

The effects of portfolio investments flows in firms' capital structure: a study of Brazilian firms from retail and textile sectors.

RESUMO: Estudos anteriores sugeriram que o fluxo de investimento de portfólio reduz o custo do capital próprio (equity) das empresas, ao reduzir o retorno esperado das ações e dividir o risco associado ao ativo financeiro entre investidores domésticos e estrangeiros. O objetivo do estudo foi o de verificar se com o fluxo de investimentos de portfólio, as empresas da amostra ajustaram seus níveis de endividamento, refletindo uma redução marginal no custo do capital próprio em relação aos capitais externos. O método empregado foi o de regressões com dados em painel, utilizando o estimador de primeira diferença. Os resultados sugerem que as empresas da amostra de fato ajustaram sua estrutura de capitais em função do afluxo de investimentos de portfólio, pois o efeito marginal dos investimentos de portfólio no grau de endividamento é negativo. Empresas maiores e com maiores oportunidades de crescimento apresentaram uma maior redução marginal no endividamento.

Palavras-chave: Estrutura de Capital; Fluxos de Investimento de Portfólio; Fluxos de Capitais.

ABSTRACT: Prior research suggested that the flow of portfolio investments reduces the equity cost of firms, by a reduction in the expected return of stocks that follows from the sharing of risk associated to the financial asset between domestic and international investors. The objective of the study was to verify whether the flow of portfolio investments causes firms to adjust their levels of leverage, reflecting a marginal reduction of own capital cost relative to external capitals. The method employed was panel data regressions, using the first-differenced estimator. Results suggest that firms in the sample in fact adjusted their capital structure following portfolio investment flows, as the marginal effect of portfolio flows in the debt-to-assets ratio is negative. Larger firms and firms with higher growth opportunities presented a higher marginal reduction on leverage.

Keywords: Capital Structure; Portfolio Investment Flows; Capital Flows.

JEL Codes: F320; G320.

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1. Introduction

Within the context of growth in the globalization of financial markets, the flow of international capitals to emerging economies has boomed in the recent years. The reforms carried out by emerging economies governments from 1980-1990 onwards paved the way for the liberalization of financial markets in these countries, contributing to the growth of international capital inflows (Singh and Weisse, 1998).

Considering the growth rates that the Brazilian economy reported in the last years, much of these capitals were attracted to the Brazilian financial market. Meurer (2006) argues that the performance of the Brazilian stock market (BOVESPA) has influence in the behavior of foreign investors. The growth of the Brazilian equity market in the past years hence attracted international portfolio capitals, motivated by the growth of profits of Brazilian firms and liberalization efforts pertaining to the Brazilian laws on capitals (Veríssimo and Holland, 2004).

There is vast literature on the effects of international capital flows in the emerging market economies, most of this literature paying attention to macroeconomic factors. In short, foreign capital can finance investments and stimulate economic growth, increasing the standard of living in emerging economies countries (Calvo, Leiderman and Renhart, 1996). International capitals can inflow to a country by a number of ways, from Foreign Direct Investment (FDI), loans to government from international institutions and governments, inter-company loans, portfolio investments, etc. In this study we focus on international portfolio flows to stocks, as they are directed to the financial markets, specifically to the equity market.

One particularly interesting positive effect of international portfolio flows pertains to the equity cost reduction experienced by firms that follows large waves of capital inflows. International portfolio flows have the ability to promote local capital market development, which in turn, imposes the microeconomic effect of stock market expansion and hence reduction in the cost of capital for firms (Singh and Weisse, 1998). In this study we focus on this aspect.

Following the stock market liberation, the inflow of international capitals tends to generate a risk sharing between domestic and international agents. This risk sharing, in turn, would lower the equity price premium that must be earned over investments in a country's financial assets. Hence, international capital inflows resulting from stock market liberation reduce the aggregate cost of equity for the domestic firms in the given country (Henry, 2000). In the same line, Meurer (2006) argues that, if the market liberation leads to an appreciation of stock prices, it may cause a reduction in the cost of capital of firms by reducing the expected returns on these stocks.

There are many theories that attempt to explain the capital structure decision of firms, being the most prominent ones discussed later. However, it is reasonable to assume that the capital structure choice of firms is done in ways to minimize the cost of capital, if we agree that firms maximize profits.¹ Thus, in an environment marked by a high flow of international capitals, firms receiving these capitals would benefit from a reduction in their equity cost, as the buying pressure on their stocks would drive expected returns downwards. If equity cost becomes marginally (relatively) cheaper than the cost of debt, firms should adapt their capital structures by trading debt financing by equity financing proportionally to this marginal cost reduction.²

Following this reasoning, the main objective of this study is to evaluate the impact of international portfolio flows on the capital structure choice of Brazilian firms. However, not only the impact on the capital structure is interesting, but also how firms' characteristics may mediate this impact. Between many possible firms' attributes that are interesting, this study focuses on growth and size. More specifically, firms growing

¹ Under agency-theory approach this assumption is often relaxed.

² It is not being argued that equity becomes cheaper than debt in absolute value, as it would strongly contradict Pecking Order Theory.

at higher rates could attract more foreign capitals, and hence profit more from a higher equity cost reduction. Also, prior studies showed that large firms experience stronger revaluation effects after large capital inflows, capturing a big share of these capitals (Christoffersen, Chung and Errunza, 2006). Hence the secondary objective of the study is to check whether foreign capitals make high growing firms and larger firms employ stronger capital structure adjustments than firms growing relatively slower or holding a smaller assets base.

To answer to the questions posed by the objectives, the choice was to study the behavior of firms from two sub-sectors belonging to the Cyclical Consumption Sector, as per the BOVESPA classification criteria, which are Retail (*Comércio*) and Textiles (*Têxteis, Vestuário e Calçados*), departing from the intuition that firms from cyclical consumption sectors should benefit from the consumption based growth cycle faced by the Brazilian economy, increasing profits and becoming attractive to international portfolio investors³.

This study is relevant in two aspects. First, it contributes to theory both on corporate capital structure and international capital flows, two fields of research that are separate, but can intertwine yielding interesting economic and financial implications. Second, the study brings a somewhat neglected approach to the topic, which is firm-level analysis. Interesting prior papers evaluated the causes and impacts of international portfolio capital flows into the Brazilian stock market and economy in general (Franzen, Gonçalves, Meurer and Seabra, 2009, Meurer, 2006, Veríssimo and Holland, 2004). These studies shed light on important matters, and draw relevant conclusions, but when it comes to the impact of these portfolio flows on firms' capital structure, results come only from market level analysis (reduction of market equity cost).

Building on Christoffersen, Chung and Errunza (2006), market aggregate results are useful to assess the effects of portfolio flows (market liberation) on a country's securities, but from a broad policy standpoint, it is also important to evaluate how these effects may have impact at microeconomic or firm level. Also, using firms' data we can work with higher samples by using the panel structure, yielding statistical robustness to estimations.

The impact of portfolio flows into the capital structure of firms was analyzed by panel data regressions, using the first difference estimator. The dependent variable of the regression is Debt to Assets ratio, and the independent variables are Net Portfolio Flows to Stocks (PF_s) as a proportion of total market capitalization of BOVESPA, and controlling variables for size, growth, liquidity and cash holdings (natural log of total assets to size, natural log of market value of equity to liquidity, natural log of market to book ratio to control for growth and cash-to-assets ratio for cash holdings).

Further, to evaluate if capital structure adjustments vary between the two sectors and as function of the growth and size of firms, we employed the same regressions but dividing between groups (groups specified depending on the objective of each analysis, ie, high-low growth, small-large assets base, retail-textile, etc). More details about the methodology (sampling, variables and modeling procedures) are presented in the Methods section.

The paper is organized as follows: the following section brings a short literature review on international portfolio investment flows and capital structure. Next the methodology is detailed, sample is described and the modeling procedures are presented. The last two sections analyze results and conclusions, limitations and further research recommendations.

³ In the section of Methods, item Sampling and Data, the motivation to choose these sectors is better developed and empirical evidence that the intuition that motivated sample was reasonable is presented.

2. Literature review

2.1 International capital flows

We briefly discuss prior literature on international capital flows, focusing on portfolio flows. First the causes of these flows are reviewed, and next the consequences and impacts of portfolio flows are assessed. The macroeconomic impacts are shortly encompassed, but the focus is in the impacts into firms' level.

2.1.1 Causes of international capital flows

Calvo, Leiderman and Renhart (1996) argue that the factors that encourage international flows of capital can be categorized into external facts to the economy receiving the flow and the factors that are internal to this economy. The external facts are also called "push" factors, whereas internal factors are named "pull" factors (Singh and Weisse, 1998).

The push factors are related to the state of the economy in the developed world, as the capital flow from developed countries to emerging markets from 1980 onwards basically. One first reason for these capitals to seek investments in least developed nations was the sustained decline in world interest rates that took place in the period. Lower interest rates in the developed nations attracted investors to high-yield investments in Latin-American and Asian countries, basically. (Calvo, Leiderman and Renhart, 1996).

One second important fact was the economic recessions in USA, Japan and Europe that occurred in the early 1990s. Since return to capital is lower in times of economic downturn, the higher profit opportunities in the developing countries made these markets more attractive to foreign capitals. The third strong reason for capital inflows to developing countries was the desire of institutional investors of diversify their portfolios, balancing their risk exposure (Singh and Weisse, 1998).

The pull factors are related to internal adjustments that emerging economies' governments did in order to improve their financial systems. These factors are centered around economic, legal, regulatory and political environment in developing countries. As Singh and Weisse (1998) argue, countries carried out reforms to improve protection of international investors, reduce transaction costs and enable foreign investors to quickly move funds in and out of emerging stock markets.

The efforts put by governments in order to promote the liberalization of financial markets, contemporary to the high growth rates and the macroeconomic stabilization that many emerging economies were experiencing played a very important role in attracting large sums of international capitals to developing countries (Franzen et al, 2009). The push and pull factors combined caused these high flow of capitals from developed to emerging countries.

2.1.2 Consequences of international capital flows

The first important impact of international capital flows that materializes after financial liberation is that the integration of the domestic market with the global market rises over time (Christoffersen, Chung and Errunza, 2006). Other Important macroeconomic effects that arise from international capital inflows are summarized in higher accumulation of foreign currency reserves, widening of current account deficits, as the national investment rises and national savings decline (the difference between these two elements is exactly the current account deficit).

Countries receiving high capital inflows also experience rises in national private consumption spending, as a consequence of lower savings, a rapid growth in the money supply in both nominal and real terms that follows from the acceleration of economic activity, depreciation of domestic currency and finally international capital flows tend to increase stocks and real estate prices in the target country (Calvo, Leiderman and Renhart, 1996). In short, net foreign resource inflows allow countries to reach higher rates of capital accumulation and hence achieve higher growth rates (Bosworth and Collins, 1999).

On the microeconomic side, empirical evidence is not as abundant as it is for macroeconomic effects. Most of studies focused on market level variables and data, and hence made general conclusions. There are more numerous studies that focused on the impact of capital flows that followed a liberalization of financial markets in emerging countries, and some of these studies used firm level analysis. In these studies, the variable of interest to capture the liberalization process is the date or set of dates when significant reforms took place, and the main method is to check how stock markets reacted after announcements of liberalization reforms. (Henry, 2000, Christoffersen, Chung and Errunza, 2006, Bekaert and Harvey, 2000).

Past studies suggest that international capital flows tend to decrease the cost of capital for firms. Errunza and Losq (1985, 1989), in their models of international asset pricing under market segmentation, showed that after capital markets integrate, following liberalization processes mainly done by emerging markets, the cost of capital of firms previously restricted to their domestic equity market should decline, following an international diversification of the risk associated to firms' stocks. Under a mild segmentation hypothesis, firms considered eligible for investment don't have their returns affected, but firms previously considered ineligible command a super-risk premium on their stocks. Christoffersen, Chung and Errunza (2006) argue that on liberalization, the increase in the stock prices from capital flows may be temporary (price pressure) or permanent (lowering the cost of capital). However, as suggested by Bekaert, Harvey and Lumsdaine (2002), higher stock returns after capital inflows cannot be merely price pressure because effects are somewhat permanent.

The mechanism that drives the equity market reduction has two main forces behind. The first, and maybe most relevant, is the reduction in the relative risk of a market's equity assets after liberalization and integration into the global equity market (Henry, 2003). The second reason has to do with the supply and demand of financial resources, as before portfolio inflows to a given country, the sources of capital that a firm can rely to invest in their stocks is more restricted. After liberalization, there are more investors willing to lend capital through equity purchases, so there is an increase in the aggregate amount of funds available, creating competition among suppliers of funds, which in turn, reduces transaction costs, thus lowering the cost of capital (Stulz, 1999). Here we focus and explain in details the first mechanism, as the second one is based on a more straightforward economic framework (higher supply of funds lowering cost of capital).

Following the model by Henry (2003), there are two components to a country's cost of capital, which are the risk free rate and the equity premium. As argued by the author, following large inflows of portfolio capitals, both elements should fall. The main assumptions of the model are that the equity market of a given small country is completely segmented from the world's equity market and that investors of world market have a constant relative risk aversion and that they only care about expected returns and variance of their portfolios.

Let $E[\bar{R}_s]$ denote the equilibrium rate of return on aggregate domestic stock market before liberalization, and r_f denote the risk free rate of return in the domestic market. The price of risk can be assessed by dividing the aggregate risk premium, $E[\bar{R}_s] - r_f$, by the variance of aggregate return on market, $Var(R_m)$. Author also assumes that the price of risk in the small country before liberation is a constant T , such that:

$$E[\bar{R}_m] = r_f + T \text{Var}(\bar{R}_m). \quad (1)$$

Next, the process of liberalization occurs, and foreign investors are able to trade in the domestic market and also domestic investors can trade abroad, and author assumes dividends in the domestic market have constant mean and variance. Let $E[\bar{R}_m]$ denote the new required rate of return in the domestic market, and $E[\bar{R}_w]$ denote the world's equity market required rate of return. Because the domestic market becomes fully integrated to the world's market, the new relevant risk free rate is the global one, r_f^* .

Hence the risk premium on the domestic market now becomes a function of the beta coefficient between the domestic market and the world market, $\beta_{m,w}$, and the world risk premium, $E[\bar{R}_w] - r_f^*$. Following liberalization, we have that:

$$E[\bar{R}_m] = r_f^* + \beta_{m,w} (E[\bar{R}_w] - r_f^*) \quad (2)$$

Assuming that the country that has just liberalized its equity market is small when compared to the world's market portfolio, it should have little or negligible effects on world's returns variance and risk premium, which implies: $(E[\bar{R}_w] - r_f^*) = T \text{Var}(\bar{R}_w)$. Using the definition of beta as the covariance between domestic and world portfolio returns divided by the variance of world's returns:

$$\beta_{m,w} = \frac{\text{Cov}(\bar{R}_m, \bar{R}_w)}{\text{Var}(\bar{R}_w)}$$

Simplifying equation 2 with the assumption of negligible effects of domestic country liberalization on the variance and hence risk premium of world's portfolio and also using the definition of beta between domestic market and world portfolio yields:

$$E[\bar{R}_m] = r_f^* + T [\text{Cov}(\bar{R}_m, \bar{R}_w)] \quad (3)$$

By subtracting equation 1 from equation 3, we have the change in the required returns on domestic equity market after liberalization:

$$\Delta E[\bar{R}_m] = (r_f^* - r_f) + T [\text{Cov}(\bar{R}_m, \bar{R}_w) - \text{Var}(\bar{R}_m)] \quad (4)$$

For the first term of the right-hand side of equation, the author argues that because poor countries (in case the economy liberalizing its equity market) have lower capital-to-labor ratios, the risk free rate of the country should be higher than the world's risk free rate, what implies the first term of right-hand side of equation to be negative.

With respect to the change in the equity premium, the argument is that the covariance between the domestic equity market returns and the world's equity market returns is smaller than the variance of the domestic equity market returns, implying second term is also negative. This idea comes from Stulz (1999), in the sense that the correlation between domestic and world's returns should not be too large, as if it was, it would imply they should share more or less the same risk and hence there would be no risk reduction by diversifying portfolios in the equity markets of different countries. In this line, the variance of returns in the domestic market should exceed the covariance between domestic and world's returns.

Thus, the change in the required return on the domestic country's equity market is negative, implying lower expected returns. Hence, the conclusion of Henry (2003) is that liberalization of equity market, and the associated large inflows of portfolio capitals, reduce the cost of equity.

Errunza and Miller (2000) argue that International Asset Pricing Models (IAPMs) suggest a lowering in the cost of capital of firms from countries who have a segmented equity market when these firms can access international capital markets. The decline in the cost of capital follows from the lowering of expected returns due to the diversification

potential that these firms offer to international portfolio investors. Thus, firms' stocks should exhibit positive returns, reflecting the increases in stocks' prices as the cost of capital falls, also known as the revaluation effect. The authors' study used firm level data, approaching the topic by analyzing the impact of ADR (American Depositary Receipts) issues of firms from both developed and emerging countries, which is another way of assessing the diversification potential that international firms offer to investors. Authors found that the cost of capital of firms issuing ADRs in the US stock market is associated to a reduction in 42% in the cost of equity capital, confirming predictions of IAPM models.

Foerster and Karolyi (2000) also tested the key prediction of the market segmentation hypothesis, which claims that Global Equity Offerings (GEOs) firms should benefit from access to globally-integrated markets, and those that take advantage of this access from segmented emerging markets in which the investment barriers are greater than expected should realize a greater benefit in terms of lowering their equity capital cost. Authors also studied ADR offerings, adding to the study the possibility of another type of depositary receipt offering which is the private placement orders under the Rule 144A (only available to specific investors), which differs from normal public ADR offerings in the sense that private placement equity offers are less subject to complying to US regulations, and hence is a simplified way for foreign firms to access the US equity market. Authors focus on the long run performance of listings, and for private placements depositary receipt offerings they found negative long run performance. Public depositary receipt offerings showed positive long run returns, and specially, firms coming from emerging markets with low accounting standards outperformed their domestic market benchmarks. This findings suggest that investors rewarded the firms that made efforts to comply with the more rigorous US accounting standards.

Christoffersen, Chung and Errunza (2006) also used firm level data in their study. The main purpose was to estimate the revaluation effect that stocks would go through after the liberalization process and the following inflow of capitals into the stock market. Authors checked whether the returns yielded by these stocks were higher when compared to a global returns benchmark, and also if the returns were comparatively higher for larger firms (size effect, as larger firms in emerging markets are usually preferred by international investors). The authors found that there is a positive revaluation effect, being the returns on stocks higher than the global benchmark during the liberalization of capital flows. Also, their results support the hypothesis that large firms experience higher revaluation effects than small firms.

Patro and Wald (2005) analyzed the impact of stock market liberation in 18 emerging markets, also using firm-level data. In line with prior studies cited, authors found that after liberalization process, the inflow of portfolio capitals caused expected returns to fall, implying a lower cost of equity capital, according to IAPM models' predictions of risk sharing between domestic and international investors. They also reported that dividend yields dropped substantially after liberalization, and that firms involved in the process, that means, firms that received a good volume of foreign portfolio flows, had their exposure to the international equity market augmented and a reduced exposure to domestic equity market shocks. Authors also evaluated whether firms' specific characteristics mediate the impact of liberalization of foreign portfolio flows into firms' returns. In summary, during the liberalization process, smaller firms showed higher returns, which means that the revaluation effect for small firms is higher, the opposite result found by Christoffersen, Chung and Errunza (2006).

Cheri and Henry (2004, 2006) studied whether the revaluation effect could be split between firm specific characteristics and the common shock to the whole equity market. The common shock is the risk sharing that affects all firms, regardless of the status of the firm in the stock market as being of an investible firm (a firm that foreign investors would like to add to its portfolio after liberalization) or non-investible firms (firms that

do not possess the characteristics to attract the interest of portfolio investors). The idea is that after liberalization, there is a common shock to expected returns, because as the country moves from being a segmented market to an integrated market, the risk-free rate falls. Specifically, they investigate if firm-specific risk sharing characteristics can be disentangled from the overall revaluation effect. Indeed, authors find that for investible firms (eligible firms) experience an average stock price revaluation of 15%, out of which 40% of this effect is due to firm-specific risk-sharing characteristics. So there is evidence that firm level characteristics mediate the process of equity cost reduction, and that the equity cost reduction benefit may not spillover equally across all listed companies because the equity cost reduction effect is not transmitted only by the common shock to overall domestic equity market free risk rate.

Next some studies that analyzed the impact of portfolio flows in the Brazilian stock market are reviewed. As mentioned in the introduction, these studies focused on market level data and variables. However, from some of the results found in these studies, interesting questions arise about how the market level impacts translate into firm level effects.

Tabak (2003), when analyzing the random walk hypothesis of the Brazilian stock market, showed that inflows of foreign portfolio capitals to the Brazilian stock market had a huge increase after 1994, and that these inflows seem to be induced by increases in the stock market index. Also, these flows helped to increase the efficiency of the Brazilian stock market. He found evidence of cointegration between the IBOVESPA index and international portfolio flows, concluding that the variables have a long-run equilibrium relationship.

Following Veríssimo and Holland (2004), in the decades of 1970 and 1980 loans and financings represented the main source of external resources captured by the Brazilian economy. This tendency changes from 1990 onwards, when foreign direct investment and portfolio investment flows predominate, being foreign direct investments more relevant from 1997 onwards. Among the capitals that flew to the country in the period, short term capitals are to be remarkable, which were seeking arbitrage gains from the high interest rates that were in place in the country.

Among the determinant factors that attracted portfolio capitals to Brazil, Verssimo and Holland (2004) pointed out that the uncovered interest parity and the lower country risk were the main factors that caused these inflows of portfolio capitals, mainly when explaining total portfolio flows and flows to public debt securities. Because of the specificity of stocks and derivative markets, authors found that portfolio flows presented low sensitivity to the uncovered interest parity and the country risk. Meanwhile, the effort put by government by implementing a more liberalized legislation to foreign capitals played a less important role.

Meurer (2006) analyzed the influence of net inflow of resources from international investors on the Brazilian stock market (BOVESPA). The author found that variations in the IBOVESPA index precede a variation in the total participation of foreign investors in the total market capitalization of Brazilian stock market, directly or indirectly. The direct effect occurs when variations in the index precede variations in the share of international investors in the market. The indirect effect materializes from variation in the index to a higher liquidity in the market, and finally higher liquidity attracting more international investors. Hence, investors observe alterations in the index, and based on these alterations they decide whether to invest in stocks or not.

As a description of the behavior shown by international investors in the Brazilian stock market, Meurer (2006) found that portfolio flows to stocks are higher when the index is low, and the outflows are higher when the index is high, showing that portfolio investors are trying to operate in the opposite way with respect to the market, buying stocks when prices are low and selling when prices are high, chasing profitable opportunities.

Franzen et al (2009) studied how the portfolio investment flows to the Brazilian stock market are affected by the return of IBOVESPA index, exchange rate variation, basic interest rate (SELIC) and country risk, between 1995 and 2005, in a monthly base. Their results were in synergy with the ones reported by Meurer (2006) when it comes to the rational behavior of international investors, as they also found that investors join the market after falls and withdraw after rises of IBOVESPA index. Authors found that portfolio investments are positively related to lag returns of the index, showing that international investors consider past returns when building their investment strategies.

They also found that investors try to diminish their exposure to exchange rate risk, withdrawing from the market when the Brazilian currency appreciates compared to the dollar, and also found negative relationship between country risk and portfolio investments, showing that as lower is the relative risk of investing in Brazil, higher are portfolio flows. Basic interest rate (SELIC) affects positively portfolio flows, as investors would anticipate that higher interest would drive inflation down and enhance firms' performance.

2.2 Capital structure

The capital structure of firms is the combination between own capital (equity) and external capitals (debt) chosen by companies to finance their investments and operations. First, a short review on determinants of capital structure is presented. Next, three main theories that were largely used to explain capital structure decisions, which are the Agency Theory, Static trade-off Theory and Pecking Order Theory are briefly discussed.

Capital structure has an important within-industry pattern, as firms usually choose capital structure in ways that it would converge to the average of the industry (Hovakimian, Opler and Titman, 2001). Also, asset specific characteristics also influence capital structure. In industries marked by high tangibility of assets, leverage tends to be higher. Conversely, in industries where intangible assets and discretionary expenses, (SG&A, R&D) are high, the fraction of debt employed is usually lower (Frank and Goyal, 2009).

Following Rajan and Zingales (1995), large firms use more debt on their capital structures. Growing firms normally present growing cash flows too, so debt financing is usually replaced by internal funding. Also, because growing firms are more exposed to risks to their cash flows, implying higher financial distress costs, they rely less on debt (Frank and Goyal, 2009). Perobelli and Fama (2003) argue that growing firms tend to use the equity market to finance new projects. Accordingly, Kayo and Famá (1997) suggested that leverage is lower for growing firms for a sample of Brazilian companies.

More profitable firms use less debt, as they can use retained earnings to finance new investments, recurring to debt only when these internal resources are not enough to cover financing necessities (Kayhan and Titman, 2007). Similar results were suggested by Futema, Basso and Kayo (2009), analyzing Brazilian public companies. Also, high tax benefits possibilities (tax shields) are associated to higher level of debt (Harris and Raviv, 1991). Another important determinant of capital structure is the ownership structure. The more concentrated the ownership, higher the risk aversion and hence lower it is the level of debt reflected in the capital structure of firms (Procianoy and Schnorrenberger, 2004).

Under an Agency-Theory perspective, the decision about which source of financing firms will choose reflect conflicts between managers and equity holders. Financing by debt implies that the firm will have to pay for the cost of this option by doing cash outlays in the future, so that managers would have less cash available to spend in general expenses and perquisites. As argued by Jensen (1986), debt financing could be a way equity holders could discipline manager's expending behavior. In short, under an agency theory standpoint, optimal capital structure would be obtained by balancing the agency costs and the agency benefits of debt between cash claimants (Leland, 1998).

Under the Static Trade-Off theory, as argued by Bradley, Jerrel and Kim (1984), optimal capital structure is achieved by trading-off the tax benefits of debt and the associated risks of financial distress. Firms would define their capital structure precisely by balancing the benefits and costs of financing options (Bancel and Mitoo, 2004). For Shyam-Sunder and Myers (1999), the firm value is maximized when benefits and costs elements equate on their margins. Once firms have identified this point of optimality, they would target the resulting capital structure level. So the decisions of issuing more debt or switching for internally funding over time would reflect this chase of an equilibrium point of debt-to-equity ratio in which firm value is maximized.

The Pecking Order theory has a somewhat different logic. Myers and Majluf (1984) argued that as inside managers are better informed than outside investors about the current value of the firm's equity, the stock market may make mistakes when pricing the value of equity. Hence, financing new projects by issuing new equity would make this underpricing even more severe, and the new investors who acquired the recently issued shares would capture value at the expenses of existing shareholders. Smart et al (2007) point that, if managers maximize current shareholders' value, under these conditions, they would forego projects, even those with positive net present value, to avoid value destruction for current shareholders, causing an underinvestment process in the firm. This problem could be solved by financing new ventures using a security that is not undervalued, which are internal funds and debt (Harris and Raviv, 1991).

For Shyam-Sunder and Myers (1999), the choice between internal cash flows, debt and equity as financing option is done considering the cost of funds. The less costly funds would be internal cash, followed by (moderated-risky) debt, and finally, equity would be issued as a last option. Summing up, Pecking Order Theory advocates that leveraging is a way to reply for a punctual demand for funds, normally when the internal cash flows are not enough to finance new investment opportunities, simply a cost-benefit decision.

3 Methods

3.1 Sampling and data

Our sample consists of the Brazilian firms listed in the BOVESPA stock exchange, classified in the sector Cyclical Consumption, sub-sectors Retail (*Comércio*) and Textiles (*Têxteis, Vestuário e Calçados*). Data was collected in the *Economatica* investment analysis tool for the information regarding firms and from IPEA for information regarding portfolio investment flows and market capitalization of BOVESPA. As of the end of the first quarter of 2012, there were 18 firms listed within this classification for Retail and 28 for Textiles. However, given that the consumer sector in Brazil has boomed in the last years, many of these companies went public not so long ago, what made difficult to build a long panel to analyze all companies.

Therefore, we strove to build the largest panel possible with firms with contemporaneous listing periods, without losing too much of firm heterogeneity. The sample size was maximized (maximum number of firms with contemporaneous listing) using data from the first quarter of 2007 onwards. We dropped from sample as outliers firms that presented too many observations of negative Equity, as it is not logical to study capital structure when the equity is composed mainly of accumulated losses, and also because we use variables built using the total value of Equity in the study (like Market-to-Book ratio).

The final sample, after excluding firms with non-contemporary listing and negative equity included 12 out of the 18 firms from retail and 14 out of 28 firms from Textiles, comprising a balanced panel with 26 firms⁴. Data was collected from the first quarter of 2007 up to the first quarter of 2012, yielding a panel of 520 observations.

⁴ Firms in the sample are: Retail: Dimed, Drogasil, Graziotin, Lojas Americanas, Lojas Marisa, Lojas Renner, Natura, CBD-Pão de Açúcar, Profarma, B2W Varejo, Viavarejo, WLM Ind Com (Walmart). Textiles: Alpargatas, Cedro, Cia Hering, Coteminas, Cremer, Dohler, Grendene, Guararapes, Karsten, Pettenati, Santanense, Springs, Vicunha Têxtil and Vulcabras.

Because the study does not analyze a sample containing firms that are representative of all sectors of the economy, it is important to clearly explain the sampling motivation. Considering the consumption-based growth cycle that the Brazilian economy is experiencing in the last years, it is reasonable to assume that firms from the cyclical consumption sector would capture a good share of the economic growth in their profits. Also, international portfolio flows are likely to be attracted to profitable and growing firms (Christoffersen, Chung and Errunza, 2006). So the departing intuition is that firms from cyclical consumption sector should benefit from international portfolio flows. As firms receive portfolio flows, it is possible to evaluate how these flows interact with their capital structure⁵.

To answer to the second question of the study, which is how growth and size can influence or mediate the relationship between international portfolio flows and capital structure, it is required that the sectors/ firms in the sample present differences in growth across time (as there are regular size differences in any sample). This reason motivates the specific choice for retail and textiles.

Retailers can capture most of the consumption growth cycle, for the obvious reason that they are selling the goods to consumers in the first place. Of course there is competition from international retailers and imported goods, but in practice, most retailers internalize the import process of products, as they have a better knowledge and domain of the domestic distribution channels. Textiles industries, on the other hand, should also capture some part of the consumption-based growth cycle, however under lower levels. Industry suffers fiercer competition from international suppliers (mainly textile industry suffering from competition from China and East Asia).⁶ Summing up, it is reasonable to assume that retailers should receive more international portfolio flows than textile firms, as they capture a larger share of the consumption-based growth. Hence it is possible to check whether growing firms, receiving more flows, make stronger adjustments in their capital structures.

Instead of just assuming that the premises we considered for choosing the sectors for the sample hold, it yields robustness to the study to check it with empirical data. To do so, the idea was first to evaluate whether the firms from these sectors were indeed perceived as good investment opportunities by international portfolio investors, and second if they differ in terms of growth. We calculated the sensitivity between each firm's Market-to-Book ratio (MBK, a common used proxy for investment or growth opportunities) and the Net Portfolio Flows into the Stock Market divided by total BOVESPA capitalization (PF_stocks) for a sample of firms belonging to both sectors from the second quarter of 2007 to the first quarter of 2012⁷, using the regression model number 1 described in section 3.3. In the table presented next a brief summary of the results is reported:

Table 1 – Sensitivity of MBK ratio (lnMBK) to Portfolio Flows for Retail and Textile firms – 2Q07-1Q12

	Retail	Textile
Number of Observations	240	280
Number of firms	12	14
Median MBK ratio	2.75	0.835
Sensitivity of MBK to PFs	2.29***	1.44***

*** Significant at 0.01 level

Source: *Economatica* and *IPEA* (computed by author)

As we can see from the table above, the median market-to-book ratio for retail firms is 2.75 versus 0.835 for textile firms, which shows that for the period between 2nd quarter of 2007 to the 1st quarter of 2012, the growth opportunities (market-based assessment done by investors) for retail firms were over three times higher than those for textile

⁵ Data on international capital flows that goes specifically to each firm in each period of time is not publicly available, or if it is, not in aggregate databases, so we must rely on market data and econometric estimations to assess how these flows interact with firm-specific attributes.

⁶ The logic behind the comparison is that for retail, there is less competition from tradable goods, whereas textile sector should suffer way more from this sort of threat coming from abroad.

⁷ More in depth information about variables and methods is provided later on the specific section, but we anticipate some of the results to ease reader's understanding of study's motivation.

firms. This higher growth opportunity is corroborated by the sensitivity of Market-to-Book ratio to Portfolio Flows to Stocks. For retail the sensitivity was 2.29 whereas textile had 1.44, implying that Portfolio Flows to Stocks had a positive marginal impact on the market-based assessment of growth ratio opportunities of firms from both sectors, but for retail this impact is almost 60% higher.

Hence, data supports the assumption that both sectors were considered attractive by portfolio investors, and that retailers would receive more portfolio flows as firms in this sector grew more in comparison to textile firms in the period analyzed. These preliminary results suggest that it is coherent to evaluate how portfolio flows may impact the capital structure of firms using data from firms coming from these two sectors.

Data for firms was collected from *Economática* investment analysis tool. For the time series for portfolio flows to stocks and total capitalization of BOVESPA data is from IPEA (2013) (*Instituto de Pesquisa Econômica Aplicada*) and was collected in quarterly basis.

3.2 Analytical variables

In this section the analytical variables employed to investigate the relationship between capital structure and international portfolio flows are described. We build on variables used in prior studies, making slight adaptations when required by the specificity of this study.

Capital structure

Capital Structure was measured by total debt as a fraction of total assets, following the formula:

$$D / A = \frac{Debt}{Total_Assets}^8$$

Net portfolio investment flows to stocks

We follow Meurer (2006) and Franzen et al (2009), using a similar measure for Net Portfolio Flows to Stocks. The variable was calculated by the ratio between Net Portfolio Flows to Stocks (inflows minus outflows in each quarter), measured in US\$ dollars and the total market capitalization of BOVESPA also measured in US\$ dollars.

$$PFstocks = \frac{Net_Portfolio_Flows_Stocks}{BOVESPA_Mkt_Cap}$$

Control variables

Following prior research in capital structure, it was aimed to control for aspects that may influence the capital structure, allowing for a ceteris paribus effect of portfolio flows into this variable. When controlling variables that share correlation with the independent variables are not controlled for in a linear regression model, being these variables omitted, the effect of the independent variable (s) on the dependent variable is not a ceteris paribus or isolated effect (Wooldridge, 2004).

Because sample is not too large, only a few controlling variables that were considered to potentially interact with portfolio flows, so that is interesting to disentangle their effects into capital structure, were chosen to be incorporated to the model, to preserve degrees of freedom and parsimony.

Size:

Size normally is positively related to leverage, as argued by Rajan and Zingales (1995), larger firms have more valuable collateral assets to guarantee the service of debt, and hence

⁸ Debt in the *Economática* database is defined as the sum of Loans and Financings.

can borrow money at lower rates. We used the natural log of Total Assets to control for the size effect. Also, prior research suggested that portfolio capitals may flow into larger firms, as they are more profitable (Christoffersen, Chung and Errunza, 2006).

Liquidity:

For liquidity, Meurer (2005) argued that because international investors may behave differently from domestic investors, it is not possible to consider that portfolio flows and the traded volume (liquidity) are substitute variables. As liquidity usually impacts capital structure by reducing leverage (Lipson and Mortal, 2009, Morellec, 2001), it is important to control for this effect, allowing to disentangle the effects of portfolio flows and liquidity into the capital structure. Following Amihud (2002), the natural log of market value of equity was used as a proxy for liquidity.

Growth opportunities:

Titman and Wessels (1988) state that growth impacts leverage, being negatively related to indebtedness for three basic reasons. First, firms that are equity-controlled have a tendency to invest sub-optimally and expropriate wealth from shareholders, constituting an agency problem that is likely to be higher in growing firms. Second, companies acting in growing industries tend to have more flexibility in their choice of future investments. Third, growth is an asset that cannot be collateralized and yields no current taxable income. Hence, growth opportunities and leverage should have a negative relationship.

However, Myers (1984) argues that if growing firms trade long term financing by short term financing, growth opportunities may be positively related to leverage. Hence it is important to control for this variable, but the sign of the relationship can be ambiguous. Growth opportunities may interact with portfolio flows because growing firms should have growing profits, and as showed by previous studies, portfolio investors chase profit window opportunities (Tabak 2003, Verissimo and Holland, 2004, Meurer, 2006, Franzen et al, 2009). Following prior studies we used the Market-to-Book ratio, which is the ratio between the market value of equity and the book value of equity, to control for growth opportunities. For modeling procedures the natural log transformation was used.

Cash holdings:

Ferreira and Vilela (2004) argue that the relationship between leverage and cash holdings is also ambiguous. Because leverage increases the probability of bankruptcy, for the higher pressure of amortization plans on firms' treasury management, levered firms would hold more cash to reduce this financial distress risk. Conversely, leverage ratios are a proxy for the ability of firms to issue debt, hence higher leverage would imply less cash holdings because levered firms have easier access to debt market and may issue debt with lower costs. The possible interaction with portfolio flows may come from the fact that firms' cash holdings allow managers to make investments easily, preventing underinvestment in positive NPV projects, and hence high cash holdings are valued by outside shareholders and investors (Kalcheva and Lins, 2007). Cash holdings were measured by dividing Cash & Cash equivalents by Total Assets.

3.3 Modeling procedures

We modeled the data using panel multivariate regressions following Wooldridge (2004) and Gujarati (2006). Among the three basic panel models suggested by Wooldridge (2004), which are the fixed effects, first-differenced and random effects estimators, we chose to use the first-differenced estimator. The advantage of the first-differenced

estimator is that it usually controls for serial autocorrelation of the idiosyncratic errors (Wooldridge, 2004).

Also, it holds constant the unobserved effects of the regression, that is, specific characteristics of each cross-sectional group that are invariant over time and can have effects on the model. As argued by Wooldridge (2004), when the unobserved effects are correlated with the explanatory variables, the model has serial autocorrelation. In these cases, the first-differenced estimator corrects for serial autocorrelation because the unobserved effect is “differentiated-away”⁹. After the first-difference operator is computed, it is correct to use the Ordinary Least Squares estimator (OLS), controlling for the presence of multicollinearity, heteroskedasticity, and making sure autocorrelation is controlled.

We applied the first-difference operator to the variables, generally defined as:

$$\Delta x_{i,t} = x_{i,t} - x_{i,t-1} \quad (5)$$

Then we estimated regressions using first-differenced operators of variables, following the generic model:

$$\Delta y_{i,t} = \alpha + \beta_1 \Delta x_{1,i,t} + \beta_2 \Delta x_{2,i,t} + \dots + \Delta u_{i,t} \quad (6)$$

We test for serial autocorrelation of errors using Durbin-Watson statistic, as suggested by Gujarati (2006). DW statistics between 1.7 and 2.0 indicate there is no autocorrelation. To control for heteroskedasticity we run regressions with robust standard errors, as they correct for this problem (Wooldridge, 2004). For multicollinearity we used the test of Variance Inflation Factors (VIF), in which values for the single VIF statistic for the coefficient of each regressor that are below 10 indicates absence of multicollinearity. Also, the correlation matrix between variables can give hints about potential problems of multicollinearity if independent variables show strong correlation among each other. The results of these tests are reported together with the regressions output tables in the results section. For the regressions we used the softwares *STATA* and *Gretl*.

3.4 Models

Before running the model of interest of this study, we tested with empirical data whether the choice of Sector and Sub-Sectors for the sample was indeed reasonable and correct, going beyond assumptions made on expected theoretical results. We tested for the sensitivity of stocks to portfolio investment flows, by running a regression between the natural log of Market-to-Book ratio ($\ln MBK$) and the Net Portfolio Flows to Stocks as percentage of Total Market Capitalization of BOVESPA (PFstocks), controlling for firm size ($\ln TA$), as described in model 1:

$$\Delta \ln MBK_{i,t} = \alpha + \beta_1 \Delta PFstocks_{s,t} + \beta_2 \Delta \ln TA_{i,t} + \Delta \varepsilon_{i,t} \quad (7)$$

where,

$\ln MBK$ is the natural log of the Market-to-Book ratio of firm i in time t ;

PFstocks is the Portfolio Flows to Stocks to the Brazilian stock market s in time t^{10} ;

$\ln TA$ is the natural log of Total Assets of firm i in time t .

⁹ It was the case of the present sample, as the model estimated using variables in level with both fixed effects and random effects estimators exhibited serial autocorrelation.

¹⁰ Prior studies (Patro and Wald, 2005; Christoffersen, Chung and Errunza, 2006) that analyzed the impact of financial liberalization on firm specific characteristics also used panel regressions using both data at firm level and country level as explaining variables. Country level data was either a dummy variable for liberalization dates or a simple dummy to denote the country.

To compare the sensitivity of stocks to portfolio flows between the two sub-sectors of sample (retail and textile), a categorical variable dividing the sample between the two sub-sectors was created (1 = Textile; 2 = Retail), and the same model was run.

After confirming the sensitivity of firms in the sample to the portfolio flows, the regression model between capital structure, portfolio flows and other controlling variables was defined, as described in model 2:

$$\Delta D/A_{i,t} = \alpha + \beta_1 \Delta PFstocks_{s,t} + \beta_2 \Delta \ln TA_{i,t} + \beta_3 \Delta \ln MVE_{i,t} + \beta_4 \Delta \ln MBK_{i,t} + \beta_5 \Delta C/TA_{i,t} + \varepsilon_{i,t} \quad (8)$$

where:

D/A is debt to total assets of firm i in time t ;

PFstocks is the portfolio flows to stocks to the Brazilian stock market s in time t ;

lnTA is the natural log of Total Assets of firm i in time t .

lnMVE is the natural log of the market value of equity of firm i in time t ;

lnMBK is the natural log of the Market-to-Book ratio of firm i in time t ;

C/A is the Cash-to-Assets ratio of firm i in time t .

To check whether the capital structure adjustment that firms experienced following portfolio inflows are impacted by firm characteristics like size and growth, a categorical variable dividing the sample between two groups for each characteristic was created, using the Median of each variable as a relative parameter to define the characteristic of each firm in a given period of time as high or low relative growth and small or large relative size.

The groups were constituted using a relative measure in comparison to other firms from the same sub-sector (retail or textile) to avoid making comparisons of size and growth between firms from different sub-sectors, that may have important structural differences in assets or growth rates (for example, more or less fixed assets). After defining the groups, the same regression described in model 2 was estimated using the bysort option of the software *Stata*. The table below summarizes the criteria and the groups:

Table 2 – Categorical Variables defining Groups for Size and Growth – 1Q07-1Q12

	Retail sector	Textile sector
Number of Observations	252	294
Number of firms	12	14
Median value for variable TA (Size)	R\$ 1,474,198.5	R\$ 666,676.5
Median Value for variable MBK (Growth)	2.786	0.835
Large Relative Size	TA i,t > Median	TA i,t > Median
Small Relative Size	TA i,t < Median	TA i,t < Median
High Relative Growth	MBK it > Median	MBK it > Median
Low Relative Growth	MBK it < Median	MBK it < Median

Source: *Economatica* (computed by author)

4 Results

4.1 Descriptive statistics

The tables below present the main descriptive statistics for the variables analyzed in the study. We show variables on their level results (we don't show statistics for the first-differences and logs). The first table refers to the full sample and the second one to the descriptive statistics disaggregated for Retail and Textile sub-sectors.

Table 3 – Descriptive Statistics for the Full Sample – 1Q/07 to 1Q/12

	D/A	PF_stocks	C/A	MBK	TA (R\$ millions)	MVE (R\$ millions)
N	546	21 (x 26)	546	546	546	546
Mean	22.5 %	2.3 %	15.3%	3.94	2,224	2,509
Median	19.8 %	2.0 %	11.6%	1.59	1,999	603.5
Standard Dev.	17.9 %	3.5 %	13.5%	6.54	4,131	3,991
Max.	70.2 %	8.5 %	62.0%	47.9	33,769	22,623
Min.	0.00 %	-7.4 %	0.00%	0.20	71.3	23.1

Source: *Economatica* for firm data; IPEA for portfolio investment flows and market capitalization of BOVESPA.

Table 4 – Descriptive Statistics for Retail and Textile sub-sectors – 1Q/07 to 1Q/12

	D/A		C/A		MBK		TA (R\$ millions)		MVE (R\$ millions)	
	Retail	Textile	Retail	Textile	Retail	Textile	Retail	Textile	Retail	Textile
N	252	294	252	294	252	294	252	294	252	294
Mean	23.1%	21.9%	18.2%	12.7%	6.8	1.5	3,481	1,148	4,453	843.6
Median	20.9%	19.4%	18.0%	6.3%	2.8	0.8	1,474	666.7	2,339	407.7
Standard Dev.	19.9%	15.9%	10.1%	15.5%	8.6	1.7	5,732	1,042	5,092	1,177
Max.	69.8%	70.2%	50.5%	62.0%	47.9	9.9	33,769	4,234	22,624	7,706
Min.	0.0%	0.0%	0.8%	0.0%	0.3	0.2	145.0	71.36	129.0	23.2

Source: *Economatica*.

For the full sample, the median debt-to-assets ratio was 19.8%, while median cash-to-assets ratio was 11.6%. When we evaluate the values for each sector separately we see that retailers showed a slightly higher median leverage when compared to textile firms (20.9% vs 19.4%). On the other hand, for cash-to-assets there is a large difference between sectors, as retailers had median cash holdings of 18% versus 6.3% for textile firms.

The median market-to-book ratio of the full sample was 1.59, while retailers individually presented a median market-to-book ratio of 2.8 versus 0.8 for textile firms, showing the higher growth opportunities expectations put by investors in retail firms. It is worth noting that there is high heterogeneity when it comes to size in both aggregate sample and between and within sectors. Some firms have an assets base of R\$ 33 billions while others of 71 millions. The same pattern is seen for market value of equity.

The median net portfolio flows as a percentage of total market capitalization of BOVESPA was 2%. The positive median shows that in the period inflows outperformed outflows. The highest net inflow was 8.5%, while the highest net outflow was -7.4%.¹¹

The table number 5 shows the correlation matrix between variables:

Table 5 – Correlation Matrix for variables (after first-differencing) - Full Sample – 1Q/07 to 1Q/12

	D/A	PF_stocks	C/A	lnMBK	lnTA	lnMVE
D/A	1.00					
PF_stocks	-0.09**	1.00				
C/A	0.17***	0.05	1.00			
lnMBK	0.23***	0.25***	-0.13***	1.00		
lnTA	0.03	-0.03	0.31***	-0.24***	1.00	
lnMVE	-0.11***	0.29***	0.05	0.64***	0.18***	1.00

*** Significant at 0.01 level; ** Significant at 0.05 level; *Significant at 0.1 level

Source: *Stata*, computed by Author.

In general debt-to-assets is correlated to all independent variables, except total assets. There is negative relationship between debt-to-assets and portfolio flows to stocks, according to expectations. It is worth noting that among the independent variables, the only strong correlation that could possibly generate some problem of collinearity is between market-to-book ratio and market value of equity. Correlation is 0.64, which is moderate strong, but variables are far from perfect collinearity. Anyway, multicollinearity tests are performed for the regression model.

4.2 Regressions

Table 6 shows the results for the regression model number 1, between the natural log of market-to-book ratio and portfolio flows to stocks, controlling for firm size using the natural log of total assets. We recall that the objective of this model was to evaluate

¹¹ It is worth reminding that volumes seem small because we used net portfolio flows, portfolio investment inflows minus outflows divided by the market capitalization of BOVESPA, both variables in quarterly basis.

whether the stocks of firms in the sample were indeed sensible to portfolio flows, by assessing the impact of portfolio flows into their market-to-book ratios.

Table 6 – Model No.1 Output - OLS regression with Robust Standard Errors

Dep.Var: lnMBK	Full Sample	Sector	
	Coefficients	Retail	Textile
<i>constant</i>	-.000 (.011)	.004 (.017)	-.003 (.015)
<i>PFstocks</i>	1.83*** (.301)	2.29*** (.408)	1.44*** (.442)
<i>lnTA</i>	-.526*** (.011)	-.557** (.215)	-.517*** (.183)
<i>N</i>	520	240	280
<i>R-squared</i>	.1205	.1412	.1039
<i>DWatson¹</i>	1.80		
<i>Max. VIF</i>	1.004		

*** Significant at 0.01 level; ** Significant at 0.05 level; * Significant at 0.1 level

Source: *Stata and Gretl*, adapted by author.

As anticipated in the previous section, the market-to-book ratio sensitivity to portfolio flows, after controlling for firm size, is positive and statistically significant (1.83 for the full sample). Retailers have a higher sensitivity of their market-based growth opportunities, as the coefficient is 2.29 versus 1.44 for textile firms. This preliminary result confirms that firms from both sectors were found attractive by portfolio investors, and that retailers should receive a higher flow of capitals due to higher growth expectations.

Also, Market-to-Book ratio is often used as a valuation ratio (Lang and Stulz, 1993), allowing to interpret the positive marginal effect of portfolio flows in the later variable as an evidence that portfolio flows produced an increase in the value of equity¹², hence lowering the expected return on the stocks following risk reduction, leading to an equity cost reduction.

Table 7 – Model No. 2 Output - OLS regression with Robust Standard Errors

Dep.Var: D/A	Full Sample	Sector		Size		Growth	
	Coefficients ²	Retail	Textile	Large	Small	High	Low
<i>constant</i>	.002* (.001)	.002 (.002)	.003* (.001)	.004* (.002)	.001 (.001)	.008*** (.002)	-.000 (.001)
<i>PFstocks</i>	-.106*** (.038)	-.168*** (.063)	-.085* (.048)	-.111* (.059)	-.090** (.045)	-.109* (.064)	-.077* (.039)
<i>lnTA</i>	.089*** (.034)	.095** (.041)	.084* (.048)	.0782** (.039)	.076** (.032)	.014 (.024)	.136*** (.036)
<i>lnMVE</i>	-.108*** (.012)	-.083*** (.015)	-.152*** (.031)	-.073*** (.026)	-.122*** (.015)	-.130*** (.023)	-.110*** (.010)
<i>lnMBK</i>	.112*** (.011)	.098*** (.014)	.149*** (.033)	.078*** (.023)	.122*** (.016)	.121*** (.025)	.114*** (.010)
<i>C/TA</i>	.184** (.075)	.178*** (.065)	.176 (.128)	.265*** (.065)	.111 (.128)	.225** (.087)	.183** (.086)
<i>N</i>	520	240	280	265	255	256	264
<i>R-squared</i>	.3285	.3497	.3627	.2543	.4682	.3133	.4502
<i>F-Statistic</i>	25.92***	11.06***	8.36***	7.79***	15.82***	12.36***	27.97***
<i>DWatson</i>	1.88						
<i>Max. VIF³</i>	2.301 (lnMVE)						

*** Significant at 0.01 level; ** Significant at 0.05 level; * Significant at 0.1 level

Source: *Stata and Gretl*, adapted by author.

Table number 7 presents the results for the model number 2, estimated having the debt-to-assets ratio as the dependent variable, portfolio flows to stocks as the main independent variable, controlling for firm size ($\ln TA$), liquidity ($\ln MVE$), growth opportunities ($\ln MBK$) and cash holdings (C/TA). In the first column the variables are displayed. The second column brings the results for the full sample. The columns next show results for the group regressions, in which the sample was divided according to firm characteristics of sector, size and growth opportunities.

The regression for the full sample is statistically significant ($F_{stat} = 25.92$, $p < 0.01$), with R -squared of 0.3285. The Durbin-Watson statistic attests that there is no serial autocorrelation ($DW = 1.88$, values between 1.7 and 2.0 indicate no autocorrelation), and the test for the presence of multicollinearity did not point any problem in this sense, as the Variance Inflation Factors (VIF) values are way below 10.0.

Portfolio Flows to Stocks (PFstocks) had negative coefficient (-0.106 , $p < 0.01$), confirming the initial expectation that higher portfolio flows should produce a negative marginal effect on the leverage of firms, as it reduces the expected returns on the stocks, lowering the cost of equity, and hence causing adjustments in the capital structure of firms. For each 1% of portfolio flows to the stock market relative to total market capitalization of BOVESPA, the debt-to-asset ratio of firms in the sample was reduced by 0.106%.

This result is consistent with prior studies that showed that equity cost reductions are associated to portfolio capital inflows (Meurer, 2006, Franzen et al, 2009, Tabak, 2003, Christoffersen, Chung and Errunza, 2006, Patro and Wald, 2005). The feature that this result adds is that firms adjust their capital structure following equity cost reductions, reducing leverage to respond to a potential marginal cost decrease of equity relative to debt.

All the controlling variables were statistically significant, what justifies their inclusion in the model. Size, measured by $\ln TA$, had positive coefficient (0.89 , $p < 0.01$), meaning that larger firms employ more debt in their financing structure. This finding is consistent with prior studies, as size is a classic determinant of leverage (Titman and Wessels, 1988, Rajan and Zingales, 1995, Brito, Corrar and Batistella, 2007).

Liquidity, measured by $\ln MVE$ was negatively related to debt-to-assets (-0.108 , $p < 0.01$), suggesting that firms that have higher liquid stocks are less levered. This result is in line with prior research that found negative relationship between liquidity and leverage (Lipson and Mortal, 2009; Morellec, 2001). More liquid stocks imply equity cost reduction, and hence, lower levels of debt. However, because market value of equity can have also a size and performance interpretation, this negative coefficient can have further interpretation. In the specific model estimated, market value of equity does not seem to proxy for size, because it has inverse signal with respect to total assets. However, if we analyze it as a proxy for performance, the negative coefficient would imply that firms with better financial results, reflected by a higher market capitalization, employ less debt in their capital structure (Kayhan and Titman, 2007), which is also in line with prior studies.

Growth Opportunities, measured by $\ln MBK$, had a positive marginal effect on debt-to-assets (0.11 , $p < 0.01$). Interpretation would be that higher growth opportunities are associated with higher levels of leverage, meaning that firms would be prone to finance projects to keep growing with external resources. Prior studies found ambiguous results for the impact of growth opportunities in leverage, but there is more evidence in favor of a negative relationship (Titman and Wessels, 1988), so this result is somewhat unexpected. One possible explanation is that growing firms are also large firms, so they can finance projects to grow both with internally generated cash flows and with debt, because their large assets base would serve as collateral and allow for borrowing at low costs.

Cash holdings, measured by C/TA , had also a positive marginal impact on leverage (0.184 , $p < 0.05$). Higher levels of cash are associated to higher leverage, which was an unexpected result. Past research indicates that these variables should have a negative

¹² Indeed, to double-check this result, a regression between the natural log of Market Value of Equity and Portfolio flows to stocks was estimated, and yielded a positive coefficient for PFstocks (1.95, significant at 0.01 level).

relationship, as higher cash holdings imply that firms have internally generated resources to finance new projects, relying less on debt (Ferreira and Vilela, 2004). On the other hand, the same authors argue that levered firms are more exposed to bankruptcy risks, and may hold higher cash positions to reduce the probability of financial distress. One second explanation, following the argument developed by Portal, Zani and da Silva (2012) in their study of Brazilian firms, is that when firms are subject to high external financing costs (constrained firms), internal and external funds are more complementary than substitute forms of financing, so a negative relation between cash holdings and leverage may hold, and variables can be positively related.

Portfolio flows to stocks and the controlling variable for liquidity showed the same negative signal, which is interesting and deserves to be commented. Although Meurer (2006) argued that portfolio investment flows and liquidity cannot be considered substitute variables, because international investors behave differently from domestic ones, it seems possible that the negative marginal effect caused by portfolio flows on debt levels acts in the same way as liquidity, as indeed theory on portfolio flows predict that these flows cause an equity cost reduction because they reduce the risk associated to the stock, which is the same effect of liquidity into stocks, because, as argued by Amihud and Mendelson (2006), liquid stocks trade at premium because illiquid stocks are riskier, as it is harder to get rid of illiquid stocks.

It is interesting to give an interpretation of the results in light of financial theories that explain the capital structure decision of firms. It was seen that portfolio flows produced marginal reduction in the leverage of firms, which can be associated to the reduction in the cost of equity that follows portfolio flows. As argued by Shyam-Sunder and Myers (1999), the Pecking Order Theory advocates that the choice between internal cash flows, debt and equity as financing option is done considering the cost of funds. The less costly funds would be internal cash, followed by (moderated-risky) debt, and finally, equity would be issued as a last option. The choice between debt and equity funding would be simply a cost-benefit decision.

Although Pecking Order predicts that equity financing is the most expensive option, the theory postulates that capital structure adjusts in function of the marginal cost of funds available. Nothing can be said about absolute costs for equity and debt in this study, but both results and theory support a marginal reduction in the equity costs, which can lead to marginal trading between debt and equity. Hence, in light of Pecking Order, results are reasonable.

After having seen that portfolio investment flows have a negative effect on the debt-to-asset ratio of firms in the sample, after controlling for important variables that affect capital structure, next the role of firm characteristics are analyzed. The third and fourth columns of Table 7 report results for the Retail and Textile sectors separately. The first interesting result is that the marginal effect of portfolio flows into the capital structure is two times stronger for firms in the retail sector then for firms in the textile sector (-0.168 , $p < 0.01$ versus -0.085 , $p < 0.1$). The controlling variables are all statistically significant (except for Cash Holdings, C/TA) in the textile group regression, and preserve the same signals as they had in the full sample model.

This result suggests that retailers went through stronger adjustments in their capital structures, probably because the dynamicity of the sector has attracted more portfolio capitals, and hence firms from retail sector were likely to have had higher reductions in their equity cost, which allowed them to implement stronger adjustments in their debt levels.

Columns 5 and 6 of Table 7 present the results for the regression after dividing sample in two groups using a relative measure for Size. Large firms were characterized by having the size of assets base, measured by $\ln TA$ higher then the sub-sector's (retail or textile) median, and Small firms were defined in the opposite way. Portfolio flows to stocks caused a higher negative marginal effect on large firms (-0.111 , $p < 0.1$) than in

small firms (-0.09 , $p < 0.05$) as can be concluded by comparing the coefficients (although this difference is small). Controlling variables are all statistically significant (once more except for Cash Holdings in the Small group regression), and kept the same signals as in the full sample model.

The result reported above suggest that portfolio investors may prefer to invest in larger firms (although this conclusion is indirect), and also that portfolio capitals cause stronger capital structure adjustments for larger firms. However, because the difference between the coefficients of the regressions for the groups Large and Small is very small, it is not wise to draw any strong conclusion out of it, being more cautious to leave it as a suggestion. However, this result is in synergy with Christoffersen, Chung and Errunza (2006), as they found that larger firms experience higher revaluation effects after large waves of capital inflows, as these revaluation effects cause higher reductions in the cost of equity for large firms relative to small firms.

The last analysis pertains to Growth aspect. It was possible to have a clue about the importance of growth as a mediator between the effect of portfolio flows into the capital structure by evaluating differences between the Retail and the Textile sector. However, since it is very possible that firms in the Textile sector have presented also high growth trajectory during the period covered by the study, it yields completeness to estimate the same regression model but dividing the sample by high or low relative growth using the criteria described in the method section. High relative growing firms had Market-to-Book ratios superior than sector median, and low relative growing firms the opposite. Columns 7 and 8 of Table 7 report the results for the regressions.

High Growth firms had a stronger negative marginal effect of portfolio flows into their leverage level (-0.109 , $p < 0.1$) when compared to Low Growth firms (-0.077 , $p < 0.1$). Again, difference in coefficients is not too large, but is larger than for the Size comparison.

The results of the last two analyses suggest that some firms benefit more from portfolio flows than others. Because the marginal reduction of leverage caused by portfolio flows can be associated to a reduction in the cost of equity due to lower expected returns in these firms' stocks, it is likely that firms that are larger and that have higher growth opportunities receive more portfolio flows and hence benefit more from the equity cost reduction.

Rajan and Zingales (1995) argue that larger firms are likely to have lower growth opportunities. Following this line of reason, smaller firms, instead, which have higher growth opportunities could benefit more from portfolio inflows, having a higher equity cost reduction when compared to large firms, if investors value growth, as suggested by Patro and Wald (2005). However, because in Brazil the cost of capital is higher when compared to countries with more developed capital markets, firms suffer from credit constraints (Terra, 2003). The tendency that smaller firms should have more growth opportunities may not hold, as argued by Bisinha and Aldrichi (2007), because small firms suffer more from financial constraints and hence fall short of cheap credit to finance projects that could boost growth. Thus, larger firms, with privileged access to financing funds, whether debt, equity or internal funds, can share the characteristics of being large and still having higher growth opportunities with respect to smaller firms. This could be the reason why firms that are larger and that also have higher growth opportunities had stronger negative effects from portfolio flows to their leverage level: we can be talking about the same firms.

5. Conclusions, limitations and further research

The main purpose of this study was to evaluate whether firms exposed to portfolio investment flows, which following prior studies, reduce the cost of equity of firms by reducing the expected return on their stocks by introducing a risk sharing between

domestic and international investors, implement capital structure adjustments to respond to this marginal equity cost reduction. The idea was to bring a firm-level analysis to the field of research of portfolio investment flows, and also to combine it with corporate capital structure research, since portfolio investments are important financing funds available to firms in countries that are growing and hence receiving large waves of international capital flows.

The results provide evidence that portfolio investment flows have a negative marginal effect on the debt-to-assets ratio of firms in the sample (which included firms from the cyclical consumption sector, retail and textile sub-sectors, as per the BOVESPA classification criteria), after controlling for firm size, liquidity, growth opportunities and cash holdings. Because other sources of funds become marginally cheaper than debt following portfolio investment flows, firms do marginal trading between debt and equity funding.

The regressions estimated considering firms characteristics for sector, size and growth opportunities separately showed that some firms benefited more from portfolio investment flows, implementing stronger marginal reductions in leverage due to equity cost reductions. Firms from the retail sector exhibited a marginal decrease in leverage due to portfolio flows almost two times larger than firms from the textile sector, likely because the sector captures a larger fraction of the consumption-based growth cycle that the Brazilian economy is experiencing since the last decade, and hence portfolio investors may be more attracted to buy stocks of retail companies.

Larger firms and firms with higher growth opportunities also had stronger adjustments in their leverage ratios following portfolio investment flows, signaling that firm specific characteristics can mediate the equity cost reduction. Because smaller firms in Brazil are more exposed to credit constraints, it is possible that they have lower growth opportunities, attracting less portfolio investments and hence benefiting less from equity cost reduction and finally implementing weaker adjustments in their debt ratios.

These findings suggest important policy implications, in the sense that the benefits of portfolio investments may not spillover equally; they may favor big businesses that already enjoyed better funding possibilities, which allowed for higher growth. Hence, public policies directed to foster international portfolio investments, or the very “pull effects”, that are internal features of the economy that attract foreign capitals, like macroeconomic stabilization, liberalizing legislation, economic growth, etc, can have positive effects in generating general equity cost reductions for Brazilian firms, thus increasing the general level of investment by making the cost of capital lower. However, these portfolio flows seem to do little (or relatively less) for small and low-growth firms when compared to large and high-growth firms.

This study has several limitations, leaving open questions to further research. The sample is not representative of the whole Brazilian business environment, so it is important to verify whether the results found in this study apply for other sectors, like heavy industry, capital goods, technology-based sectors and services, etc.

Also, although 520 observations is enough to work with multivariate regressions, it must be acknowledged that sample is quite small, because more data that would fit the criteria of contemporaneous listing was not available, because few firms from both sectors are listed since long time ago, many of them having gone public exactly as a response to the consumption boom in the Brazilian economy. One possibility is to incorporate other firms from other Cyclical Consumption sub-sectors, like services, travel & leisure, hotels & restaurants, car renting, domestic appliances, etc.

One first limitation regarding the model that can be explored by further research concerns the relationship between liquidity and portfolio investment flows. Although each variable had its own *ceteris paribus* effect on leverage, and that prior studies suggested

that international portfolio flows cannot be understood just as “international liquidity”, both variables share the same rational to reduce the cost of equity that is risk reduction. Further studies can try to go further in disentangling the effects of portfolio flows and liquidity into firm capital structure.

The second main limitation that comes from the modeling procedure that should be highlighted is that the sensitivity of debt levels to portfolio investment flows was estimated using aggregate data for portfolio flows, because data on portfolio flows that go to each firm in each quarter is not available in databases (maybe being available in firms CVM reports, but data collection would have to be manual). However, because the econometric estimation yielded fine results, without any violations to the linear regression model, and the coefficients between portfolio flows and leverage were statistically significant in all regressions, it can be considered a good first approach.

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