growing investment from abroad. This gives the chance of better living standards, especially for the poor. The result of equalizing the income between rich and poor can be achieved accordingly.

The result of negative relationship between economic growth and income inequality can be justified in the case of Costa Rica. Costa Rica is one of the regions with worst economic performance in Latin America. The period of higher growth during this half-century was 1963-1973, with a 4.3% annual growth rate following by a sustained decreased over the periods (World Bank, 2015). The main reason behind slow growth is the slow growth of labor

productivity together with the fall in total factor productivity growth, which could be associated with the stagnation of productivity in the small size of the industrial sector (Rodríguez, 2002). The problem is associated with the industrial sector, which is significantly smaller in relation to GDP of other countries (Tsounta, 2014). The lower productivity in the industrial sector could due to the limitations in infrastructure. The economic stagnation and widening wage gaps are the crucial reasons driving the increase in inequality in Costa Rica (Hidalgo, 2014).

From the results, the component of GDP growth in this study has a strong equalizing impact in the selected countries. Economic growth is the core component in decreasing the income inequality in Latin America in this decade. This result is in agreement with the results of Meschi and Vivarelli (2009) that show the rising of economic growth in Latin America has been accompanied by a decrease in relative income inequality. Firebaugh and Goesling (2004) explain that from the 1970s onward equalizing factors had proved stronger than dis-equalizing factors. It is the reason for the presence of a trend toward lower global inequality. This study has proved that GDP growth is able to equalize the income inequality in Latin America. The results seem in line with the analysis of Perotti (1996); Ravallion (2001) and Stewart and Moslares (2012). The income inequality can be decreased in the long term period as the stable growth performance (Janvry & Sadoulet, 2000). Ravallion (2014) found out that the within-countries income inequality for the developing countries has been falling slightly since 2000.

4.2.4 The Links between Inflation and Income Inequality

Statistical results obtained from E-view based on REM model in this study shows that inflation and income inequality is negatively correlated and it is insignificant. This result are conflict with the hypothesis discussed in Chapter

2 earlier which stated that inflation is positively associated with income inequality based on monetary policy. A low inflation can stimulates economic growth but it has no effect on income inequality (Szeles, 2013). Some macroeconomic shocks significantly affects inequality in a statistically manner but this simply does not apply to inflation, a shock in inflation do not affect inequality (Sudo, Suzuki, Yamasa, 2014).

There are phenomena when Latin America has been playing with a zero sum game which occurs when the country faces the problem of both stagflation and inflation at the same time. Argentina with an average inflation of 25 percent in the fifties experienced an average GDP (Gross Domestic Product) growth rate of less than 2 percent yearly; and with an average yearly inflation rate of 20 percent, Brazil had only an average 6 percent growth rate of its GDP (Baer, 2009). In the time when inflation approaches, the upper and middle income groups will be definitely worst off regardless in absolute or relative terms while at this point of time, lower income groups made a real income gain (Hewlett, 1997). It is because inflation is more favorable to debtors rather than creditors and since most of the poor in developing countries are debtors, a trade-off may exist (Niemi, Ramsay & Whitford, 2009). Romer and Romer (1998) declare that the most common effects of inflation are that it influences redistribution on both creditors and debtors. Since the poor are normally the net nominal debtors, inflation effects on net will definitely benefit them. This is due to unanticipated inflation reduces the real value of nominal assets and liabilities; it will generate real capital losses for nominal creditors and real capital gains for nominal debtors.

Inequality can be classified into income inequality and wealth inequality. Income inequality is the unequal distribution of income across various groups in an economy while wealth inequality can be referred as the unequal distribution of assets within a population. The effect of inflation towards wealth inequality seems to be greater and significant compared to income

inequality (Heer & Sussmuth, 2007). At a certain level, inflation affects all level of income groups equally but in terms of monetary value, lower income group have been badly affected by the increasing inflation rate. When inflation is rising, saving in the form of capital will be relatively more attractive to household rather than saving in the form of money. But the ability of saving in the form of capital may not be desirable to lower income group as there are various forms of transaction cost that needed in order for them to involve themselves in the stock market. These costs have restricted the poor from entering into the stock market. In contrast, middle and high income group will transfer part of their wealth, save it in the form capital and accumulate equity from the stock market to prevent a loss in the value of their money. While inflation might not have an impact on income inequality, it widens the gap of wealth inequality (Heer & Sussmuth, 2007).

"Inflation does not enter the inequality regression significantly" (Johansson & Wang, 2013). Inflation does not show a statistically significant effect on inequality from a macroeconomic perspective based on their results. In this study, inflation is deemed to be insignificant towards affecting inequality. Reducing inflation (especially in single greatest tax on the poor), and implementing macroeconomic stability has allowed the region to benefit from the booming of global markets (Vos, Taylor & De Barros, 2002). Even the countries are experiencing a surge in their economy growth, but there are still around 40% of the citizens living in poverty. Joblessness is higher in 2007 than it was in 1990 and the gap of inequality remains wide (Birdsall & Hakim, 2007). This is somewhat shows that inflation does not contribute to the change in income inequality.

The suspicion on the direction of causality which flow from inequality to inflation rather than inflation to inequality is further reinforces and found to be the stronger in democracies country (Dolmas, Huffman & Wynne, 2000). With the initial existence of inequality, the country has suffered from higher rate of inflation shortly after they re-democratized in 1980s. High income

inequality in Latin America causes the need to redistribute incomes of the lower earning groups via policy implementation but this has led to higher inflation due to the over expansionary monetary policy which in turn contribute to weak economic performance (Sachs, 1989). Increasing money supply in the economy circulations which aims to increase the income of the poor will promote economy growth and encourage lending which contributed to higher aggregate demand leading to higher inflation rate. Not only this, larger inequality and large outstanding nominal government debt in democratic country will find itself harder to commit to lower inflation rate.

Inflation has a direct impact on poverty rather than inequality in Latin America. By potting a scatter plots of average inflation and inequality, Chowdhury (2007) shows that there is no relationship exists between inequality and inflation rate ranges between 5% and 15% but an adverse distribution effect of inflation is found based on extreme inflationary cases. Insignificant between inflation and income inequality arise might because of the conflict between the impact of inflation towards inequality and inflation towards poverty. The changes in the inequality not systematically correlated with inflation and it would be very misleading to assume that whatever reduces poverty will also reduce inequality or vice versa (Warr, 2007). Morley (2006) justifies there is a sharp decline in poverty when every country in Latin America recovers from hyperinflation. Higher inflation could increase poverty by reducing the purchasing power of income and because of its negative impact on the efficiency of investment, higher inflation is indirectly putting growth and employment prospects at risk.

Shahbaz and Islam (2011) indicate that inflation is insignificant in changing the gap of inequality. High inflation often contributed indirectly to inequality via lowering production output and employment through various channels including distortions in relative price signals and effects on allocative efficiency. Employment increase (both skilled and unskilled labor) and wage

inequality drop in Latin America have contributed to unprecedented reduction in poverty and increase in wealth of the population. The average real incomes in the country have also risen by more than 25% and lowest wages increasing considerable faster than the regional average (World Bank, 2013). Besides, inflation rate serves as a tonic for investors which promotes investment among the investors thus reduce unemployment rate by generating more employment opportunities in the countries. Averaging unemployment in Latin America has fallen to near historic lows contrasting sharply with rich nation's rates and its own historical peak a decade ago which is from 11 percent to 6.5 percent (World Bank, 2012). By increasing employment opportunity, it can enhance the income of the poor which is previously self-employed thus reducing inequality.

In Brazil, minimum wages is indexed to inflation to prevent the real value of worker's income from being eroded associated with rising inflation rate. A huge increase in the minimum wage has coexisted with a steadily falling unemployment rate from 12 percent to approximately 5 percent in the past decade thus narrowing the gap inequality, the ratio of the average income and the bottom income fell from 23 to 15, influencing the Gini index of Brazil fell from 0.6 to 0.53 (Binder, 2014). These indirect effects have contributed to the insignificant impacts of inflation towards inequality.

4.3 Conclusion

In sum, the empirical results confirm that negative relationship exists between FDI inflows, GDP growth, inflation and income inequality while trade openness has positive relationship towards income inequality. However, only trade openness and GDP growth statistically significant to the Gini coefficient. Some of the results obtained in this study are inconsistent to the hypotheses and theories. This may due to

the unrealistic assumption that the theories can be to apply exactly to all the selected countries. In the next chapter, the limitations of this study and the recommendations for the future research will be further discussed.

CHAPTER 5: CONCLUSION AND DISCUSSIONS

5.0 Introduction

The conclusion of overall outcomes would be thoroughly elaborate in this chapter. This study uses the panel data to examine the relationship between income inequality, trade openness, FDI inflows, economic growth and inflation for the six selected countries in Latin America (Argentina, Brazil, Costa Rica, Peru, Panama and Uruguay) over the time period 1995–2012. Finally, the policy implications, limitations as well as recommendations for future studies would be discussed.

5.1 Summary of the Study

Income inequality becomes the topic of discussion around the world, especially in Latin America. With an average Gini coefficient of 52, Latin America is one of the most unequal regions of the world. In 1955, Kuznets had published the first study about the relationship between the evolution of income inequality and the economic development. Since then, various studies have been carried out with the purpose of comprehending whether income inequality is affected by trade openness, poverty, level of education, inflation, economic growth etc. However, those researchers have not been able to reach a consensus on how trade openness affects income inequality. Therefore, it is obvious that income inequality fluctuations differ depending on independent variables, regions, study periods and methods of estimation considered in the research.

This study confirms the relationship between income inequality (measured by the Gini coefficient) and trade openness, FDI inflows, economic growth and inflation for the six selected countries in Latin America (Argentina, Brazil, Costa Rica, Peru,

Panama and Uruguay) over the period 1995–2012. The empirical analysis utilizes appropriate panel data techniques. The first empirical test that be used is Pooled OLS model. This test assumes that the set of the selected countries under the estimation have homogeneous characteristics. While, Hausman test suggests that random effects model (REM) is appropriate to use as an estimation model in this study. It will be applied in the following analysis and assuming that each of the selected countries has different characteristics.

Overall, the results suggest that trade openness and GDP growth significantly affect income inequality in the Latin America over the study period by using the both Pooled OLS model and REM results. The trade openness has positive relationship while GDP growth has negative relationship with income inequality. The both test results also reveal that FDI inflows and inflation insignificantly affect the income inequality in Latin America over the study period.

The results show that trade openness significantly affects income inequality in Latin America. In particular, augmenting trade openness increases significantly income inequality over the study period. The results of this study confirmed the findings of several researchers where trade openness leads to an increase in the level of income inequality in Latin America (Galiani & Sanguinetti, 2000; Casacuberta & Vaillant, 2002). However, Hecksher-Ohlin (HO) model and its extended model, Stolper-Samuelson (SS) theorem cannot be verified by the empirical results in the six selected countries in Latin America. This is because the assumptions in SS theorem are proven to be unrealistic to apply in a real world situation (Davis & Mishra, 2007). This result contradicts the hypothesis of this study which suggests that trade openness decreases income inequality in Latin America. Particularly, Latin America is said to be trade liberalization tends to be associated with increment of income inequality. The skilled labor is more being demanded in Latin America in order to compete with the global market. Thus, the widen income gap appears between the skilled and unskilled labors in Latin America.

Regarding to FDI inflows, it is demonstrated an insignificant relationship with income inequality for the both tests. Same goes to inflation with income inequality. Both of the variables conflict with the hypotheses that discussed earlier due to the insignificant results. Insignificant results indicate that the indirect effect of the variables on the income inequality. As justified in Chapter 4, FDI inflows insignificant affect the income inequality in Latin America mainly due to the indirect effect. FDI Inflows seem to be more likely to act as mediation for both economic growth and income inequality. Besides, this study assumes that full employment is achieved in all the countries and thus neglects the factor of unemployment rate. Thus, the wage inequality can't be fully described by FDI inflows. In order to achieve significant result, the distributional effect of the FDI should be in accordance with certain level of education and economic development.

The macroeconomic factors can significantly affects income inequality in a statistically manner, but this simply does not apply to inflation as it is insignificant to the income inequality based on the empirical results. It is possible to believe that Latin America has been playing with a zero sum game which occur when the country faces the problem of both stagnant and inflation at the same time because lower income group will gain while the upper and middle group will be worst off (Hewlett, 1997). In the time when inflation approaches, the upper and middle income groups will be definitely worst off regardless in absolute or relative terms while at this point of time, lower income groups made a real income gain

In particularly, a trade-off exists. The suspicion on the direction of causality which flow from inequality to inflation rather than inflation to inequality is further reinforces and found to be more significant in democracies country. High income inequality in Latin America drive up the needs of income redistribution of the lower earning groups but this cause the higher inflation. Over expansionary monetary policy to help this lower income groups which in turn contribute to weak economic performance. As discussed in Chapter 4, the relationship between inflation and

unemployment rate has acted as a barrier and provide indirect effect with income inequality.

The empirical results show negative relationship between economic growth and income inequality in the both Pooled OLS and REM. This is consistent to the hypothesis. The way to industrialization and the technical progress has stimulated the demand for primary products and leads a dynamic factor of the economic development of Latin America. The primary sector will gradually obtain that share of the benefits of industrialization progress as it supplies for the industrial sector besides being exported. The increase in productivity is not reflected in prices but in the effect of income. Wages and salaries rise as the productivity increases with industrialization. The income inequality is thus decreased. Since GDP growth is significantly affect income inequality, the component of GDP growth in this study has a strong equalizing impact in Latin America. It is proved by the presence of a trend toward lower income inequality in Latin America.

This study's objectives have been achieved as there are evidences about how trade openness affects income inequality in a region by taking economic growth, FDI inflows and inflation into account. The income inequality is severe and it affects other social and economic features.

5.2 Implications of the Study

This section will discuss general macroeconomic policies to help reducing income inequality in Latin America.

5.2.1 Growth Strategy

Based on the obtained results, increase in GDP growth caused decrease in income inequality. Government should adopt growth strategy to stimulate economic and then emphasize on stabilizing the economic growth. It's necessary to have both rapid and stable growth in reducing income inequality. According to Morley (2001), rapid but unstable economic growth tends to put pressure on prices and eventually lead to inflation. Income inequality will be worse off because inflation hits harder on the low income groups than the high income groups (Albanesi, 2006). The reason is that low income groups hold more currency as a fraction of their total income when comparing to high income groups. Inflation weakens the bargaining position of low income groups due to decrease wage and increase in labor supply (Holden, 2004). Hence, low income groups are more vulnerable to inflation compared to high income groups.

Two types of complementary goals for growth strategy to promote economic growth and stability are labor-intensive growth strategy and equity-increasing strategy. Labor-intensive growth strategy is a labor protection strategy that used to reduce the excessive supply of labor and increase the demand for unskilled labor (Rachleff, 2005). It allows economy to absorb unskilled labor as much as possible. Equity-increasing strategy is used to support economic development of rural areas in Latin America (Morley, 2001).

5.2.1.1 Labor-intensive Growth Strategy

Latin America should focus on improving the quality of education as expanding education tends to reduce skill differentials and income inequality. According to the Socio-Economic Database in Latin America and the Caribbean (SEDLAC), the problem of excessive supply of unskilled labor in

Latin America is one of the reasons of income inequality occurred. Government should expand education spending to help reduce the excessive supply of unskilled labors and create job opportunities to take care of the demand of unskilled labors.

Expanding education spending could be an efficient tool to equalize skill differentials in Latin America over the long run. Improving the educational level could increase labor productivity and reduce the waste of human resources. It's possible to predict that a number of potential scientists or engineers are working in agriculture sector just because they did not get a chance to go through formal education to know their ability. In today's world, increase investments in R&D and adoption of new technologies are essential to boost productivity. Quality education and professional training is necessary to labor as human capital is the key to long run economic development. Real life examples of Latin America and East Asia, East Asia implemented such policy to expanding educational level in improving primary and secondary education, while Latin America is improving primary and universities education. It's observed that East Asia has successfully narrowed income inequality but not to Latin America. Results showing that invested in primary and universities did not expand enough to absorb the unskilled labors, and thus excessive unskilled labors and further drop of wage for unskilled labors (Morley, 2001).

Government should create job opportunities to absorb excessive unskilled labors in Latin America's labor market. Construction and agriculture sectors in Latin America are mainly using a large number of unskilled labors. Government should encourage these sectors to provide in-house training by giving incentives and subsidies to firms. By doing so, labor's knowledge and skills will be improve and consequently reduce in skill differentials between skill and unskilled labor and income inequality. Thus, reduction in supply of unskilled labors and increase in demand of unskilled labors have to be implemented simultaneously to achieve the best outcome.

5.2.1.2 Equity-increasing Growth Strategy

Government of Latin America is recommended to implement equity-increasing growth strategy on public social expenditure in rural areas in Latin America. Government should aim to stimulate economic growth by improving infrastructural such as transportation, communications, healthcare, education, social security and so on. Adequate spending on infrastructure is likely to have positive effect on economic growth and income equity (ECLAC, 2011). As a result from that, the gap between the labors of rural and urban areas will be narrowed.

5.2.2 Inflation Targeting

Latin America, taken as a whole, should implement inflation targeting to reduce inequality. Inflation targeting helped to stabilize the inflation rate and achieves interest rate stability. As discussed in Chapter 4, inequality classified into income inequality and wealth inequality. The effect of inflation towards wealth inequality is likely to be greater than income inequality. As far as the inequality is concerned, higher interest rate will reallocate income and wealth from creditor to debtor and thus, reduce inequality. Government could set interest rate above-target or below-target inflation based on economic condition. Brazil and Peru, which use inflation targeting, have set the interest rate below-target inflation failed to reduce inequality (Hammond, 2012; Roger, 2009).

5.2.3 FDI Promotion

Latin America should promote FDI in order to reduce income inequality. Latin America has the factors that attract FDI such as abundant natural resources, lower labor cost, political stability and trade liberalization (Petras, 2011; Perry & Olarreaga, 2006). Therefore, government should aggressively promote FDI as it can stimulate growth and reduce poverty in long run.

Government can base their FDI promotion strategy on agriculture sector as it's important to Latin America (FAO, 2010). There are many countries in Latin America still depending on agricultural trade such as Paraguay (20.4% of GDP), Guyana (20.3% of GDP), Bolivia (13.6% of GDP) and Colombia (9.3% of GDP) (Bonilla, 2000). Attract higher FDI in agriculture sector tends to create employment opportunities. Increase demand for unskilled labor will reduce in income inequality between skilled and unskilled labor. Besides, FDI is benefit to Latin America because its not only brings capital to economy but also transfer new technologies, skills and knowledge to the country. Improve in skill development will transform unskilled labor to skilled labor.

5.2.4 Progressive Tax and Benefit Systems

Government of Latin America should consider improving their tax systems more progressive to achieve a lower Gini index. Tax and benefit systems is one of the important key to promote equity. Government of Latin America could collect proportionately more tax from high-income groups and redistributes welfare benefits to low-income groups. Raising tax revenue resulted in a decline income inequality. In the case of Latin America, tax revenue was recorded as 21.3% in 2013, whereas OECD countries were 34.1% in 2013 (OECD, 2015). According to Goñi et al. (2008), the tax systems decreased the average Gini by 2 percentage points in Latin America from 0.52

to 0.50 in the mid-2000s. Compared with a decrease of roughly 20 percentage points in European countries from 0.46 to 0.27, tax systems in Latin America seems to be less effective (Bastagli, Coady & Gupta, 2012).

5.3 Limitations of the Study

There have some limitations in this research that needed for further study to encounter the inadequacy.

This study only have 6 countries observed over 18 years, therefore GMM (General Method of Moments) cannot be applied efficiently. GMM designed for "small T and large N" and it is used to capture dynamic effects (Baum, 2013).

Income inequality is affected by globalization through FDI, trade, educational, technology and many others. But this study only focused on 2 factors which are trade openness and FDI inflows. Different proxy used may have contributed to different outcome of the results. From the factors that this study focused, it may be no strong effect on the income inequality such as FDI inflows are proven to be insignificant in affecting income inequality. There might have other factors which may have stronger effect on the income inequality in Latin America.

Another limitation in this study is that the geographic factor, neither within (urban and rural) nor across (develop and developing) the country is taking into the consideration. Due to geographic factor may contribute to the changes in inequality and by including only 6 countries (Argentina, Brazil, Costa Rica, Uruguay, Peru and Panama) representing Latin America, the results obtained in this study are somehow insufficient in explaining the relationship between trade openness, FDI inflows, economic growth, inflation and income inequality in the entire Latin America.

5.4 Recommendations for Future Research

As mentioned previously, this study would like to suggest future researchers to use Generalized Method of Moments (GMM) instead of Fixed and/or Random Effect Model in order to capture the dynamic effects of the related variables in Latin America. Dynamic effect may have a large contribution in affecting the variables thus influencing the gap of inequality. Not only this, GMM allows the inclusion of lagged values of inequality, this can help to control the longer term impacts of the independent variables and those omitted variables that changes over time which could alter the outcomes of the results. However, additional countries must be included in the studies if GMM is chosen to be used to ensure that the model will capture the effects precisely.

Future research may also intensify the results of this study by using other proxy rather than FDI inflows and economic growth in examining the impacts on inequality. For example, educational can be used as one of the factors in investing the gap of inequality. By promoting equal access to education and implementing policies to increase graduation rate from upper and tertiary education contributed to a significant reduction in inequality (Hoeller et al., 2014).

Even though this study has been successfully filled up the gap in examine the impacts of trade openness and income inequality, but there still some area that has been underexplore. As a recommendation, future research can deepen the study by investigating the impact of differential effects across urban and rural areas in the six countries. This is because there may be different trade transmission channels in operation for household income distribution which may work in different ways based on the geographic location (Castilho et al., 2012). Not only does trade-connive changes in the income but the level of income and inequality of the population may also differ across the regions based on the household composition as well as their occupational status. Inequality in developed countries and developing countries may differ in a way that the gap of income inequality of developing countries, which are

well endowed with unskilled labor should have decline with trade as trade will increase the real returns of unskilled labor (Harrison et al., 2011).

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will+move+in+the+same+manner&source=bl&ots=Tk4l5FQGTr&sig=GkCD_66Cw2U2ekGOF2DnvZEscz8&hl=en&sa=X&redir_esc=y#v=onepage&q=modernization%20theory%20developed%20and%20developing%20countries%20will%20move%20in%20the%20same%20manner&f=false

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APPENDICES

Appendix 3.1 Data set

Country	Code
Argentina	1
Brazil	2
Costa Rica	3
Panama	4
Peru	5
Uruguay	6

	GINI	TRADE	FDI	GDP GROWTH	INFLATION
1-95	48.9	19.77150099	1.794618031	-2.845209615	3.165123395
1-96	49.52	21.50635817	2.107717358	5.526689823	-0.052375492
1-97	49.11	23.3361447	2.582121968	8.111046774	-0.463913134
1-98	50.73	23.34994435	2.013249559	3.850178866	-1.705279637
1-99	49.79	21.38265679	6.984369397	-3.385457054	-1.836558378
1-00	51.06	22.62250234	3.026178952	-0.788998929	1.03728709
1-01	53.34	21.85242285	0.665503623	-4.408839696	-1.095767705
1-02	53.79	41.7527513	1.738495253	-10.89448481	30.55520403
1-03	53.54	40.64468975	1.052311129	8.837040776	10.49570304
1-04	50.18	36.97140911	2.250303691	9.029573321	7.925736353
1-05	49.27	36.79644458	2.36207774	9.198488983	10.62015555
1-06	48.26	36.18660748	2.0935938	8.363924404	15.28384967
1-07	47.37	36.17108628	1.962979423	8.002890988	17.63825996
1-08	46.27	36.72246659	2.395436098	3.102113255	21.2137227
1-09	45.27	30.56244596	1.061347168	0.050512782	9.884504608
1-10	44.5	32.53587924	1.695624443	9.136242015	17.51368529
1-11	43.57	33.92136319	1.922074004	8.554912749	17.20458279
1-12	43.57	29.86297529	2.47712554	0.946197195	18.05514097
2-95	59.57	16.03180654	0.631899577	4.416831993	93.52200434
2-96	59.89	14.93284674	1.333837304	2.15	17.08526917
2-97	59.8	15.84107706	2.255508754	3.374938815	7.645002855
2-98	59.61	15.86498597	3.781934717	0.035512204	4.235903534
2-99	58.99	20.22715514	4.869282526	0.255597103	8.476449264
2-00	59.16	21.71995842	5.084403071	4.305745715	6.177839772
2-01	59.33	25.67834696	4.056733444	1.314896121	8.966179682
2-02	58.62	26.67960011	3.290262932	2.655974267	10.55580533
2-03	58.01	27.06206307	1.836034126	1.146749064	13.72647562
2-04	56.88	28.97323151	2.736785058	5.713916916	8.036217296

2-05	56.65	26.64834858	1.752463405	3.156352388	7.212998053
2-06	55.93	25.83424317	1.779575144	3.955415269	6.151440178
2-07	55.23	25.20866345	3.261538621	6.095454977	5.864530134
2-08	54.37	27.13633384	3.067199281	5.169299014	8.334949712
2-09	53.87	22.11829707	1.943041863	-0.32824804	7.185146468
2-10	53.48	22.77449978	2.4891714	7.533615453	8.228535058
2-11	53.09	24.5117143	2.888472914	2.732509243	6.968884752
2-12	52.67	26.62092387	3.384529937	1.031803648	4.929357704
3-95	45.71	77.92092082	2.873995375	3.920889571	22.192483
3-96	46.54	82.10111396	3.605013604	0.886582088	15.79779531
3-97	45.62	85.33520455	3.181625739	5.578186399	14.89469783
3-98	45.67	97.53284273	4.347544418	8.397847841	12.12561528
3-99	47.67	97.67202282	3.921543248	8.222200687	14.97382884
3-00	47.44	94.38912452	2.56210394	1.8008246	6.976533258
3-01	51.1	86.0082898	2.806566457	1.076396317	8.600390453
3-02	50.89	90.0196377	3.914395232	2.902185091	9.182287525
3-03	49.93	95.20438265	3.282795494	6.404510783	8.287662869
3-04	48.92	95.73671807	4.268761709	4.259452774	11.84562962
3-05	47.77	102.474408	4.312780395	5.886377313	10.62363512
3-06	49.31	104.4063653	6.52161479	8.779640959	10.99948044
3-07	49.49	102.2271431	7.203462219	7.935340515	9.38402165
3-08	49.14	100.6267316	6.96666907	2.731620422	12.39740897
3-09	50.97	83.97694187	4.582637893	-1.015718862	8.380179032
3-10	48.1	79.09772777	4.037735505	4.954320527	7.960913667
3-11	48.6	79.24548262	5.277045412	4.510220598	4.535142493
3-12	48.61	78.74934474	5.907829096	5.133850711	4.088459
4-95	57.81	198.766775	2.820606873	1.751678624	0.466707152
4-96	58.02	165.6096802	4.457150213	2.810584059	14.68685087
4-97	58.23	175.8101944	12.88476795	6.460990549	1.608157672
4-98	57.48	160.2835582	11.0048022	7.341501753	0.999443779
4-99	56.46	134.2772099	6.595497674	3.917206421	0.841066126
4-00	57.66	142.394045	5.368960028	2.715373567	-1.248207547
4-01	57.13	138.6440822	3.955960195	0.574272925	1.029042638
4-02	56.59	129.7447932	0.803428832	2.228887218	1.671191772
4-03	56.37	122.139919	6.320941453	4.205763358	1.131104926
4-04	55.06	131.5170707	7.187237734	7.52208031	1.965003678
4-05	53.99	144.5466126	7.141425311	7.191279079	1.748321844
4-06	55.06	146.1924491	17.13427088	8.527761146	2.106279836
4-07	52.97	145.382281	9.57963062	12.11266105	9.936909611
4-08	52.63	148.9969458	9.864169748	9.146904398	7.938353164
4-09	52.03	138.7340454	4.187061959	3.974164892	0.201634704
4-10	51.91	139.6875141	8.846710465	5.851873793	4.999218943
4-11	51.83	158.3468839	13.21170406	10.77019485	4.239267023

4-12	51.9	154.7536434	8.835447173	10.24710466	3.479949
5-95	39.83	31.64137934	4.912766862	7.411635008	13.7774978
5-96	39.83	32.25462215	6.428325672	2.799117578	9.879384779
5-97	34.78	34.00901158	3.75840063	6.476802058	7.339880153
5-98	56.22	33.23259713	3.01513094	-0.391710242	5.928346318
5-99	56.66	33.39695217	3.934461953	1.494863143	2.976276458
5-00	50.93	35.57896778	1.589628075	2.694311073	3.763042887
5-01	51.87	34.80052543	2.217894271	0.617831087	1.102594235
5-02	54.07	34.82733679	3.959115075	5.453764602	0.32994208
5-03	53.84	36.67111301	2.261417154	4.164850559	2.963968231
5-04	48.69	41.03275297	2.396270099	4.9582783	5.623102975
5-05	49.28	46.86635108	3.43995213	6.285172088	2.101955867
5-06	49.07	50.83078142	3.939880548	7.528816844	8.291916816
5-07	49.62	53.87594206	5.37421873	8.518441947	2.392885553
5-08	46.89	56.46560286	5.695124713	9.143148205	1.944673847
5-09	46.24	46.41854353	5.305802594	1.04923237	1.562127742
5-10	44.92	50.01229642	5.692477494	8.45074688	6.008539289
5-11	45.67	55.24166811	4.49387649	6.452215996	5.166309438
5-12	45.33	51.75004111	6.186922877	5.950346345	2.084765446
6-95	42.11	38.09767484	0.811497222	-1.447598978	41.04832689
6-96	42.66	39.52843646	0.666814008	5.57795777	26.43173777
6-97	42.73	37.70639705	0.527331393	8.547683221	27.48516608
6-98	43.81	35.64001538	0.646421115	4.518890092	12.38390549
6-99	44.1	33.38644895	0.981072956	-1.939212155	4.326096183
6-00	44.39	36.71373813	1.176821582	-1.929930632	3.539308507
6-01	46.17	36.30951263	1.420153754	-3.844129957	4.826618329
6-02	46.66	40.02906731	1.423941363	-7.73200722	12.61627662
6-03	46.22	51.75919956	3.456918483	0.80528392	16.54163515
6-04	47.13	61.47668808	2.428477141	5.004160357	10.105056
6-05	45.87	58.87769633	4.76088674	7.460132112	0.677868382
6-06	47.2	61.9715745	7.703730306	4.098577362	6.533334632
6-07	47.63	59.21044784	5.803952768	6.541510848	9.417473476
6-08	46.27	65.20809501	7.053806523	7.176144662	8.023536411
6-09	46.28	55.36766973	5.261071029	2.351258511	5.581524585
6-10	45.32	53.50801286	5.635303137	8.404087427	4.656468691
6-11	43.43	54.23127631	5.694922785	7.341183557	8.97758709
6-12	41.32	56.72563944	5.438083067	3.676367388	7.370485115

Appendix 3.2 Eviews Result Pooled OLS

Dependent Variable: GINI
Method: Panel Least Squares
Date: 07/16/15 Time: 13:04
Sample: 1995 2012
Periods included: 18
Cross-sections included: 6
Total panel (balanced) observations: 108

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	49.64730	1.163036	42.68766	0.0000
TRADE	0.025438	0.014533	1.750365	0.0830
FDI	0.114656	0.248442	0.461499	0.6454
GDP	-0.290160	0.139093	-2.086084	0.0394
INF	-0.018516	0.048692	-0.380272	0.7045

R-squared	0.081815	Mean dependent var	50.37815
Adjusted R-squared	0.046157	S.D. dependent var	5.315013
S.E. of regression	5.190902	Akaike info criterion	6.176882
Sum squared resid	2775.383	Schwarz criterion	6.301055
Log likelihood	-328.5517	Hannan-Quinn criter.	6.227230
F-statistic	2.294444	Durbin-Watson stat	0.256535
Prob(F-statistic)	0.064275		

Appendix 3.3 Eviews Result Random Effects Model

Dependent Variable: GINI
Method: Panel EGLS (Cross-section random effects)
Date: 07/16/15 Time: 13:14
Sample: 1995 2012
Periods included: 18
Cross-sections included: 6
Total panel (balanced) observations: 108
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	49.00312	3.906932	12.54261	0.0000
TRADE	0.049363	0.028726	1.718410	0.0887
FDI	-0.088632	0.152428	-0.581470	0.5622
GDP	-0.274476	0.085929	-3.194224	0.0019
INF	-0.031076	0.030139	-1.031117	0.3049

Effects Specification	S.D.	Rho
Cross-section random	8.517103	0.8826
Idiosyncratic random	3.106119	0.1174

Weighted Statistics

R-squared	0.126320	Mean dependent var	4.314531
Adjusted R-squared	0.092390	S.D. dependent var	3.203838
S.E. of regression	3.052250	Sum squared resid	959.5719
F-statistic	3.723023	Durbin-Watson stat	0.752783
Prob(F-statistic)	0.007162		

Unweighted Statistics

R-squared	0.055533	Mean dependent var	50.37815
Sum squared resid	2854.824	Durbin-Watson stat	0.253028

Appendix 3.4 Eviews Result Hausman Test

Cross-section random effects test equation:
Dependent Variable: GINI
Method: Panel Least Squares
Date: 07/16/15 Time: 13:18
Sample: 1995 2012
Periods included: 18
Cross-sections included: 6
Total panel (balanced) observations: 108

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	48.85801	1.885931	25.90657	0.0000
TRADE	0.051886	0.030524	1.699803	0.0923
FDI	-0.090896	0.152486	-0.596093	0.5525
GDP	-0.275799	0.086171	-3.200586	0.0018
INF	-0.031220	0.030147	-1.035580	0.3029

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.687198	Mean dependent var	50.37815
Adjusted R-squared	0.658471	S.D. dependent var	5.315013
S.E. of regression	3.106119	Akaike info criterion	5.192647
Sum squared resid	945.5017	Schwarz criterion	5.440992
Log likelihood	-270.4029	Hannan-Quinn criter.	5.293342
F-statistic	23.92189	Durbin-Watson stat	0.765641
Prob(F-statistic)	0.000000		

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.458360	4	0.9774

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
TRADE	0.051886	0.049363	0.000107	0.8070
FDI	-0.090896	-0.088632	0.000018	0.5905
GDP	-0.275799	-0.274476	0.000042	0.8378
INF	-0.031220	-0.031076	0.000001	0.8448