

FOREIGN DIRECT INVESTMENT AND BALANCE OF PAYMENTS IN LATINAMERICA (1990-2011)¹

Douglas Alcantara Alencar²

Eduardo Strachman³

ABSTRACT

When the world economy is in an upswing, international liquidity expands and thereby also capital flows toward the peripheral countries. However, when these countries engage in speculative finance, they become vulnerable because a change in expectations can generate an outflow of capital, causing a crisis and also seizures (or at least this last measure is feared by many agents of those indebted countries, as was seen during the debt crisis of the 1980s and also in some recent seizures of Argentinian assets, in the USA). This unstable process is consistent with the Minskian (1977) hypothesis of financial instability, applied to an economic open environment. Empirically, in the 1990s there was an expansion of international liquidity and the reintegration of Latin America in the international financial system, especially after the Brady Plan. Several countries in the region have then resorted to external financing. However, from the Mexican crisis of 1995 on, capital flows consisted mainly of Foreign Direct Investment (FDI). Some authors, including Kregel (1996) and Laplane and Sarti (2002) began to question whether FDI and other capital flows, besides current account results, could constrain economic growth, more or less following in broad terms (not recurring to mathematical or more elaborated statistical data) an analysis of Balance of Payments restrained growth. That is to say, if FDI and other capital flows were staunched and if this is accompanied by capital outflows that originated from this FDI in previous periods, there could happen a Balance of Payment constraint to economic growth. The aim of this work is to identify whether there is a relationship between foreign direct investment (FDI) and other flows, on the one hand, and long-term growth, on the other, in Latin America, in the period between 1990 and 2011.

Keywords: capital flows, economic growth, external constraint

JEL: E12

1. INTRODUCTION

When the world economy is in times of expansion, the international liquidity also tends to expand and capital flows also are directed toward the peripheral countries. However, latter this speculative finance turn these countries vulnerable to reversals in these flows because changes in expectations can reverse the flows of capital and cause crises. This process is consistent with Minsky's (1977) financial instability hypothesis, if applied to an open economic environment.

In the 90's there was an expansion of international liquidity and a reintegration of Latin America into the international financial system, especially after the Brady Plan. Several countries in the region have then resorted to external financing. However, from the Mexican crisis of 1995 on, capital flows to Latin America consisted in great part of foreign direct investment (FDI). Some authors (Kregel, 1996; Laplane and Sarti, 2002) began to question whether these FDI flows could limit economic growth, from their impact in the Balance of Payments.

The purpose of this paper is to analyze whether economic growth in Latin America has been hampered by external constraints, especially through the Balance of Payments. Through the model created by Thirlwall (1979), one can basically express this constraint as follows: $y = x/\pi$, where y is the economic growth compatible with the Balance of Payments equilibrium; x is the export growth rate; and π

¹ Este trabalho contou com o apoio da FAPEMIG

² PhD Candidate in Economics, Economics Department, Federal University of Minas Gerais (UFMG, Brazil). e-mail: dougsky@gmail.com.

³ Associate Professor, Department of Economics, São Paulo State University (Unesp). e-mail: edstrach@fclar.unesp.br.

is the income elasticity of the demand for imports. Thus the real rate of domestic income growth in any country in the long run is equal to the volume export growth divided by the income elasticity of the demand for imports. However, this approach does not satisfactorily explain the experience of developing countries, so that other economists, some working with Thirlwall himself, have enriched this seminal model in order to include other components of the Balance of Payments, such as capital flows (Thirlwall & Hussain, 1982), external debt constraint (Moreno-Brid, 1989), or again external debt constraint plus interest payments (Moreno-Brid, 2003), as well as an approach without external debt constraint (Lima & Carvalho, 2009). We included in the model proposed by Lima & Carvalho (2009) a new specification which includes the analysis of FDI. We added to the model presented in Alencar and Strachman (2014) a new specification, which includes the analysis of FDI

Latin America is chosen because it is one of the largest regions in the world and one of the most frequently and strongly stricken by Balance of Payment crises. The research questions underlying the analysis can be summed up as follows: was Latin American economic growth constrained by the Balance of Payments during the period 1990-2011?

The aim of this work is to identify whether there is a relationship between foreign direct investment (FDI) and long-term growth in the period between 1990 and 2011 in Latin America. To achieve this objective, we built on a survey of the many versions of the theories on the subject, with a change in the particular approach proposed by Alencar and Strachman (2014). The data required for the empirical analysis are from the Economic Commission for Latin America and the Caribbean (ECLAC) and from the WDI of the World Bank and WEO of the IMF. The data which were extracted from those sources are: imports and exports of goods and services, both in local currency and in the current real exchange rate (in U.S. dollars), foreign direct investment in current dollars; income from foreign direct investment in current dollars, and prices for U.S. consumers.

The econometric approach used in this work is the panel data methodology. We had chosen this approach because we have data for several countries for a quite large time span. After we collected the data, the first step was to estimate the income imports elasticity through panel data estimation. Afterwards, we performed the test of Alonso (1999), which consists of regressing the effective income in terms of growth rates and comparing it with the estimated income attained through the model, using the methodology of vector error correction (VEC). If the effective income in terms of growth rates is equal to the estimated income calculated through the model we can confirm statistically that the growth of the economy was compatible with (and constrained by) the Balance of Payment. The result that we found in this research confirmed the hypothesis of some authors (Kregel, 1996; Laplane and Sarti, 2002) which questioned whether the FDI flows would be impairing economic growth, from its impact on the Balance of Payments.

In addition to this introduction, this article presents five sections. The second section consists of the theoretical framework, where we show the relationship between capital flows and possible constraints on economic growth. In the third section, we adapt the approach proposed by Alencar and Strachman (2014), which incorporate the FDI as a limiting factor on economic growth. Subsequently, in the fourth section, we explain briefly the methodology used for data processing. In the fifth section, we make the empirical analysis of the data, and finally, in the last section, we make brief closing remarks.

2. SOME THEORETICAL REMARKS

According to Minsky (1977), the behavior of capitalist economies depends on firms gross profits growth rate. In a capitalist economy, this rate is directly related to expectations regarding the prospective return for investments, which makes possible the ex-post payment of obligations regarding contracts. Thus, to incur in new debt to finance new investment depends on how much is expected to be the cash flow resulting from these debts, so that it can pay the previous obligations or permit to refinance (part of) them, and also, if possible, provide profits both to the investor and the lender, sometimes merged into a single agent.

“The behavior of our economy therefore depends upon the pace of investment. In a capitalist economy the valuation that is placed upon capital-assets, which determines current investment, and the ability to fulfill contractual commitments, which determines financing possibilities, depend critically upon the pace of gross profits. Gross profits in turn are largely determined by investment. Thus the ability to debt-finance new investment depends upon expectations that future investment will be high enough so that future cash flows will be large enough so that the debts issued today will be repaid or refinanced” (MINSKY, 1977:24).

A highly indebted economy is dependent on revenue streams and on conditions of refinancing commitments. An expectation that in this economy there will be no profits deemed appropriate to these commitments shall lead to a drop in investments and in the financing of these investments and other productive expenditures, with these resources searching for other more profitable applications. Thus, in an open economy, a key issue relates to whether the economy as a whole will be able to meet its external commitments, allowing agents to pay contracts ex-post as their expectations ex-ante. This same idea can be applied to flows of foreign direct investments: these will continue to grow if the expected profitability surpasses the contracted payments related to them or, at least, the rate of future profitability is sufficient for refinancing the existing contracts. Thus, a low rate of growth is inconsistent, except in very particular situations, mainly theoretical, with the manner in which the investment is determined in an uncoordinated economy in which capital assets are partly financed with debt. After all, in a non-coordinated, capitalist economy, expectations tend to fluctuate (Keynes, 1936). The tendency to transform economic performance in investments, and vice-versa, since economic growth is also strongly determined by investments, is the basic cause of instability in a capitalist economy (Kalecki, 1954; Minsky, 1986).

Minsky (1977) argue that there is a difference between low risk (hedge) and speculative finance. On the one hand, the first occurs if the expected cash flow from the operations are expected to be sufficient to repay the payment commitments for the loans. On the other hand, speculative finance happens when it is not expected that the cash flow from operations will be enough to pay the incurred obligations without refinancing. Finally, Ponzi finance is when the expected returns are not sufficient to pay at least the interests, let alone the principal. Ponzi finance should thus imply –just for the maintenance of the debt without bankruptcy, if the actual conditions are reasonably similar to those expected when the finance was incurred – a debt that grows exponentially as the debtor does not pay the principal and has to go even further into debt just to pay part of the interests. Thus, as the speculative loans become more numerous than the hedge loans, potential debtors with greater risk aversion begin to change their portfolio, even refinancing and impacting their own investments and other productive expenditures and, consequently, also the total demand and market expectations approaching the system to a crisis (Minsky, 1977). Another possibility in a similar direction is a concomitant pessimistic change in the economy’s growth expectations.

If a country engages in speculative finance, it will be vulnerable in three fronts: first, a possible rise in interest rates may cause an increase in its payment commitments in relation to revenues, transforming some hedge funds in speculative or even Ponzi, chiefly if the rising interest rates and the falling demand that usually accompanies them are too strong (Keynes, 1936). Second, if the relevant assets have longer maturities than their liabilities, an increase in short-term interest rates will result in a greater decline in the market value of these assets compared to their related liabilities, making them less attractive. Third, as we already explained about the prospects of acceptable liability structures, they are subjective and a reduction of revenues in relation to payment commitments in any part of the economy can result in a rapid and broad reassessment of some financial structures (Minsky, 1977). Implications of normative orders follow the financial instability hypothesis. There is no perfect fit between expectations and expenditures, except as a transitory phenomenon. Moreover, policies that work in certain financial systems could not be effective in other situations, such as the fragile finances that have dominated some developing economies, as Brazil, Mexico and Argentina. In these last cases, there was no structural and institutional means of stabilizing finance, expenditures and expectations, because if there were such

means a higher leverage could be sustained in the long term, as in the cases of Japan and Korea, until the 90s.

Another implication is that to reduce instability, we must create a responsible and supervised financial system, in which the bias of some institutions to participate in speculative or Ponzi finance schemes would be hampered, reducing the risk of an abrupt and widespread transformation of hedge funds into speculative or Ponzi finance (MINSKY, 1977; BELLUZZO, ALMEIDA, 1989).

For Minsky (1993), the obligations of the productive units – be them firms, governments or financial institutions – can be traded in financial markets, depending on the cash flow that these units produce. The same applies to international obligations, with the difference that in this case, in the one hand, receipts can be denominated in local currency and, on the other hand, obligations can be set in a foreign currency, with a consequent rise in the possibility of mismatch between these two flows, as an outcome of exchange rates fluctuations.

Wolfson (2002) also argues that Minsky's theory of financial fragility can be modified to the case of an open economy, where this fragility would be exacerbated by the possibility of capital flights, causing reserves shortages in some of these markets. Thus, changes in world interest rates and/or in exchange rates can turn former solid or at least reasonably financed activities into no longer viable ones, leading once more to financial instability (FRITZ et al., 2014).

In open economies, an important issue is not only the ability of agents to pay their debts, but also the perennial collective capacity to generate enough foreign exchange to pay these debts and/or to issue foreign currency. In the case of developing/peripheral economies, which lack almost by definition developed financial systems, there is a need, time and again, in many cases, to use up some resources of the international financial system, private or official. Thus, these economies may tend to accept risky finance for projects, in terms of interests and exchange rates, which can lead to foreign exchange shortages, since these countries do not issue internationally acceptable currencies (RESENDE, AMADO, 2007).

According to the mainstream theory of development, when a country has a low level of savings, those savings should be complemented with foreign investment. The argument is that one should adopt a policy of growth with "foreign savings" and with open capital account, because the capital-rich countries would transfer these surplus funds to developing countries and those resources would go to the productive sector. Countries with an abundance of capital would have a lower marginal productivity of capital in comparison with developing countries and the opening of the capital account would allow equalization of marginal productivities of capital around the world. Thus, developing countries would pay their debts without major problems and even increase their (and the world) welfare. Therefore, poor countries could live with appreciated real exchange rates and current account deficits (BRESSER, GALA, 2007), relying on capital transfers to fill the gap between these deficits and a sustainable Balance of Payments. However, there are several negative consequences of the opening of the capital account. We can stress two main problems related to this opening: first the high volatility of capital and, second, that developing countries, in general, could not get loans in their own currency (BRESSER, GALA, 2007). When developing countries follow this model of economic growth, the exchange rate becomes the most important factor because it indicates whether the country has accepted the use of "foreign savings" (i.e, current account deficits) to grow or even in a more profligate manner, that is to say, wasting reserves in trade without much growth, investment, etc.

We could define the equilibrium exchange rate as one that, over time, ensure zeroing the Balance of Payments. Such a rate would vary due to capital inflows and outflows and changes in current account transactions, also determined by changes in the competitiveness of production of goods and services in one country in comparison to the rest of the world (MORENO-BRID, 2003; BARBOSA FILHO, 2002; 2004). Depending on the elasticity of supply and demand for goods and services in relation to the exchange rate, a variation might cause a reduction in domestic savings, i.e, of domestic investment +

“public sector savings” and an increase in foreign savings, i.e, in current account deficit (BRESSER, GALA, 2007).

Another explanation, stressed by post-Keynesians, explain capital flows by the search for greater profitability in capital application, including, among them, productive investments (Keynes, 1936: Chapter 17). Capital, as we know, seek therefore the best opportunities for profitability, considering also, of course, risks, including those derived from concentration of investments in certain alternatives, which reduce the profitability of implicit applications, using a discount stipulated by the capitalist (Zendron, 2006). Obviously, this calculation considers also the possibility of appreciation/depreciation of the relevant assets, including the appreciation/depreciation of the exchange rates which could have an impact in the yields of the relevant productive or mere financial applications.

Kregel (1996) argues that conventional theory does not consider that in developing countries openness to foreign investment could lead to the denationalization of the local industry, with great pressure on the exchange rates and the domestic money market. Therefore, the internationalization of an economy and its opening for foreign firms will not necessarily be compatible with the required behavior or adjustments in the Balance of Payments, in a world with both floating exchange rates and interest rates, depending, rather, on a complex interaction between exports and imports of goods and services, and remitted incomes, earnings and capital sent and received from abroad:

“The idea has thus grown that FDI should be preferred to other forms of foreign borrowing as it does not have the foreign exchange denominated, periodically reset, interest characteristic of syndicated bank debt, nor does it exhibit the volatility associated with portfolio investment. This is basically because FDI is considered to be investment in domestic bricks and mortar that, once physically installed, cannot be easily repatriated. It thus represents a permanent contribution to a country’s resources” (Kregel, 1996:56).

Nonetheless, this is not necessarily correct, since many international investors can change their portfolio, buying or selling assets within other countries with great ease:

“Home country firms keep their balance sheets in their domestic currency, and foreign investments represent currency risks in the same way as any other use of company funds. This means they will be hedged in the same way. The fact that investments are in real productive assets does not mean that foreign currency risks and funding risks will be ignored. To the extent that risks are covered, they will produce cross-border flows that put pressure on the foreign exchange market or the domestic money market, which may reinforce other destabilizing elements” (Kregel, 1996:57).

In other words, international investors are nonetheless creating ways to protect themselves against the possible exchange or interest risks, by hedging their positions in different markets. Therefore, Kregel argues that FDI is one of the most expensive sources of investment, since the required return of it is generally higher than the interest rates of other types of finance (Kregel, 1996).

Note that FDI, in empirical terms, can consist of portfolio investments to a greater or lesser degree, its separation is difficult between productive (greenfield) or unproductive (brownfield or portfolio) investments. Moreover, even greenfield investments can be overstated, since part of it often is directed to other functions than new investments.

Another important issue regarding FDI is that a national affiliate is receiving this initial financial “investment”, needing to be encouraged to purchase capital goods and/or inputs. In this case, even if the profits are reinvested in the form of FDI, via capital account, those profits do not necessarily consist of an actual new inflow of foreign currency, but can have been obtained through occasional imports of capital goods and inputs which will represent actual outflows, causing impacts over foreign currency reserves and causing negative impacts on the sector producing these goods, if the bias to import them are larger

than with national firms. For Kregel (1996), when the FDI exceeds a certain amount in its relation to national income, investors can increase their expected returns, due to foreign reserves and exchange rate risks. In this case, Transnational Companies (TNCs) will no longer reinvest their profits and, moreover, can interrupt new FDI. Therefore, without these new capital inflows, to what one could add new remittances related to capital already invested, one can once again generate imbalances in the Balance of Payments. Even Dunning (1994) argues that FDI can cause internal changes to recipient countries, as it may cause a change in the consumption pattern of the population, increasing imports and generating economic growth restrictions.

This process of reversal of capital flows towards developed countries is consistent with Minsky's financial instability approach, since in times of reversal of expectations, lenders cease to lend toward developing countries, due to (even expectations of) instabilities in their domestic economies and/or in the international economy.

In Brazil, in the 90s, FDI contributed little to the growth of industry, since these investments were directed to the purchase of existing assets in Brazil, i.e., to brownfield investments. Thus, there was a low ratio between "foreign investments" (FDI) and the growth rate of the gross fixed capital formation. Briefly, Brazil was one of the countries that absorbed more FDI, but this had no major effect over economic growth. Furthermore, much of this FDI was directed to investments in the service and non-tradables sectors, providing virtually no gains in exports, despite the huge increase in pressure on the Balance of Payments, because of remittance of profits, interests, royalties, capitals, etc. This analysis can be extended to Latin America in general, since countries such as Mexico and Argentina received great amounts of FDI but these capital flows also did not bring about higher growth rates of investments and of their whole national economies.

Since 1994 the rate of gross fixed capital to GDP in Brazil, Mexico and Argentina has been around 20%. Thus, it is evident that with the end of the privatization process in the three largest Latin American economies, FDI flow would diminish, with the aggravating factor of payments of dividends, which increases deficits in the balance of services (LAPLANE, SARTI, 2002).

The denationalization of many Brazilian firms has also, as was expected by some economists, not contributed to Brazilian exports, for many of these firms were transformed into affiliates of foreign companies expanding their import coefficients, adding to the formerly described pressures to external imbalances. For Aurélio (1997), the uptake of "external resources" as a strategy for development should be temporary because even when this strategy initially functions, it may lower "domestic savings", i.e., reduce the liquid outcome of the current account ("foreign savings") which compensates the decrease in domestic savings (public and, mainly, private), with no impact on total savings because of its zero or negative impact on domestic investment.

Therefore, not necessarily foreign savings (the inverse of the current account outcome) and/or foreign capital inflows are influencing positively investment decisions, because these **ex-post** results may be the outcome of an increase in imports (AURÉLIO, 1997), reducing at the same time, as pointed out, private savings in the domestic economy. Moreover, external dependence in relation to foreign capital, in a world of strong instability of the international financial system and low resilience of peripheral economies against external shocks, defines a state of external vulnerability, responsible for restricting economic growth, which characterized the 90s, in Brazil (CARCANHOLO, 2002).

For Farhi and Prates (2006) the supremacy of globalized markets manifests itself differently in peripheral economies, with respect to its power to determine the interest and exchange rates. The higher the degree of financial liberalization, the more the peripheral economies are subject to sudden changes in expectations of foreign agents, leading to high volatilities in some of its key financial and economic variables (FRITZ et al., 2014).

According to the conventional approach, in a context of high capital mobility, the adoption of a floating exchange rate regime would expand the degrees of freedom of monetary policy. However, Farhi and Prates (2006) and Fritz et al. (2014), for instance, disagree with this view, arguing that the high mobility of capital and the adoption of a floating exchange rate regime emphasize the interrelationship between interest and exchange rates. As the peripheral economies are vulnerable to short term capital flows the exchange rates suffer direct influence of interest rates. The more the markets and the financial system of the country are open, the lower the ability of the monetary authority to influence the formation of interest rates and the determination of the exchange rate. In reality, then, contrary to conventional theory predicts that adjustments at the margin in interest rates must be sufficient to adjust the exchange rate to its right level, to bring about a zero net increase in international reserves, the reality shows that adjustments in the interest rate have to be much more pronounced, in order for this adjustment to occur, causing a strong adverse impact on aggregate supply and demand.

One way to assess whether these imbalances cause adverse impacts, i.e. whether they limit economic growth, is by investigating if economic growth is (or was) restricted by the Balance of Payments, following the seminal work of Thirlwall (1979). Based on the proposition that current account deficits cannot be financed indefinitely, Thirlwall argues that the shortage of foreign currency sets a limit to the rate of expansion of aggregate demand and, consequently, the rate of income growth. Grounded on the simplifying assumption that foreign capital flows and terms of trade are constant, authors which followed Thirlwall also arrived at the result that the long-term income growth rate of a country is highly connected to the exports growth rate, with due regard also to imports income elasticity – but more complex models also consider net inflows of capital (THIRLWALL, HUSSAIN, 1982; MORENO-BRID, 1998-99; 2003; BARBOSA FILHO, 2002; 2004; LIMA, CARVALHO, 2009). One will detail briefly these theoretical developments in the next section.

3. BALANCE OF PAYMENTS CONSTRAINED GROWTH AND FDI

The theory that discusses the issues of Balance of Payments constrained growth was first elaborated by Thirlwall (1979). Its main idea is that economic growth can be constrained by the external sector if the income elasticity of imports is higher than the income elasticity of exports. In the current article we followed several developments derived from that Thirlwall original model. The Balance of Payments constrained growth model, which defines the rate of growth consistent with the sustainability of each country Balance of Payments, is a direct relationship between the income elasticity of foreign demand for a country exports and the income elasticity for imports of this same country. Beginning from the following equation:

$$PdX_t = PfMtEt(1)$$

Where X and M are respectively the volume of exports and imports, Pd is the domestic price of exports in local currency, Pf is the foreign price of imports, and E is the nominal exchange rate, both external demand for exports and domestic demand for imports depend on the price and income elasticities as well as on the domestic income (Y) and foreign income (Z), so that:

$$M = a \left(\frac{P_f E}{P_d} \right)^\psi Y^\pi \quad (2)$$

$$X = b \left(\frac{P_d}{P_f E} \right)^\eta Z^\varepsilon \quad (3)$$

In equations (2) and (3), “a” and “b” are constants, ψ is the price elasticity of imports, π is the income elasticity of imports, η is the price elasticity of exports and ε is the foreign income elasticity of demand for exports. Equations (2) and (3) expressed in terms of growth rates are as follows:

$$x = \eta (pd - e - pf) + \varepsilon z \quad (4)$$

$$m = \psi (pf + e - pd) + \pi y \quad (5)$$

Substituting (4) and (5) into (1) and solving for Y gives the solution for the economic growth rate consistent with balance-of-payments growth Y_{BP} :

$$Y_{BP} = \frac{(1 + \eta + \psi)(pd - pf - e) + \varepsilon z}{\pi} \quad (6)$$

Thus, an increase on internal prices reduces the economic growth compatible with a sustainable BP. On the other hand, a rise in external prices brings about also a rise in the economic growth compatible with the BP “equilibrium”. This is important because development countries can use devaluations of the exchange rate to increase their net exports. Besides, if there is a increase in the external income or a reduction in the domestic income elasticity of imports, the compatible Y_{BP} will rise. Furthermore, if the real exchange rate is constant ($e = 0$) and the external and internal prices are equal ($pd - pf = 0$), we can simplify equation (6). This expression represents the Thirlwall’s law:

$$Y_{BP} = \frac{x}{\pi} \quad (7)$$

In the long run the domestic income growth is determined by the relationship between the exports growth rate and the income elasticity for imports (MORENO-BRID, PÉREZ, 2003). The assumption that the change of the terms of trade are close to zero is subject to criticism, mainly by some supporters of neoclassical theory, since with this assumption the adjustment in the economies is done via BP (incomes) and not via pricing, an extremely important factor for neoclassical economists. Thirlwall (1979) argues that empirical tests do not support adjustments via prices. However, Alencar and Strachman (2014), following Lima and Carvalho (2009) modification that alter some relations of the Moreno-Brid (2003) model, as explained before a refinement of Thirlwall’s model, propose equation 10:

$$P_d X + P_d F + P_d R = P_f M E \quad (10)$$

Rewriting this equation (10) in terms of growth rates yields:

$$pdx + pdf + pdr = pfme \quad (11)$$

Lima and Carvalho (2009) define f as the real value of capital flows and r as the real value of capital services, both measured in foreign currency. Using the functions of demand for imports and exports – and solving the system of equations (6), (7), (12), (13) and (14) for y – we obtain the economic growth rate compatible with the Balance of Payments, capital flows, interest payments and the external sector without imposing any restriction on capital inflows, unlike the model of Moreno-Brid (2003):

$$x = \eta (pd - e - pf) + \varepsilon z \quad (6)$$

$$m = \psi (pf + e - pd) + \pi y \quad (7)$$

$$e + pf + m = \theta_1 (pd + x) - \theta_2 (pd + r) + (1 - \theta_1 + \theta_2)(pd + f) \quad (12)$$

$$\theta_1 = \frac{P_d X}{P_f M E} \quad (13)$$

$$\theta_2 = \frac{P_d R}{P_f M E} \quad (14)$$

$$y_{BP} = \frac{\theta_1 x + (1 + \psi)(pd - pf - e) - \theta_2 r + (1 - \theta_1 + \theta_2)f}{\pi} \quad (15)$$

where θ_1 represents the proportion of exports over imports, calculated in the initial period, θ_2 are foreign capital imports also calculated in the initial period, both indices calculated in real terms. The model specifications of Carvalho de Lima (2009) captures, thus, the capital account, payments for capital services, and also includes the terms of trade. Chiefly, it does not put any restriction on foreign funding and foreign debt, an important fact to be considered, given more or less recent Balance of Payments performances in Latin America.

In this work, in order to capture the effect of FDI on long-term Balance of Payments constraints, we modify equation (10): instead of using capital flows real values, we use the actual value of FDI flows (F-FDI) and instead of using the actual value of the services of capital, we use the real value of incomes derived from FDI (R-FDI).

$$P_d X + P_d (F - FDI) + P_d (R - FDI) = P_f ME \quad (16)$$

Rephrasing equation (16) in terms of growth rate yields:

$$pdx + pd(ffdi) + pd(rfdi) = p_f me \quad (17)$$

Thus,

$$e + pf + m = \theta_1(pd + x) - \theta_2(pd + (rfdi)) + (1 - \theta_1 + \theta_2)(pd + (ffdi)) \quad (18)$$

Solving the system of equations (6), (7), (18), (13) and (14) for y , yields:

$$y_{BP} = \frac{\theta_1 x + (1 + \psi)(pd - pf - e) - \theta_2(rfdi) + (1 - \theta_1 + \theta_2)(ffdi)}{\pi} \quad (19)$$

Through this modified version, Carvalho and Lima (2009) capture the impact of FDI on the constraint on long-term economic growth represented by the Balance of Payments, i.e, they try to know whether Foreign Direct Investments can hinder or facilitate long-term economic growth.

4. METODOLOGY AND DATA ANALYSIS

4.1 PANEL DATA ANALYSIS

In this paper we will use the panel data analysis econometric methodology . This methodology is a combination of time series and cross-section data. There are different approaches for the estimation of panel data in regression models: the fixed effects approach and the random effects approach. The basic equation is:

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \dots + \beta_n X_{nit} + u_{it} \quad (20)$$

$$\begin{aligned} i &= 1, 2, \dots, n \\ t &= 1, 2, \dots, n \end{aligned}$$

where i stands for the i th cross-sectional unit and t for the t th time period.

The estimated fixed effects approach depends on the assumption about the fixed terms. We assume that the intercept and slope coefficients are constant across time and space and the error term captures differences over time and individuals variables or that the slope coefficients are constant but the intercept varies over individual data and time.

4.2 – DATA METHODOLOGY

In this research we will work with data of Latin America. In our approach we seek to get to know whether the economic growth in Latin America suffered restrictions caused by the Balance of Payments, taking into account the law of Thirlwall modified to capture restrictions/allowances due to FDI.

For the present work, we need data to calculate price elasticities and income elasticities of imports, in addition to data for the calculation of equation (19), more precisely, imports and exports of goods and services, both in local currency and in current real exchange rate; foreign direct investment in current dollars; incomes from foreign direct investment in current dollars, and consumer prices for the U.S. Data were collected mostly in the World Development Indicators (WDI) of the World Bank, the Economic Commission for Latin America and the Caribbean (ECLAC) and the World Economic Outlook Databases (WEO) of the International Monetary Fund. The first step was to estimate the following equation for panel data:

$$\ln(m) = a + \pi \ln(y) + \psi \ln\left(Pf \frac{E}{Pd}\right) \quad (21)$$

where:

a = intercept

$\pi \ln(y)$ = level of income elasticity

$\psi \ln\left(Pf \frac{E}{Pd}\right)$ = level of real exchange rate

In the WDI we found 41 countries, however we were not able to find all the data necessary for this research in all of them. Thus, the countries used in the research were restricted to the following twenty:

Table 1: Countries included in this research.

Argentina	Chile	Ecuador	Honduras	Paraguay
Belize	Colombia	El Salvador	Mexico	Peru
Bolivia	Costa Rica	Guatemala	Nicaragua	Uruguay
Brazil	Dominican Republic	Haiti	Panama	Venezuela

For the countries above we collected data for the selected variables from 1990 to 2011. From the WDI data base we excluded the following countries because we were unable to find the necessary data:

Table 2: Countries excluded from this research.

Antigua and Barbuda	Curacao	Puerto Rico	St. Vincent and the Grenadines
Aruba	Dominica	Saint Maarten (Dutch part)	Suriname
Bahamas, The	Grenada	St. Kitts and Nevis	Trinidad and Tobago
Barbados	Guyana	St. Lucia	Turks and Caicos Islands
Cayman Islands	Jamaica	St. Martin (French part)	Virgin Islands (U.S.)
Cuba			

After calculating the income elasticity of imports, and their test, we calculated the income of the period using equation (19). We achieved of data performed through the test by Alonso (1999) which

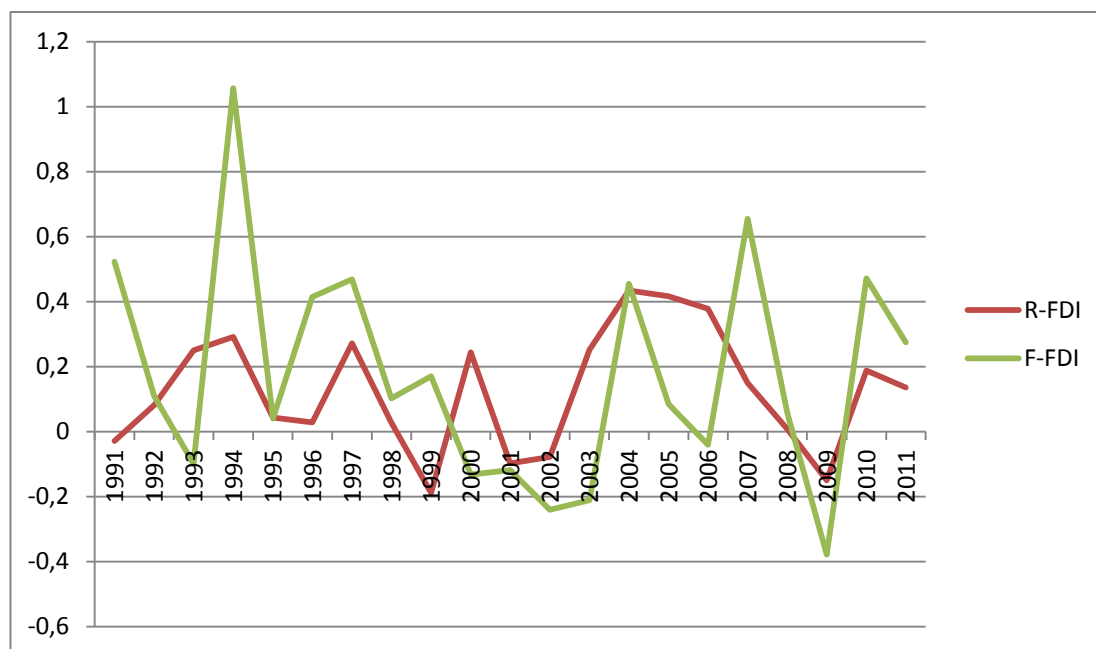
consists of regressing effective income in terms of growth rates and compare it with the estimated income by the model. This estimated income by the model is attained as follows: for each period income is calculated by equation (19), using the average growth rates by the estimated values through the function of price and income elasticity of imports; and the other variables are estimated in terms of average growth rates, through the methodology of vector error correction (VEC). This implies that these growth rates can save a long-term relationship.⁴

4.3 – DISCUSSION OF THE RESULTS

4.3.1 Graphic analysis

In this section we analyze graphically the capital flows in percentage rates. We started the analysis with aggregated flows to Latin America. The variable R-FDI is the payments on FDI and the variable F-FDI is the inflow of FDI to Latin America in the period 1991-2011. We analyze aggregate data in the three largest economies in Latin America through this method: Brazil, Mexico and Argentina (according to data from ECLAC, 2013, they represent circa of 75% of the GDP in the region).

Chart 1: Capital flows to Latin America, in percentage growth rates

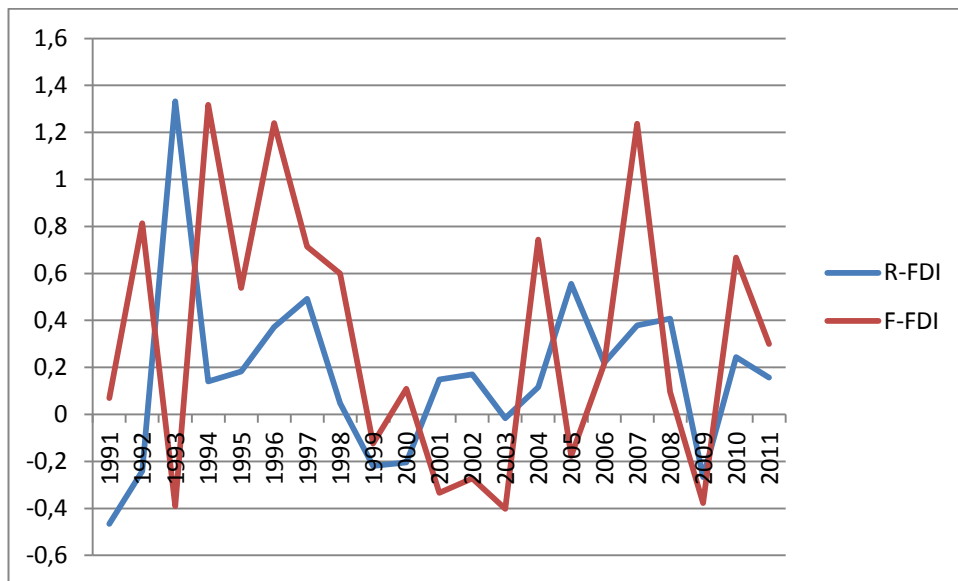


Source: World Bank

The average rate of growth of return on foreign direct investment for the period was 12%, while the average growth rate for FDI flow was 17%. To the whole Latin America and in most of the period 1990-2011, there was an increasing rate of FDI inflow. Between 2000 and 2003 the growth rate of return of FDI was higher than the growth rate of FDI towards Latin America, the same occurred between the middle of 2008-2010. In the first period in which it occurs it may be a consequence of the crises in Brazil (1999) and Argentina (2001). In the second period the reversal can be related to the 2008 crisis.

⁴ Britto and McCombie (2009) use a similar methodology.

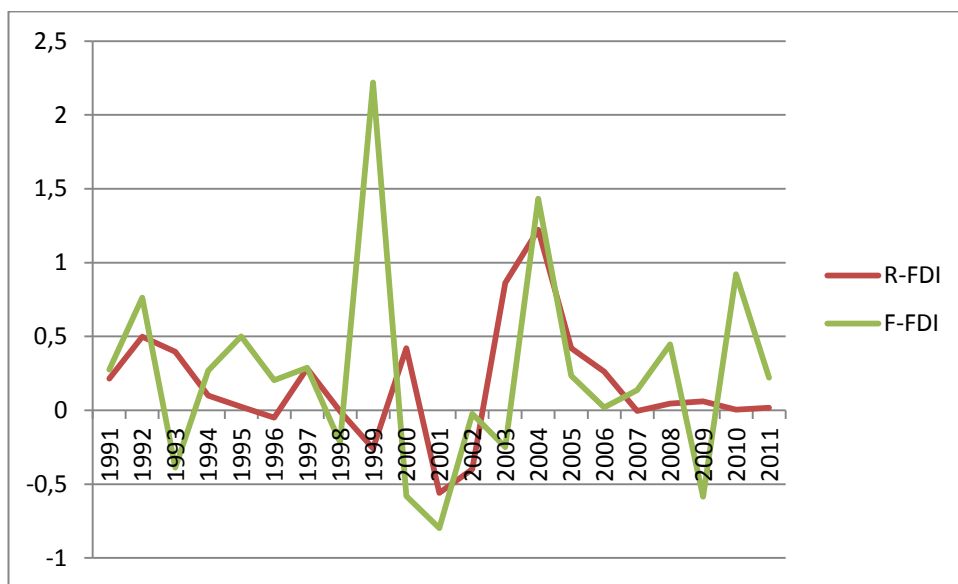
Chart 2: Capital flows to Brazil, in percentage growth rates



Source: Word Bank

The average growth rate of return on FDI in Brazil was 16%, with an average growth rate of FDI into the country of 31% per annum in the period. We have identified a similar movement with the aggregate data, in which the percentage growth in the return on FDI exceeded the average growth of FDI flows.

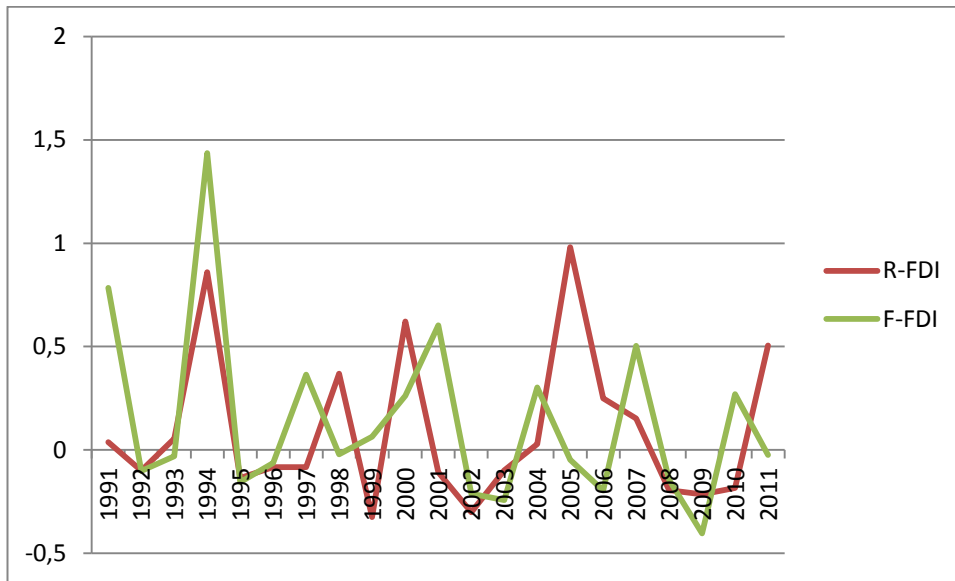
Chart 3: Capital flows to Argentina, in percentage growth rates



Source: Word Bank

In Argentina we found similar results: the average growth rate of return on FDI was 16%, while the growth rate of FDI flows towards Argentina was about 24%. Important to note that the second peak growth of FDI to Argentina was the sale of the Argentine state oil company.

Chart 4: Capital flows to Mexico, in percentage growth rates

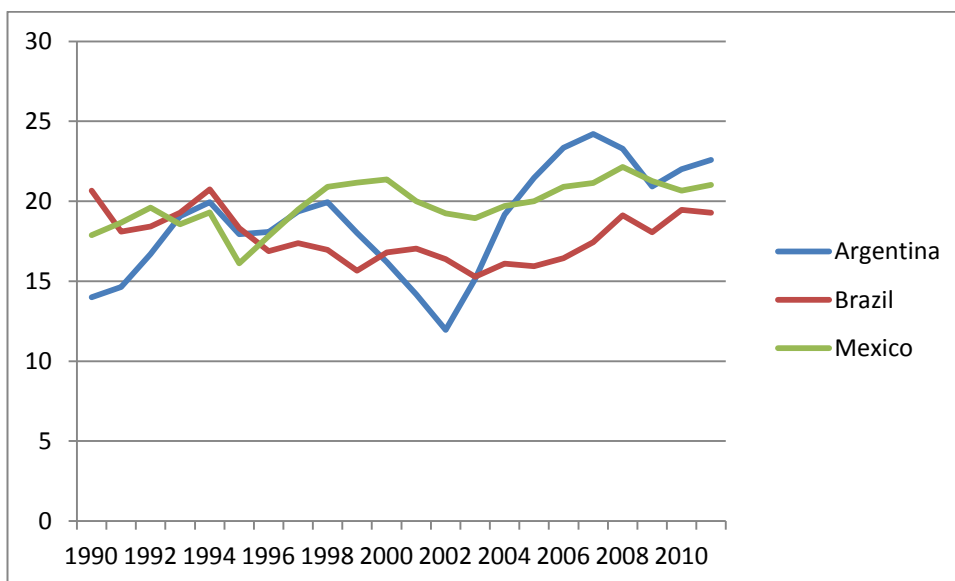


Source: World Bank

In Mexico, after 1995, the growth rate of FDI inflows was rather close to the growth rate of return on FDI, for the entire period: the average return on FDI was 16%, while the average growth rate of FDI into the country was 24%.

Although the average growth rate of FDI flow towards the underscored countries have been higher than the rate of growth of returns on FDI in the period analyzed, we can see in the Chart 5 that the gross fixed capital formation to GDP ratio was kept close to or below 20% almost throughout the whole period, in the three major countries of Latin America. This can be a strong indication that the FDI inflow for these countries may have been directed to acquisitions of companies that already existed, in many cases, formerly major state companies. Moreover, many of these companies do not produce *tradables*, which brings about that these FDI flows can be a new source of growth restriction through the Balance of Payments.

Chart 5: Gross fixed capital formation (in % of GDP)



Source: World Bank

4.3.2 Econometric analysis

To estimate the income elasticity of imports using the methodology of panel data is necessary to use the Breusch and Pagan test. This test seeks to identify whether there are unobserved effects that may be biasing the estimators. The test result was Probability > chi-square = 0.0000, showing that there are effects biasing the estimators, since Prob > chi2 is significant (near zero).

We needed also to perform the Hausman test that indicates whether the fixed effect is more efficient than the random effect. The result of this test was Prob > chi2 = 0.0000. In this case, we do not reject the H0 that there is no difference between the coefficients, since Prob > chi2 is close to zero. This indicates that the effect of random choice is more efficient than the fixed effect.

Table 3: Income elasticity of imports

Variables	Random effects	Variables	Fixed effect
	Coefficients		Coefficients
Constant	8.775594***	Constant	23.34837***
	1,229058		1.745.805
Lny	0.5826067***	Lny	0.0182336***
	0,0469149		0.0675542
Lner	0.0861772***	Lner	0.0976522***
	0,0238339		0.0211802
Dummy for years	Yes		
Hausman test	Prob > chi2 = 0.0000		

Note:*, **, and *** indicate significance at 1 percent, 5 percent, and 10 percent, respectively.

For the estimation of the panel data, we concluded that besides the fact that the significant coefficients are 1%, the signals follow what was expected, since both are positive.

Table 4: Alonso's test

VEC			
Included observations: 18 after adjustments/ Standard errors in () & t-statistics in []			
Restriction : LM=1, e LR = 1			
chi-square	0.000476		
Prob.	0.982600		
Long-term equation	C	Y(-1)	Y*(-1)
	-0.001709	1	1
	(0.00472)		
	[-0.36241]		

The result of the test proposed by Alonso, since the chi-square is significant at 5%, do not reject the null hypothesis that both estimated and real incomes are different, therefore concluding that the economic growth was effectively compatible with the balance payments. The result confirms the hypothesis of Kregel (1996), Laplane and Sarti (2002) and even Dunning (1994) that FDI can be a source of restriction to economic growth, mainly if the capital inflow into the host country is not constant and/or in the case that FDI is not directed to the production of *tradables*.

5. CONCLUDING REMARKS

This research tried to answer the following puzzle: was the recent Latin America economic growth constrained by the Balance of Payments? To solve this puzzle we identified whether there was a relationship between foreign direct investment (FDI) and long-term growth in the period between 1990 and 2011 in Latin America. And the answer for the question was positive. We found elements which confirmed the hypothesis that Kregel (1996) and Laplane and Sarti (2002) stressed, i.e., that FDI inflows could be limiting the economic growth, from its impact on the Balance of Payments.

In the second and theoretical section, we showed the relationship between capital flows and a possible constraint on growth. We started the analysis keeping in mind the financial instability hypothesis of Minsky (1977), which assumes that if the world economy is in times of expansion, the international liquidity also expands (and thereby also the capital flows toward the peripheral countries). However, when these countries engage in speculative finance, they become vulnerable because a change in expectations can also change abruptly the size and direction of capital flows, even making seizures eventually possible.

Applied to the open economic environment of the 90s, when there was an expansion of the international liquidity and the reintegration of Latin America into the International Financial System, especially afterwards the Plan Brady, several countries in the region have resorted to external financing. However, from the Mexican crisis of 1995 on, capital flows consisted mainly of FDI.

In the third section, we adapted the approach presented in Alencar and Strachman (2014), which incorporated FDI as a limiting factor of economic growth. Then, we explained briefly the methodology used for data processing. In the fifth section, we analyzed empirically the data.

The purpose of the paper, as explained before, was to analyze whether the economic growth in Latin America has been hampered by external constraints, especially through the Balance of Payments. However, this approach does not satisfactorily explain the experience of developing countries, so that other economists, some working with Thirlwall himself, have enriched it in order to include other components of the Balance of Payments, such as capital flows (Thirlwall & Hussain, 1982), external debt constraints (Moreno-Brid, 1989), external debt constraints plus interest payments (Moreno-Brid, 2003), as well as an approach without external debt constraints (Lima & Carvalho, 2009); we added to the model presented in Alencar and Strachman (2014) a new specification that includes the analysis to FDI, finding important results in this more complete model.

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