



Why do Latin American firms hold so much more cash than they used to?

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Why do Latin American firms hold so much more cash than they used to?

Results and contributions of the article: We document an increasing trend for corporate cash holdings in a sample of selected Latin American firms between 2000 and 2014. Along the same lines, net leverage and short term debt show a declining trend over the same period. We find that the trade-off theory may account for this. We also find a substantial effect of macroeconomic variables particularly affecting firms operating in the region, such as exchange rate risks.

Purpose of the work: We intend to assess whether the trade-off or the pecking order theories explain the increase in cash ratios for Latin American firms. Additionally, we seek to test the explanatory power of additional variables capturing key macroeconomic features of Latin American economies.

Relevance of the chosen theme: Because of its noticeable increase, cash became a key feature of Latin American firm performance in the last decades. The need for a better understanding is stressed by the fact that during most of the last decade, these experienced a phase of accelerated economic growth and buoyant financial markets. The resulting surge in real investment opportunities along that period makes the growing cash holdings all the more puzzling.

Impact on the area: As far as we are concerned, no other study addresses this issue in a direct manner. We document strong facts regarding the increase of cash holdings for Latin American firms. We assess traditional explanations and decide which fits more properly to our sample. We build and evaluate empirically a complimentary explanation connected to ER exposure and key macroeconomic variables.

Methodology: To address potential sources of endogeneity, we use dynamic panel data methods. In particular, we apply the system Generalized Method of Moments proposed by Blundell and Bond (1998).

Keywords: corporate finance, cash holdings, capital structure

JEL Code: G3, G30, G32

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7 *Resumo*

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9 *Resultados e contribuições do artigo:* Documentamos um crescimento dos recursos
10 financeiros mantido em caixa numa amostra de empresas latino-americanas entre 2000 e 2014.
11 Da mesma forma, a alavancagem financeira e a dívida de curto prazo apresentam uma tendência
12 decrescente ao longo do mesmo período. Acreditamos que a teoria do trade-off pode explicar
13 esse fenômeno. Também encontramos um efeito substancial das variáveis macroeconômicas,
14 que afetam particularmente as firmas da região, e também os riscos cambiais.
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18 *Objetivo do trabalho:* Pretendemos avaliar se as teorias do trade-off ou “pecking order”
19 explicam o aumento dos índices de caixa para as empresas latino-americanas. Além disso,
20 procuramos testar o poder explicativo de variáveis adicionais que capturam características
21 macroeconômicas fundamentais das economias latino-americanas.
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25 *Relevância do tema escolhido:* Devido ao seu aumento notável, as participações em caixa
26 tornaram-se uma característica fundamental do desempenho das empresas nas últimas décadas.
27 A necessidade de uma melhor compreensão é enfatizada pelo fato de que durante a maior parte
28 da última década, estas experimentaram uma fase de crescimento econômico acelerado e
29 mercados financeiros dinâmicos. O aumento resultante das oportunidades reais de investimento
30 ao longo desse período torna as participações em dinheiro mais difícil de explicar.
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34 *Impacto na área:* Não há outro estudo abordando esta questão de forma direta.
35 Documentamos fatos convincentes do aumento das participações em dinheiro para empresas
36 latino-americanas. Avaliamos as explicações tradicionais e decidimos qual é a mais adequada à
37 nossa amostra. Construímos e avaliamos empiricamente uma explicação complementar
38 relacionada à exposição ao ER e às variáveis macroeconômicas.
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42 *Metodologia:* Para abordar potenciais fontes de endogeneidade, utilizamos métodos de
43 dados de painel dinâmico. Em particular, aplicamos o Método Generalizado dos Momentos
44 proposto por Blundell e Bond (1998).
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I. Introduction

We document an increasing trend for corporate cash holdings in a sample of firms from selected Latin American countries since 2000. This increase occurred at a steady pace all through the decade and spread similarly across different countries, firm size segments and industries. It was also part and parcel of a fairly noticeable shift in the region's corporate balance sheet structure, at least for the large, listed firms.

The need for a better understanding of this corporate cash holdings increase is stressed by the fact that during most of the last decade, the region went through a phase of accelerated economic growth and buoyant financial markets, in the midst of the upward phase of the commodities export prices and foreign capital inflows cycle. The resulting surge in real investment opportunities along that period makes the growing cash holdings all the more puzzling. However, as far as we know, no academic study exists that documents and addresses this issue.

The growing amount of cash held by Latin American firms mirrors a similar performance by advanced economies' corporates over the last 30 years. Furthermore, it reproduces the foreign reserve accumulation carried out by central banks in most emerging economies during the past decade. Although substantial media and academic attention has been devoted to both growing cash holdings in developed countries (Bates, Kahle, & Stulz, 2009, Pinkowitz & Williamson, 2001, Pinkowitz, Stulz, & Williamson, 2016) and the foreign reserve accumulation by central banks (see, for instance, Mohanty & Turner, 2006), the recent increase in cash holdings by Latin American firms has been mostly overlooked by scholars.

In that context, the main purpose of this article is to assess the evolution of cash holdings in Latin American firms, and to shed light on its determinants. As we show below, several rationales are advanced to explain the increase in cash holdings in firms from advanced economies. Therefore, one of our specific goals is to discuss the validity of two broad strands of

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3 the literature for explaining the observed cash holdings trends in Latin America, namely: the
4 trade-off theory and the pecking order theory.
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7 In addition, there are reasons for considering that those factors have a secondary impact on
8 cash in Latin America. Significantly, Latin American firms face a riskier macroeconomic
9 environment which may exceed the effects of idiosyncratic causes. Therefore, a second
10 specific purpose is to discuss the importance of macroeconomic factors as explanatory
11 variables. In particular, we seek to evaluate the impact of exchange rate exposure, the balance of
12 payment result and economic growth as a motives for holding cash.
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19 We begin by providing evidence of the increase of cash holdings in a sample of large,
20 publicly traded, non-financial firms operating in the region. We show that this pattern is
21 pervasive and holds for firms from different countries and sectors, but is stronger in Brazilian
22 and Chilean firms.
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27 We then discuss whether the trade-off or the pecking order theory prevail when accounting
28 for the increase in cash holdings of Latin American firms.
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31 On that basis, we further investigate whether factors *a priori* affecting firms from emerging
32 markets play a relevant role in explaining firm cash holdings. These factors are exchange rate
33 exposure and key macroeconomic variables such as exchange rate fluctuations, balance of
34 payment result and GDP growth. In effect, our empirical results argue in favor of the relevance
35 of macroeconomic factors when explaining the increase in cash holdings in Latin American
36 firms.
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43 The rest of the paper is organized as follows. The next section presents the facts regarding
44 the cash holdings increase in our sample. It also delves into other balance sheet changes
45 occurred during the last decade such as the net deleveraging process, the reduction of short term
46 debt and the weakness of corporate capital expenditures. Section III, provides a review of the
47 theoretical explanations for holding cash available in the literature for firms from advanced
48 economies, and puts forward an hypothesis regarding the effects of exchange rate exposure over
49 cash accumulation in emerging countries. Section IV delves into the dataset construction and
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methodological issues. Econometric results are presented and discussed in section V. Finally, in section VI we summarize and discuss our main findings.

II. Cash holdings increase in Latin American firms

How did cash ratios evolved for Latin American firms over the last decade and a half? Figure 1 displays the quarterly evolution of the median cash-to-assets ratio over the period IV-2000/IV-2014, for a sample of publicly traded firms from five large Latin American countries: Argentina, Brazil, Chile, Mexico and Peru. A full-sample median is also included.

We find that cash ratios (defined as the ratio of cash and equivalents to total assets) increased steadily over most of the sample period, growing threefold until 2011 for the whole sample of firms (from 2,5% to 7,3% of total assets). Since then on, cash holdings decreased slightly, or remained constant through the end of the period analyzed. Brazilian and Chilean firms showed the larger increase, climbing almost fourfold, from 2.6% in 2002 up to 9,5% in 2010, and from 1,2% to 4,9%, respectively. For the rest of the countries, cash ratios experienced a steady but slower rise until 2010. By the end of the period, Brazilian firms stand as those holding the largest cash ratios of the sample, hovering around 9% of total assets.

Figure 1

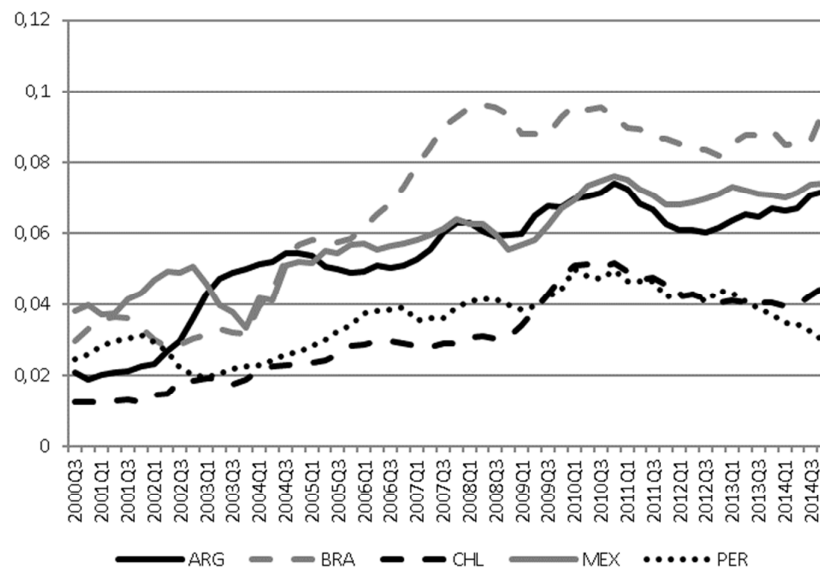
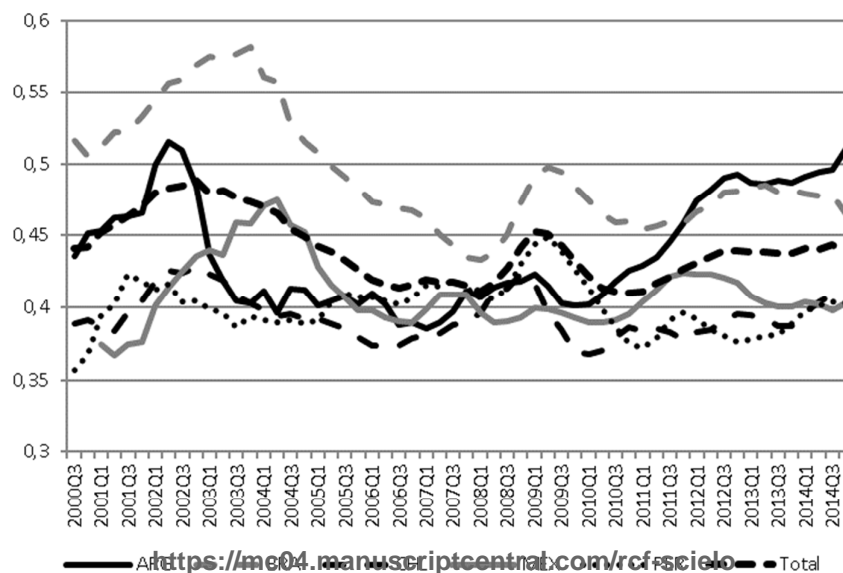


Figure 1. Median cash to assets ratio. This figure shows the median cash to assets ratio for firms from each of the five countries included in our sample: Argentina (ARG), Brazil (BRA), Chile (CHL), Mexico (MEX) and Peru (PER).

By the same token, the balance-sheet structure underwent analogous changes. Following Bates et al. (2009), we convey the broad implications of cash ratios for the financial structure of the firms analyzed by computing the net leverage ratio. We measure leverage as the ratio of total debt to total assets, and net leverage as leverage minus the cash-to-assets ratio. Whereas no clear-cut trend emerges when considering the leverage ratios, net leverage shows a fairly declining trend over the whole period mainly due to the increase in corporate cash holdings.

Figure 2



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Figure 2. Median Net Leverage Ratio. This figure displays the quarterly evolution of the median net leverage ratio for firms from each of the five countries included in our sample: Argentina (ARG), Brazil (BRA), Chile (CHL), Mexico (MEX) and Peru (PER). The Net Leverage measured as the ratio of Total Liabilities minus Cash to Total Assets.

Furthermore, this net deleveraging process goes along with a noticeable contraction of the short term debt ratio (ratio of current liabilities to total assets), at an average pace of 1.2 percentage points (pp) a year.

These findings concerning corporate debt dynamics may seem bewildering given that they occur in the midst of an international capital markets bonanza which should have pushed upwards the region's private sector indebtedness. However, they are consistent with previous research that finds that, rather than increasing their leverage so as to further finance private investment, Latin American firms took advantage of the favorable financial conditions by increasing their average maturity of debt (Didier & Schmukler, 2014), and smoothing its amortization profile (Bastos et al., 2015).

Moreover, the cash holdings buildup accompanies a somewhat disappointing performance of corporate investment in the region over the last decade. In fact, Manuelito & Jiménez, 2012 and (International Monetary Fund, 2015) claim that in the light of several indicators (investment

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3 dynamism in other peripheral regions, improvements in demand and profitability, and larger
4 private savings) private investment in Latin America fell behind expectations. By the same
5 token, (Pérez Artica, Delbianco, & Brufman, 2017) document a growing pattern of corporate net
6 lending, mostly driven by corporate investment weakness.
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10 11 12 13 **III. A review of the literature on cash holdings in advanced and** 14 **emerging countries**

15 16 17 **a. The literature on corporate cash holdings in advanced countries**

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19 What are the causes driving the cash holdings increase in Latin American firms? Drawing
20 on the literature of corporate cash holdings in advanced economies, in this section we outline a
21 preliminary set of determinants driving the cash holdings buildup in our sample. We classify
22 this literature according to whether theories consider the possibility of attaining optimal levels
23 of cash, or instead see cash ratios as a residual outcome of the firm's financial function. One of
24 the purposes of our empirical study will be to discuss whether one of these two competing
25 approaches prevails.
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33 34 35 *a) Trade-off theory and cash holdings.*

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37 Trade-off theory posits that firms chose optimal cash holdings that maximizes firm value.
38 We can split this approach between two of the motives for demanding cash, namely, the
39 *transaction* and *precautionary* motives. We discuss both motives below.
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44 *The transaction motive.* Provided that external financing is secured for a given firm, it may
45 still incur transaction costs when collecting cash, whether through debt or equity issues, or else
46 by converting noncash assets into cash. Firms will thereby hold a cash ratio that minimizes the
47 sum of two types of costs: on the one hand, the opportunity cost involved in holding non-
48 profitable liquid assets; on the other, the transaction costs associated to each operation by which
49 firms obtain cash. Classical studies in finance have modeled this motive (Baumol, 1952, Miller
50 & Orr, 1966).
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3 Several factors operate determining the optimal level of cash demanded because of this
4 motive. First, the transaction costs of external finance will be higher for firms that have never
5 accessed public markets or credit lines from the banking system. Consequently, cash ratios
6 should be lower for firms with higher, better debt rating or credit lines. Furthermore, liquidity
7 may be secured by selling off noncash assets, but this can only be attained at a discount.
8 Therefore, firms with mostly firm-specific operating assets may be encouraged to hold higher
9 levels of liquid assets (Opler, Pinkowitz, Stulz, & Williamson, 1999; Bates et al., 2009).
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17 Second, following Miller & Orr (1966) , managing cash holdings may entail considerable
18 economies of scale. As a result, larger firms are expected to hold lower cash ratios. More recent
19 literature focuses in the existence of economies of scale reducing the need for cash when firm
20 size increases. This has been documented, for instance, in Mulligan (1997) or Natke & Falls
21 (2010).
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29 *Precautionary motive.* When access to external financing is impaired, firms may hold cash
30 in order to hedge against financial constraints preventing the completion of investment
31 opportunities.
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36 A number of scholars have addressed the role of liquidity holdings, cash flows, and capital
37 structure management in order to moderate the effects of financial constraints over firm
38 investment. Unable to obtain external finance, constrained firms show a cash flow sensitivity of
39 investment, in the sense that a positive relation emerges between a firm's cash flow and its
40 capital expenditures (Ağca & Mozumdar, 2017; Fazzari, Hubbard, & Petersen, 1988; Stein,
41 2003)
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48 Holmström & Tirole (2000) show that, faced to the risk of unforeseeable liquidity
49 requirements, constrained firms will demand a positive amount of cash. Important contributions
50 have documented a propensity of constrained firms to save cash out of cash flows, while
51 unconstrained firms cash holdings show no systematical relation to cash flows (Acharya,
52 Almeida, & Campello, 2007; Almeida, Campello, & Weisbach, 2004)
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3 A variety of factors determine the level of precautionary cash demand in presence of
4 financial constraints. Firstly, Opler et al. (1999) show that corporate demand for cash falls when
5 access to credit and financial leverage improves. Firms with higher firm-size and payout ratios
6 are typically considered less financially constrained (for a discussion of these and other financial
7 constraints measures, see Whited & Wu, 2006).

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13 Second, the cash ratio increases for constrained firms with better and more profitable
14 investment opportunities (as measured by return on assets, cash flows or market-to-book ratios),
15 which act as proxies for financial distress costs (Bates et al., 2009).

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20 Third, higher volatility of the operating environment and cash flow. Many studies provide
21 evidence that cash ratios are determined by cash flow and other operating variables' volatility.
22 In effect, idiosyncratic volatility impacted positively on cash ratios of US, German and French
23 firms (Baum, Caglayan, & Talavera, 2008; Baum, Schäfer, & Talavera, 2007) . Moreover, it has
24 been shown that idiosyncratic volatility went through a protracted upward trend since the 1960s,
25 mainly driven by the increase in volatility of fundamental variables like cash flow, net sales and
26 profitability (Irvine & Pontiff, 2009). Crucially, macroeconomic volatility has been shown to
27 affect firm demand for cash in advanced countries (Baum, Caglayan, Ozkan, & Talavera, 2006),
28 as well as in developing countries like Argentina, Mexico and Turkey (Demir, 2009).

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39 *b) The pecking order theory*

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41 We now consider the hypothesis that firms do not pursue an optimal level of cash, but
42 instead this fluctuates as a result of their financial inflows and payments. Myers (1984) sketches
43 a financial hierarchy typically followed by firms in order to meet their liquidity needs,
44 sequentially moving from one source to the following when financing provided by the first is
45 depleted: (i) retained earnings; (ii) safe-debt issues, (iii) risky-debt issues, and (iv) stock issues.

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52 Two alternative rationalizations of the financial hierarchy are found in the literature. First,
53 it may arise from an agency problem, with managers trying to avoid the financial discipline
54 imposed to them by investors and creditors (Dittmar & Mahrt-Smith, 2007; Jensen, 1986).

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3 Second, it may be an optimal response to information asymmetries pushing external financing
4 costs upwards.
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7 A classical model based on this last rationale is offered by Myers & Majluf (1984).
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9 Information asymmetries may lead to substantial increases in the cost of equity, leading firms to
10 avoid issuing it. Consequently, if cash flows are high enough to invest in profitable investment
11 opportunities available and repay debt becoming due, firms accumulate the remaining cash
12 flows in the form of liquid assets. Henceforth, information problems explain the existence of a
13 hierarchy and, thereby, the idea of cash holdings as a byproduct of this financial behavior.
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17 If that is the case, the cash ratio becomes a residual outcome of two opposite financial
18 flows: the firm's cash flow, on the one hand, and its applications, investment requirements and
19 debt disbursements, on the other. Whenever the firm receives cash flows superseding the level
20 of investment and debt payments, cash will be stockpiled. If the opposite is true, cash ratios will
21 be reduced as the firm's payments will be met by using previously accumulated cash.
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25 One logical consequence of this is that cash dividend payments will decrease cash
26 holdings. However, more recent studies claim that payout ratios will grow when the cash flow
27 increases exceeding the current and expected liquidity requirements (Benavides, Berggrun, &
28 Perafan, 2016). Therefore, in presence of substantially high cash flows, cash holdings and
29 dividends may both increase at a time.
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33 Summing up, if the pecking order theory explains the cash holdings evolution of Latin
34 American firms, we should expect a positive relation of cash flows, and a negative effect of
35 capital expenditures and debt repayments. Regarding dividend payments, they may relate
36 positively or negatively with cash.
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40 One of the purposes of our article is to assess whether one this two broad explanations
41 prevails when accounting for the increase in Latin American firms cash. Deciding between
42 trade-off and pecking order theory on an empirical basis should focus on their opposite
43 predictions. e will assess the preeminence of one theory over the other on the basis of three
44 variables: capital expenditures, firm size, and dividends payout ratio.
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3 Trade-off theories hypothesize that (i) firms with more capital expenditures should
4 accumulate more cash to prevent financial constraints, (ii) larger firms should exhibit lower cash
5 ratios, because of economies of scale and more pledgeable assets at hand; and (iii) firms paying
6 dividends are less financially constrained and should hold less cash.
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11 In contrast, according to the pecking order theory: (i) firms with more capital expenditures
12 should accumulate less cash, (ii) larger firms presumably have been more successful, and hence
13 should have more cash after controlling for investment (Opler et al., 1999), and (iii) firms
14 paying dividends may demand either less cash holdings, or more cash holdings in presence of
15 high cash flows.
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20 21 22 23 *Some preliminary evidence in Latin American firms*

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25 A first hint as to the actual impact of some of these determinants of cash holdings in our
26 sample may be grasped by tracking the evolution of the cash ratios of firms in different
27 segments or groups within our sample. To begin with, we assess whether firm size played a
28 relevant part in shaping the average increase in the cash ratio, by dividing the sample firms into
29 quintiles of size on the basis of the book value of assets averaged over the sample period.
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36 Figure 3 shows the median cash ratio for the firm size quintiles over the period covered in
37 the sample. In the light of the optimal cash ratios theories discussed above, Figure 3 conveys a
38 rather counterintuitive pattern, with the larger size quintile cash ratio showing a considerably
39 sharper increase until the end of 2009, and the smaller size quintile displaying the weakest
40 growth. This counters the notion of economies of scale and the role played by pledgeable assets
41 as a covenant easing credit access for financially constrained firms. Instead, the size distribution
42 of the cash ratio increase seems consistent with the pecking order theory.
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50 Similarly, the effect of operating volatility can be roughly evaluated by considering the
51 evolution of cash holdings for firms in different segments volatility quintiles. As a measure of
52 operating volatility we compute the coefficient of variation of the net cash flow from operating
53 activities for each firm. Figure 4 exhibits the median cash ratio for each quintile of operating
54 volatility. At first sight, similar to firm size, volatility seems to perform a role opposite from
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expected according to optimal cash ratio theories. The less volatile firms exhibit the larger increase, and a clear-cut negative relation between volatility and cash accumulation surfaces.

Nevertheless, the econometric results presented in Section V, where this relation is controlled for other determinants, suggests this raw-data approach might result misleading, as the coefficient on size turns out negative or non-significant and the coefficients for volatility become positive and statistically significant.

Figure 3

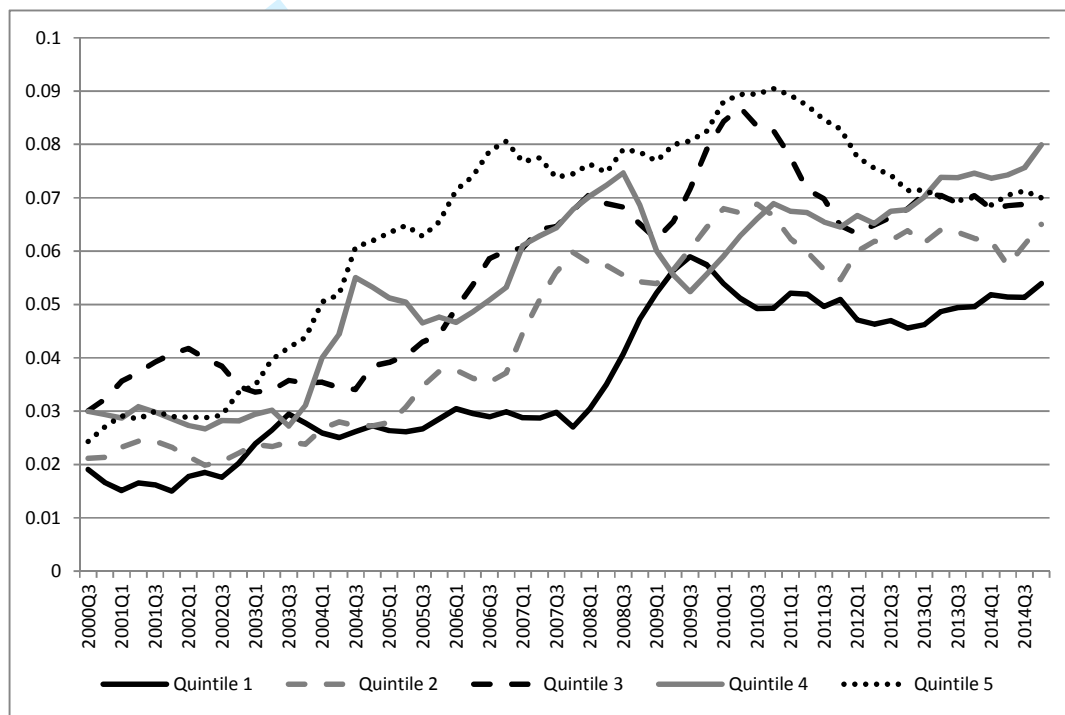


Figure 3 displays the evolution of the median cash-to-assets ratio for each firm size quintile in the sample.

On the other hand, an important insight arises when we consider the role played by the net cash flow. Figure 4 illustrates how the cash ratio evolved for each sample quintile of net cash flow normalized by total assets. It points to a significantly larger upsurge in the cash ratio of firms in the quintiles receiving the higher net cash flows. We can therefore infer that firms with the most profitable investment opportunities are urged to stockpiling larger amounts of liquidity as an internal source of finance. In the same vein, this positive relation between net cash flows and cash ratios seems to confirm the pecking order theory.

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Figure 4

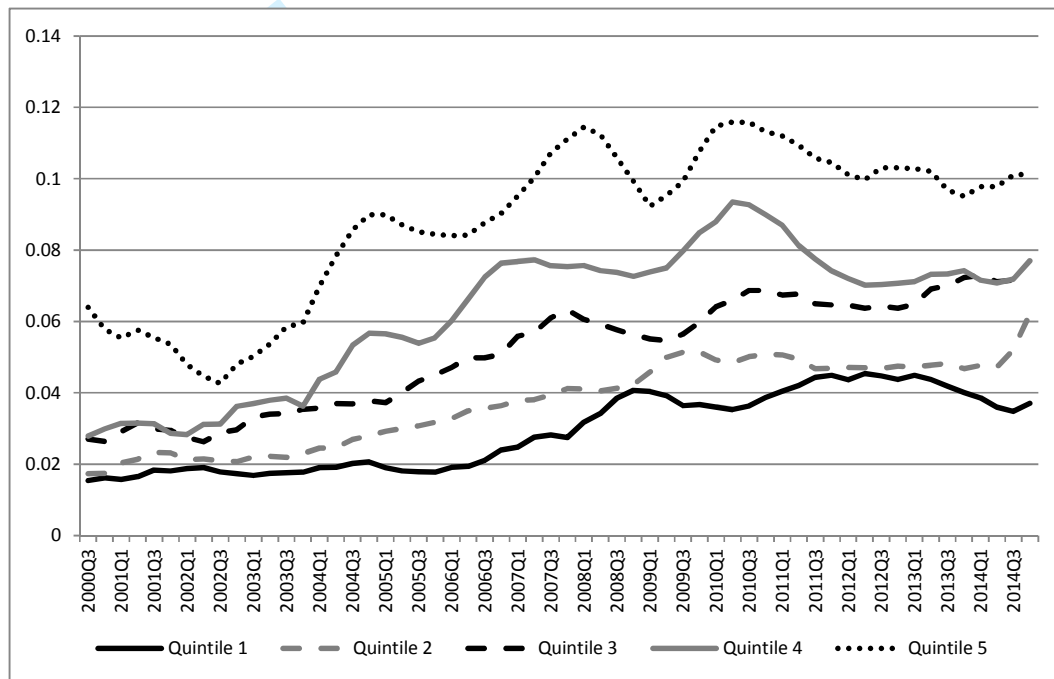


Figure 4 shows the median of the cash ratio for firms from each quintile of cash flow in the sample, as measured by the ratio of Net Cash Flow from operating activities to Total Assets.

A preliminary insight as to the way access to external finance affects the cash demand is offered in Figure 5, where we show the median cash ratio for each quintile of leverage. The largest increase in cash holdings occurred in the least indebted quintile, while firms in the fifth quintile drove a milder cash accumulation. This is consistent with the expected effect of leverage over transaction costs of accessing external finance, and the need for more internal finance accumulation experienced by less leveraged and more financially constrained firms.

Figure 5

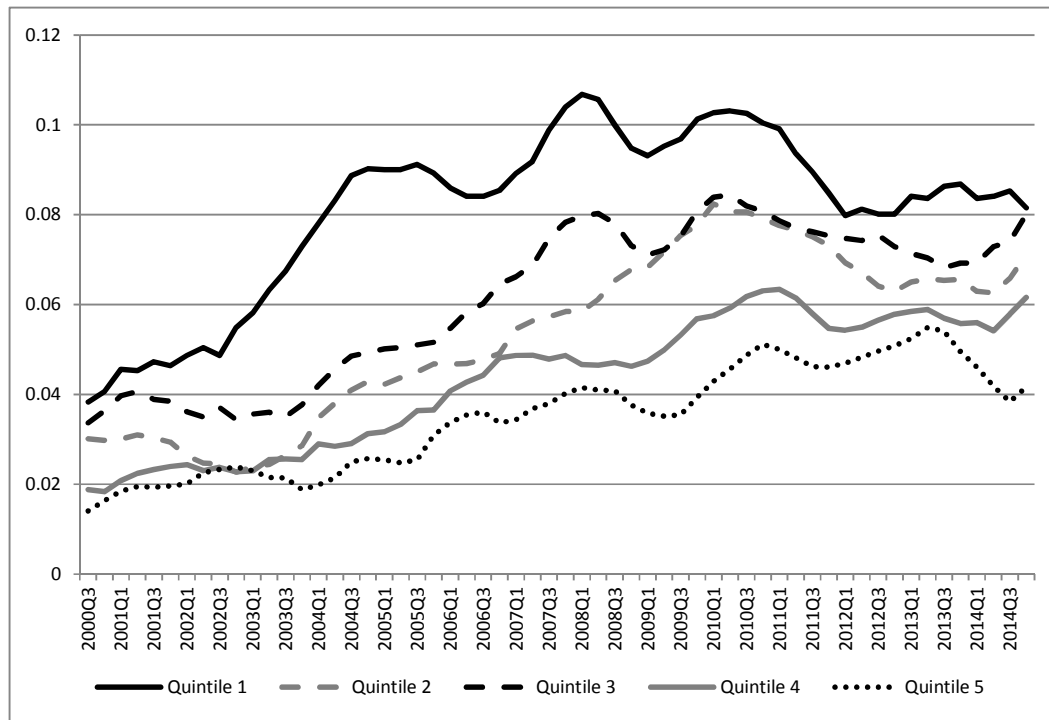


Figure 5 shows the median cash-to-assets ratio for firms in each quintile of Leverage. Leverage is measured as the ratio of Total Liabilities to Total Assets.

b. Specific determinants in emerging markets: the foreign exchange exposure and macroeconomic variables

Corporate cash holdings of Latin American firms have been barely dealt with by the corporate finance literature. When addressed, the issue is taken as a byproduct of financial constraints (Panigo, Elosegui, & Blanco, 2007). However, when considering the determinants of cash holdings of firms operating in emerging market economies, the exchange rate exposure and key macroeconomic indicators *a priori* might play a relevant role

Exchange rate exposure. When operating in emerging economies, firms are compelled to use a local currency prone to depreciation, thereby jeopardizing their financial health. Indeed, contrary to what is found for developed economies (Guay & Kothari, 2003) when a depreciation occurs, firms from emerging countries face negative effects (Galindo, Panizza, & Schiantarelli, 2003 Júnior, 2011)

When assessing the determinants of currency risk management, Schiozer & Saito (2009) find that the main determinant of financial risk for firms from Latin America is the cost of

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3 financial distress associated to balance sheet currency mismatch. That is, holding liabilities
4 denominated in foreign currency and assets denominated in local currency. Importantly, Chui,
5 Kuruc, & Turner (2016) show that this kind of currency mismatches have been on the rise in
6 Latin American firms over our sample period. However, when firms are able to use operational
7 hedges their currency exposure falls (Schiozer & Saito, 2009). For instance, an exporting firm
8 whose revenue is denominated in foreign currency will face less currency risk.
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Scholars typically measure the exchange rate exposure as the sensitivity of firm market value to foreign exchange variations (for a survey, see Muller & Verschoor, 2006). However, in order to take into account the operational hedging mentioned above, we apply a more direct approach at the exchange rate fluctuations' impacts over firms' financial management, and cash accumulation.

We distinguish two kinds of risks arising from exchange rate fluctuations: (1) the impact of ER over firms' operating cash flows; and (2) the impact of ER on the firms' balance sheet. The domestic currency-denominated cash flow may increase or decrease with a currency depreciation. There are two typical cases. Following a depreciation, exporting firms, for instance, may experience an increase in their domestic currency-denominated cash flow. Instead, firms from non-tradable sectors may see their costs increase faster than their revenue, hence facing a contraction in their cash flow.

Second, depreciations increase the burden of foreign currency-denominated debt in presence of currency mismatch, and thus may lead the firm to a costly financial distress. Financial disbursements such as interest and principal repayment of dollar denominated debt will escalate in domestic currency terms, whereas the value of assets may fall behind.

The currency risks may lead firms to increase cash holdings as a hedging strategy when other hedging instruments are not available. Particularly when denominated in foreign currency, cash holdings may do away with or help mitigate the currency risk.

Summing up, two sources of exchange rate exposition can be identified, which can also be separately measured and whose impact on cash holdings can be investigated. Namely, the

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3 operating exposure, measuring the sensibility of operating profits or cash flows to ER; and the
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5 balance-sheet exposure, which accounts for the sensibility of financial leverage to ER.
6
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8
9 *Macroeconomic variables.* On the other hand, differences in the macroeconomic context
10
11 may exert additional impacts over firm propensity to hold cash. In particular, a surplus balance
12
13 of payments may lead firms to lower cash holdings given that it reduces the need to hedge
14
15 against ER depreciation, and instead introduces expectations of domestic currency appreciation.
16
17 Médici & Panigo (2015) show that, for countries facing balance of payments constraints,
18
19 persistent net commercial surpluses and capital inflows would ease foreign currency restraints
20
21 thereby spurring economic growth. This, in turn, should boost investment opportunities
22
23 affecting the demand for cash. On the contrary, persistent balance of payments deficits stimulate
24
25 ER depreciation expectations, and thus spur firms to hedge against its damaging effects over
26
27 firm performance.
28

29
30 Additionally, as discussed (Baum et al., 2006) macroeconomic variables such as GDP
31
32 growth should capture the aggregate fluctuations of investment opportunities. Additionally, the
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34 interest rate would proxy for the private cost of funds and thus affect the firm-level opportunity
35
36 cost of holding cash.
37

38
39 In sum, we expect firms exposure to ER, ER depreciations and the country's balance of
40
41 payment result to be non-negligible determinants of the cash holdings of Latin American firms.
42
43 ER and ER exposure should have positive effects, while the third should impact negatively.
44
45 Besides, as long as it represents aggregate investment opportunities, we expect GDP growth to
46
47 produce higher cash holdings if the trade-off model prevails. Interest rates should affect
48
49 negatively the level of cash, for they increase its opportunity cost.
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51
52 *Development banking.* Given that the literature finds particularly strong causal effects of
53
54 financial variables on cash holdings, we should pay attention to one main source of asymmetries
55
56 in access to finance across Latin American countries: the presence of one of the largest
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58 development banks in the world, the BNADES, operating in Brazil. Development banks are
59
60 supposed to specialize in long term lending, to promote new industries and firms (Ferraz, Além,

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3 & Madeira, 2013). Although there is ambiguous evidence of its effectiveness (Lazzarini,
4 Musacchio, Bandeira-de-Mello, & Marcon, 2014), it is important to control our results for this
5 fact given that Brazilian firms will presumably benefit from relatively easier and subsidized
6 access to finance. We thus expect financial constraints to have weaker effects on firms from
7 Brazil.
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9

10 11 12 13 **IV. Data and Methodology**

14
15 In order to investigate whether the theoretical determinants of cash holdings discussed
16 above provide a suitable explanation for the cash holdings patterns observed in firms from Latin
17 America, we perform an econometric analysis. In this section we describe the database used,
18 and present the baseline and extended models considered. Besides, we describe the construction
19 of the main variables and discuss the main econometrical issues.
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23 Our sample is built based on quarterly, firm-level data, from the Compustat Global
24 Fundamentals Database. As already mentioned, we restrict our sample to only five large Latin
25 American countries for which a sufficient number of individual firms report fundamentals data,
26 namely: Argentina, Brazil, Chile, Mexico and Peru. The sample period is 2000Q1-2014-Q4. We
27 exclude financial and insurance companies (SIC Codes 6000 to 6999).
28
29

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31 We also include macroeconomic variables from the International Monetary Fund's
32 International Financial Statistics (IFS-IMF).
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35
36 *The model.* The dependent variable is defined as the cash-to-assets ratio. First, we evaluate
37 a baseline model regressing the cash ratio on a set of independent variables intended to capture
38 the effects of the transaction and precautionary motives, and the pecking order theory. This
39 allows us to evaluate whether the trade-off or the pecking order theory hold in our sample.
40 Subsequently, we consider an extended model, adding two variables that reflect the impact of
41 exchange rate exposure, and a set of macroeconomic variables. In what follows, we describe the
42 explanatory variables in detail and the econometric issues.
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46 - *Size.* Following the literature (Bates et al., 2009), we measure firm size as the
47 natural logarithm of the book value of total assets. We expect the coefficient of firm size to
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3 be negative if firms pursue an optimal level of cash. Instead, we expect the size coefficient
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5 to be positive if the pecking order theory holds true.

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7 - *Net Cash Flow*. This is represented by the cash flow from operating activities
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9 divided by the book value of total assets. According to both theories, this coefficient is
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11 expected to be positive.

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13 - *Dividends to assets*. We construct this measure as the ratio of cash dividends
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15 paid to total assets. We expect the coefficient to be negative if the precautionary motive
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17 holds, since firms with higher payouts may reduce the distribution of dividends when
18
19 investment opportunities arise and external finance is not available (Fazzari et al., 1988).
20
21 Likewise, as discussed above the pecking order theory does not predict a particular sign of
22
23 the coefficient.

24
25 - *Gross Capital Expenditures*. Capital formation is measured by the capital
26
27 expenditures divided by the book value of total assets. According to the trade-off theory, we
28
29 expect the coefficient on capital expenditures to be positive, given that more investment
30
31 opportunities lead firms to accumulate more cash, as a hedging strategy against financial
32
33 constraints. Pecking order theory would predict a negative coefficient.

34
35 - *Sales growth*. Another measure of investment and corporate growth
36
37 opportunities is provided by the firm sales growth rate. We compute this as the first
38
39 difference of net sales, divided by the net sales level. If higher investment opportunities
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41 were to increase the demand for cash, this coefficient ought to be positive.

42
43 - *Net working capital*. Net working capital amounts to current assets like
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45 inventories and short term accounts receivable. These are supposed to serve as substitutes
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47 for cash, and hence are expected to have a negative coefficient (Bates et al., 2009; Opler et
48
49 al., 1999).

50
51 - *Leverage*. As explained above, leverage is measured as the ratio of the book
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53 value of total liabilities to total assets. Given this is a measure of the extent to which firms
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55 access credit and debt markets, we expect this coefficient to be negative, reflecting a lower
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57 need to hedge against financial constraints.
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3 - *Short-term leverage.* We include a specific variable accounting for the short
4 term leverage, to differentiate the effects of overall indebtedness and debt coming due in the
5 short term. This should generate cash requirements in the short term, and thus increase cash
6 ratios. We compute this as the ratio between current liabilities and total assets.
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10 - *Non-operating assets.* As discussed above, firm-specific assets are expected to
11 correlate positively with cash holdings, since diversified firms can rely on selling off non-
12 core assets at a lower discount in order to secure liquidity. We capture this idea by
13 measuring the proportion of total assets represented by assets other than operating ones.
14 Non-operating assets are defined as those non-current assets other than fixed assets. We
15 normalize it by the book value of total assets, and expect its coefficient to be negative.
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19 - *Sales volatility.* We measure volatility of the operating environment by
20 computing a 5-quarter rolling coefficient of variation of the firm's net sales. We expect this
21 coefficient to be positive, given that higher volatility increases hedging needs.
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24 - *Exchange rate operative exposure.* We aim to measure the degree to which a
25 firm is exposed to foreign exchange depreciations. As discussed above, we identify two
26 different channels for this. First, through an impact of depreciations on firms' operating
27 cash flow. Second, by an impact on its balance sheet.
28

29 We measure a firm's operating exposition to ER by computing the correlation between its
30 cash flow from operations and the corresponding country ER. ER is measured as a dollar
31 price in national currency terms, so a depreciation is capture by an increase in ER. Equation
32 1 shows how we compute this correlation.
33
34

$$ER\ Operative\ Exposure_i = corr(ncf\ operations_{it}, ER) \quad [Eq.1]$$

35
36 For a given firm, we interpret a negative correlation between these variables as showing a
37 negative impact of depreciations on its operating performance. This should lead the firm to
38 increase the demand of cash in case it faces unpredicted liquidity requirements. Likewise,
39 we interprete a positive correlation as showing a positive impact of depreciations on its
40 operating performance. This should reduce the hedging need for cash. Thus, we expect the
41 ER operative exposure to have a negative coefficient.
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- *Balance Sheet ER Exposure.* Likewise, the effect of foreign exchange depreciation on firm balance sheet is grasped by computing a Pearson correlation coefficient between the country's foreign exchange and each firm's leverage ratio.

$$ER \text{ Balance Sheet Exposure}_i = \text{corr}(\text{leverage}_{it}, ER) \quad [\text{Eq. 2}]$$

Firms with positive and high correlation coefficient are supposed to be negatively exposed to depreciations, and should experiment more need for cash or other liquid assets as a hedging instrument. Firms with lower correlation coefficient, on the contrary, have balance sheets less vulnerable to ER depreciations, and thus will need less cash. Consequently, we expect the regression coefficient of our ER Balance Sheet exposure measure to be positive.

- *Macroeconomic effects.* We aim to capture and control for the aforementioned effects of macroeconomic forces adding to our model four macroeconomic variables: *foreign exchange depreciation rate, the balance of payment surplus (deficit) as a percentage of GDP, GDP growth rate, and the active interest rate.* We obtain these four variables, on a quarterly basis, from the International Financial Statistics Database and Balance of Payments Database of the International Monetary Fund.

We test the stationarity of these macroeconomic variables using the panel unit-root test of Levin, Lin, & Chu (2002). The results show that all four series are stationary around a deterministic trend.

Table 1
Levin-Lin-Chu unit-root test for macroeconomic variables

	GDP	ER	BOP	Interest Rate
Unadjusted t	-6.6169	-19.0543	-14.4664	-10.2793
Adjusted t*	-3.4801	-18.6085	-11.6946	-5.9446
P-Value	0.0003	0.0000	0.0000	0.0000

Table 1 displays the t statistic and P-Value of the Levin, Lin & Chu (2002) panel unit-root test for each of the macroeconomic variables included in our extended model. The test specification includes panel means, a time deterministic trend and cross-sectional means are removed. The ADF regressions lags structure is chosen by a Akaike Information Criterion.

Interaction terms for Brazilian firms. The easing of credit availability produced by development banks should relax the effects of credits constraints over Brazilian firms, which may access subsidized, long-term credit from BNADES. We include two interaction terms to capture this effect. First, one between a dummy for Brazilian firms and the logarithm of Total Assets. Given that financial constraints are negatively related to size, and Brazilian firms are supposed to face less constraints, we expect the sign of this coefficient to be positive. Second, we introduce an interaction term between a dummy for Brazilian firms and the leverage. We expect this coefficient to have a positive signs, showing that the negative relation between leverage and cash is weakened in the case of Brazilian firms.

The econometric specification. To analyze the extent to which classical theories allow us to comprehend the recent evolution of cash holdings in Latin American firms, we first estimate a baseline model defined by Equation 3:

$$\begin{aligned} \text{Cash Ratio}_{it} = & \beta_0 + \beta_1 \text{Size}_{it} + \beta_2 \text{Net Cash Flow}_{it} + \beta_3 \text{Dividends}_{it} + \\ & \beta_4 \text{Capital Expenditures}_{it} + \beta_5 \text{Sales Growth}_{it} + \beta_6 \text{Net Working Capital}_{it} + \\ & \beta_7 \text{Leverage}_{it} + \beta_8 \text{ShortTerm Debt}_{it} + \beta_9 \text{NonOperative Assets}_{it} + \\ & \beta_{10} \text{Net Sales Volatility}_{it} + \beta_{10} \text{Cash Ratio}_{it-1} + u_i + e_{it} \end{aligned} \quad [\text{Eq. 3}]$$

Where u_i represents firm i unobserved characteristics, and e_{it} is an independent and identically distributed error term for each firm i and period t .

Some sources of endogeneity may affect the OLS estimators. Barros & Silveira (2008) provide a review of simultaneous relations between some of the variables included in Equation 3. There might be, for instance, a simultaneous relation between financial leverage and investment opportunities, such as those captured by capital expenditures and sales growth. Additionally, the capital structure of a firm may influence its payout policy (Fama & French, 2002)

To address these sources of endogeneity, we add the lag of the dependent variable as a regressor, which makes the model dynamic in nature, and estimate Equations 3 and 4 using the Generalized Moments Method proposed by Blundell & Bond (1998)), also known as system-GMM method. This method is suitable for dynamic models with unobserved heterogeneity and endogeneity. It combines the difference-GMM approach (which applies lagged independent variables as instruments in the levels equations to address endogeneity) with the original

equations in levels. This procedure increases the efficiency of the estimators when the series are very persistent. Therefore, their lagged levels are only weakly correlated with subsequent first-differences (Blundell & Bond, 1998). We apply Roodman's (2009) approach to avoid biased estimators resulting from too many instruments. This consists of restricting the lag depth to at most two instead of using all available lags for instruments.

In a subsequent step, we add to this equation the variables corresponding to the exchange rate exposure and macroeconomic effects.

$$\begin{aligned} \text{Cash Ratio}_{it} = & \beta_0 + \beta_1 \text{Size}_{it} + \beta_2 \text{Net Cash Flow}_{it} + \beta_3 \text{Dividends}_{it} + \\ & \beta_4 \text{Capital Expenditures}_{it} + \beta_5 \text{Sales Growth}_{it} + \beta_6 \text{Net Working Capital}_{it} + \\ & \beta_7 \text{Leverage}_{it} + \beta_8 \text{ShortTerm Debt}_{it} + \beta_9 \text{NonOperative Assets}_{it} + \\ & \beta_{10} \text{Net Sales Volatility}_{it} + \beta_{11} \text{Cash Ratio}_{it-1} + \beta_{12} \text{ER Operative Exposure} + \\ & \beta_{13} \text{ER Balance Sheet Exposure} + \beta_{14} \text{ER} + \beta_{15} \text{BOP} + \beta_{16} \text{GDP} + \beta_{17} \text{Interest Rate} + \\ & u_i + e_{it} \end{aligned} \quad [\text{Eq. 4}]$$

We use a Wald test for testing whether the new variables add enough precision to our estimates. Finally, we include interaction terms to highlight the role played by the Brazilian public development bank credits. These new variables capture the effect that financial constraints and capital structure variables of Equation 3 have on cash ratios, particularly for Brazilian firms.

V. Econometric Results

Table 1 displays the econometric results for Equations 3 and 4, and for an additional model including interaction terms for Brazilian firms. All three models pass the second-order serial correlation test. We cannot reject the null hypothesis that the error term is not serially correlated. Most p-values for the Hansen test satisfy the conventional significance levels with an average value of 0.747. The p-values for the difference-in-Hansen tests for the validity of the instruments are also acceptable. The validity of the subsets of instruments is established for all regressions.

The p-values of both Wald tests shown at the end of Columns B and C show that the variables included are jointly statistically significant and add valuable information to the regression. We conclude that the ER exposure and macroeconomic variables, on the one hand, and the interaction terms for Brazilian firms are relevant and worth including in our model.

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3 The coefficients of firm size, the payout ratio and the sales growth hold for all three models
4 and are consistent with the trade-off model. Larger firms and firms distributing more dividends
5 hold lower levels of cash, and firms with higher investment opportunities as signaled by sales
6 growth demand more cash. The net cash flow shows the expected positive sign as well.
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11 Balance sheet variables such as the aggregate and short-term leverage (except when
12 interaction terms for Brazil are included), the non-operating assets and net working capital also
13 seem to confirm predictions made in the trade-off theory. Firms with higher aggregate leverage
14 seem to face less constraints when requesting external finance, and thus need less hedging.
15 However, when more liabilities become due in the short term, firms hold more cash. Non-
16 operating assets and net working capital seem to act as substitutes of cash.
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23 Finally, the baseline model evaluation shows that more volatility in the operating
24 environment as capture by the sales volatility leads firms to hold more cash.
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27 Although capital expenditures reduce the amount of cash held by firms in our sample,
28 which tends to validate the pecking order theory, an overall interpretation of the results seems to
29 favor the trade-off model.
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33 Regarding the impact of ER exposure, we find the expected effect of operating exposure.
34 The negative coefficient means that firms whose cash flow fall when a depreciation occurs, tend
35 to hedge against this risk by demanding more cash.
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39 The balance sheet exposure, however, shows a statistically significant but opposite from
40 expected sign. That is, firms with balance sheets more vulnerable to ER depreciation tend to
41 demand less cash. This could be signaling a propensity to hedge against this specific risk by
42 using instruments other than cash (Schiozer & Saito, 2009). This result might also obey to the
43 fact that Latin American firms took advantage of the buoyant financial markets to extend the
44 average maturity of their debt (Schmukler & Didier, 2014), lowering the need for short term
45 liquidity.
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53 As regards the impact of macroeconomic factors, as expected, we find that economic
54 growth affected positively the demand for cash, which can obey to higher investment
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3 opportunities and cash flows derived from a higher economic activity environment. The ER also
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5 produced the expected result, with depreciations leading to higher cash holdings.
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7 The remaining two macroeconomic indicators only show the expected signs when we
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9 include the interaction terms for Brazilian firms. In this last model, interest rates reduce the
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11 demand for cash, as expected given that they represent part of its opportunity cost. And the
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13 balance of payments result also lowers cash, possibly reflecting less ER hedging needs.
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15 Finally, the positive signs of both interaction terms in Column C of Table 2, reveal that the
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17 financial constraints effects pushing firms to hold cash are less pervasive for Brazilian firms.
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Table 2
The determinants of cash holdings

INDEPENDENT VARIABLES	(A)	(B)	(C)
Log (Total Assets)	-0.00120*** (4.30e-05)	-0.000787*** (6.75e-05)	-0.000356*** (0.000108)
Net Cash Flow to Assets	0.151*** (0.000781)	0.147*** (0.00116)	0.148*** (0.00137)
Dividends to Assets	-0.189*** (0.00116)	-0.197*** (0.00158)	-0.197*** (0.00203)
Capital Formation Gross	-0.196*** (0.00138)	-0.196*** (0.00213)	-0.191*** (0.00196)
Sales Growth	0.0114*** (0.000262)	0.0107*** (0.000273)	0.0107*** (0.000257)
Net Working Capital	-0.0559*** (0.000748)	-0.0547*** (0.00108)	-0.0544*** (0.00140)
Leverage	0.0291*** (0.000978)	0.0190*** (0.00188)	-0.0147*** (0.00247)
Short Term Debt	0.0655*** (0.00200)	0.0663*** (0.00281)	0.0815*** (0.00266)
Non-operative assets	-0.0417*** (0.00121)	-0.0426*** (0.00131)	-0.0534*** (0.00152)
Moving CV Net Sales	0.00345*** (0.000223)	0.00374*** (0.000274)	0.00700*** (0.000526)
Operative FX Exposure		-0.0191*** (0.00125)	-0.0276*** (0.00134)
Balance Sheet FX Exposure		-0.0106*** (0.000475)	-0.0146*** (0.000576)
FX Depreciation		0.0104*** (0.000646)	0.0177*** (0.000744)
Balance of Payments		0.00309*** (0.00108)	-0.00344*** (0.000898)
Economic Growth		0.0198*** (0.000732)	0.0168*** (0.00103)
Active Interest Rate		0.000655***	-0.000540***
L.(Cash Ratio)	0.807*** (0.00139)	0.801*** (0.00113)	0.782*** (0.00212)
Brazil*Log (Total Assets)			0.00221*** (0.000273)
Brazil*Leverage			0.0118*** (0.00384)
Constant	0.0290*** (0.000289)	0.0268*** (0.000918)	0.0396*** (0.00131)
AR (1) p-value	0,0000	0,0000	0,0000
AR (2) p-value	0,621	0,631	0,64
Hansen Test p-value	0,652	0,722	0,826
Wald Test Chi-2		1919,99	1458,58
Wald Test P-Value		0,0000	0,0000
Observations	10,258	9,973	9,973
Number of id_company_code	595	595	595

Table 2 shows the econometric results of Equation 3, Equation 4 and an augmented version of Equation 4. Column A presents the results of the baseline model displayed in Equation 3. Column B shows the coefficients for Equation 4, and Column C, the results of a model where two interaction terms are added to Equation 4. This interaction terms consist of an indicator variable for Brazilian firms, multiplied by the logarithm of assets and the leverage ratio. We use the Blundell a& Bond (1998) estimator to address potential endogeneity issues arising from the inclusion of dividends payout ratio, the financial leverage ratio and short-term leverage as regressors. We limit the total number of lags to be used as instruments to at most 2. Standard error are shown in parenthesis, and significance levels are shown as follows: *** p<0.01, ** p<0.05, * p<0.1. P-values for AR (1), AR (2) tests of autocorrelation of the error term are included, as well as the Hansen test. Finally, in Columns B and C we show the Wald test for the joint significance of the variables added with respect to previous the column.

VI. Summary and Discussion

We document an increasing trend for cash holdings in non-financial firms from Latin America, at least since 2000. This increase proceeded steadily until 2010, when cash holdings stabilized at a significantly higher level, continued growing at a slower pace, or decreased slightly depending on the country. The increase in cash holdings comes as an intriguing fact, given that it occurred in the middle of an economic growth phase surrounded by booming international conditions as regards export prices and capital inflows to the region, presumably providing a broad array of investment opportunities.

We find strong evidence supporting the trade-off theory. This suggests that cash holdings were accumulated mainly for precautionary motives to hedge against potential financial constraints.

Additionally, Latin American firms seem to experience additional motives for holding cash related to currency risks. Specifically, we find that hedging against exchange rate risks affecting the operational cash flows is a statistically relevant motive. Our evidence does not confirm that hedging against balance sheet currency mismatch plays the expected role for demanding cash.

The macroeconomic environment exerts relevant effects on firms' demand for cash. Importantly, during our sample period aggregate economic growth seems to increase the demand for cash, as well as exchange rate depreciation.

Finally, the easing of financial conditions provoked by development banking credit in Brazil through BNADES, also seem to weaken the financial constraints motive for demanding cash in Brazilian firms.

The positive impact of balance of payments surplus on firms' cash holdings is a rather perplexing fact, given that we would have expected the opposite effect. However, a broader perspective shows that this behavior was also featured by the central banks of the region, mainly as a precautionary procedure against future drop-off in the foreign capital and commercial inflows. The specifics of this shared hedging strategy against a common macroeconomic risk remain unexplored and are part of our future research agenda.

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Why do Latin American firms hold so much more cash than they used to?

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Results and contributions of the article: We document an increasing trend for corporate cash holdings in a sample of selected Latin American firms between 2000 and 2014. Along the same lines, net leverage and short term debt show a declining trend over the same period. We find that the trade-off theory may account for this. We also find a substantial effect of macroeconomic variables particularly affecting firms operating in the region, such as exchange rate risks.

Purpose of the work: We intend to assess whether the trade-off or the pecking order theories explain the increase in cash ratios for Latin American firms. Additionally, we seek to test the explanatory power of additional variables capturing key macroeconomic features of Latin American economies.

Relevance of the chosen theme: Because of its noticeable increase, cash became a key feature of Latin American firm performance in the last decades. The need for a better understanding is stressed by the fact that during most of the last decade, these experienced a phase of accelerated economic growth and buoyant financial markets. The resulting surge in real investment opportunities along that period makes the growing cash holdings all the more puzzling.

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Impact on the area: As far as we are concerned, there is no other study addressing this issue in a direct manner. We document strong facts regarding the increase of cash holdings for Latin American firms. We assess traditional explanations and decide which fits more properly to our sample. We build and evaluate empirically a complimentary explanation connected to ER exposure and key macroeconomic variables.

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Methodology: To address potential sources of endogeneity, we use dynamic panel data methods. In particular, we apply the system Generalized Method of Moments proposed by Blundell and Bond (1998).

Keywords: corporate finance, cash holdings, capital structure

JEL Code: G3, G30, G32

Resumo

Resultados e contribuições do artigo: Documentamos um crescimento dos recursos financeiros mantido em caixa numa amostra de empresas latino-americanas entre 2000 e 2014. Da mesma forma, a alavancagem financeira e a dívida de curto prazo apresentam uma tendência decrescente ao longo do mesmo período. Acreditamos que a teoria do trade-off pode explicar esse fenômeno. Também encontramos um efeito substancial das variáveis macroeconômicas, que afetam particularmente as firmas da região, e também os riscos cambiais.

Objetivo do trabalho: Pretendemos avaliar se as teorias do trade-off ou “pecking order” explicam o aumento dos índices de caixa para as empresas latino-americanas. Além disso, procuramos testar o poder explicativo de variáveis adicionais que capturam características macroeconômicas fundamentais das economias latino-americanas.

Relevância do tema escolhido: Devido ao seu aumento notável, as participações em caixa tornaram-se uma característica fundamental do desempenho das empresas nas últimas décadas. A necessidade de uma melhor compreensão é enfatizada pelo fato de que durante a maior parte da última década, estes experimentaram uma fase de crescimento econômico acelerado e mercados financeiros dinâmicos. O aumento resultante das oportunidades reais de investimento ao longo desse período torna as participações em dinheiro mais difícil de explicar.

Impacto na área: Não há outro estudo abordando esta questão de forma direta. Documentamos fatos convincentes do aumento das participações em dinheiro para empresas latino-americanas. Avaliamos as explicações tradicionais e decidimos qual é a mais adequada à nossa amostra. Construimos e avaliamos empiricamente uma explicação complementar relacionada à exposição ao ER e às variáveis macroeconômicas.

Metodologia: Para abordar potenciais fontes de endogeneidade, utilizamos métodos de dados de painel dinâmico. Em particular, aplicamos o Método Generalizado dos Momentos proposto por Blundell e Bond (1998).

Resumo

Resultados e contribuições do artigo: documentamos um crescimento do dinheiro mantido na caixa em uma amostra de empresas latino-americanas entre 2000 e 2014. Da mesma forma, a

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alavancagem financeira e a dívida de curto prazo apresentam uma tendência decrescente ao longo do mesmo período. Aachamos que a teoria do trade off pode explicar esse fenômeno. Também encontramos um efeito substancial das variáveis macroeconômicas, que afetam particularmente as firmas da região, como os riscos cambiais.

Objetivo do trabalho: Pretendemos avaliar se as teorias do trade off ou pecking order explicam o aumento dos índices de caixa para as empresas latino americanas. Além disso, procuramos testar o poder explicativo de variáveis adicionais que capturam características macroeconômicas chave das economias latino americanas.

Relevância do tema escolhido: Devido ao seu aumento notável, as participações em caixa tornaram-se uma característica fundamental do desempenho das empresas nas últimas décadas. A necessidade de uma melhor compreensão é enfatizada pelo fato de que durante a maior parte da última década, estes experimentaram uma fase de crescimento econômico acelerado e mercados financeiros dinâmicos. O aumento resultante das oportunidades reais de investimento ao longo desse período torna as participações em dinheiro mais difícil de explicar.

Impacto na área: Não há outro estudo abordando esta questão de forma direta. Documentamos fatos fortes quanto ao aumento das participações em dinheiro para empresas latino americanas. Avaliamos as explicações tradicionais e decidimos qual é mais adequado à nossa amostra. Construímos e avaliamos empiricamente uma explicação complementar relacionada à exposição ao ER e às variáveis macroeconômicas.

Metodologia: Para abordar potenciais fontes de endogeneidade, utilizamos métodos de dados de painel dinâmico. Em particular, aplicamos o Método Generalizado dos Momentos proposto por Blundell e Bond (1998).

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Abstract

Results and contributions of the article: We document an increasing trend for corporate cash holdings in a sample of selected Latin American firms between 2000 and 2014. Likewise, net leverage and short term debt show a fairly declining trend over the same period.

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~~*Purpose of the work:* Pretendemos testar o poder explicativo dos modelos canônicos e compará-lo com o efeito causal de outros fatores, como a exposição à taxa de câmbio e outros efeitos macroeconômicos.~~

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~~*Relevance of the chosen theme:* The need for a better understanding of this corporate cash holdings increase is stressed by the fact that during most of the last decade, the region experienced a phase of accelerated economic growth and buoyant financial markets, in the midst of the upward phase of the commodities export prices and foreign capital inflows cycle. The resulting surge in real investment opportunities along that period makes the growing cash holdings all the more puzzling.~~

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~~*Impact on the area:* We find that firm-level determinants, typically used in the corporate finance literature, barely contribute to the observed increase of cash, whereas the main drivers are macroeconomic factors such as the balance of payments and active interest rates~~

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~~*Methodology:* We use a variety of estimation procedures in order to check for the robustness of our results. Firstly, we run a pooled OLS model using standard errors of Newey and West (1987) to control for autocorrelation and, in a second estimation, errors clustered by industrial sector. Next we estimate panel models. A between model is displayed in the first place, and then two within estimations are presented, the first with robust Newey and West standard errors, and the second with standard errors clustered by industrial sector.~~

Keywords: corporate finance, cash holdings, capital structure

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Resumo

~~Resultados e contribuições do artigo: documentamos uma tendência crescente de dinheiro mantido no caixa em uma amostra de empresas latino-americanas entre 2000 e 2014. Da mesma forma, a alavancagem líquida e a dívida de curto prazo apresentam uma tendência decrescente ao longo do mesmo período.~~

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~~Objetivo do trabalho: Pretendemos testar o poder explicativo dos modelos canônicos e compará-lo com o efeito causal de outros fatores, como a exposição à taxa de câmbio e outros efeitos macroeconômicos.~~

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7 — Relevância do tema escolhido: A necessidade de uma melhor compreensão deste crescimento
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9 região experimentou uma fase de crescimento econômico acelerado e mercados financeiros dinâmicos,
10 no meio da fase ascendente da exportação de commodities. Preços e fluxo de entradas de capital
11 estrangeiro. O aumento resultante das oportunidades reais de investimento ao longo desse período
12 torna as participações em dinheiro cada vez mais intrigantes.

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17 Impacto na área: Encontramos que os determinantes de nível de empresa, tipicamente usados na
18 literatura de finanças corporativas, mal contribuem para o aumento de caixa observado, enquanto os
19 principais fatores são fatores macroeconômicos como o saldo da Balança de pagamentos e as taxas de
20 juros ativas
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24 Metodologia: Utilizamos uma variedade de procedimentos de estimação para verificar a robustez
25 de nossos resultados. Em primeiro lugar, usamos um modelo OLS usando agrupado erros padrão de
26 Newey e West (1987) para controlar a autocorrelação e, em uma segunda estimação, erros agrupados
27 pelo setor industrial. Em seguida, estimamos modelos de painéis. Um modelo between é exibido em
28 primeiro lugar e, em seguida, duas estimação within são apresentadas, a primeira com erros padrão
29 robustos da Newey e West e a segunda com erros padrão agrupados pelo setor industrial.
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46 **I. Introduction**
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49 We document an increasing trend for corporate cash holdings in a sample of firms from selected
50 Latin American countries since 2000. This increase occurred at a steady pace all through the decade
51 and spread similarly across different countries, firm size segments and industries. It was also part and
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parcel of a fairly noticeable shift in the region's corporate balance sheet structure, at least for the large, listed firms.

The need for a better understanding of this corporate cash holdings increase is stressed by the fact that during most of the last decade, the region went through a phase of accelerated economic growth and buoyant financial markets, in the midst of the upward phase of the commodities export prices and foreign capital inflows cycle. The resulting surge in real investment opportunities along that period makes the growing cash holdings all the more puzzling. However, as far as we know, no academic study exists that documents and addresses this issue.

The growing amount of cash held by Latin American firms mirrors a similar performance by advanced economies' corporates over the last 30 years. Furthermore, it reproduces the foreign reserve accumulation carried out by central banks in most emerging economies during the past decade. Although substantial media and academic attention has been devoted to both growing cash holdings in developed countries (~~(Bates, Kahle, & Stulz, 2009)~~~~Bates, Kahle and Stulz, 2009,~~ ~~(Pinkowitz, Sturgess, & Williamson, 2011;~~ Pinkowitz & Williamson, 2001) ~~Pinkowitz and Williamson, 2001,~~ ~~Pinkowitz, Stulz and Williamson, 2012,~~ ~~(Pinkowitz, Stulz, & Williamson, 2016)~~) and the foreign reserve accumulation by central banks (see, for instance, ~~Mohanty and Turner, 2006~~ ~~(Mohanty & Turner, 2006)~~), the recent increase in cash holdings by Latin American firms has been mostly overlooked by scholars.

~~Moreover, at least in advanced economies, the increase in cash holdings implies a changing financial structure, since it reduces corporate net leverage, defined as the ratio of debt minus cash, divided by the book value of assets. Bates et al (2009), in fact, show that the average net leverage of American companies fell dramatically since 1980, mainly due to the increase in cash holdings.~~

~~Regarding the causes of the cash holdings upsurge in developed countries, the studies cited above show that this occurred because firms' operating environment became riskier and more volatile, they tended to reduce inventories and receivables (which serve as an alternative source of liquidity), and increased their proportion of R&D expenditures, thus diminishing the collateral available for effective and potential creditors. This last effect seems to be stronger for multinational firms.~~

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In that context, the main purpose of this article is to assess the evolution of cash holdings in Latin American firms, and to shed light on the causes of the increase of Latin American firms' cash holdings determinants. As we show below, several rationales are advanced to explain the increase in cash holdings in firms from advanced economies. Therefore, one of our specific goals is to discuss the validity of two broad strands of the literature for explaining the observed cash holdings trends in Latin America, namely: the ~~optimal trade-off demand theory for cash~~ and the pecking order theory.

In addition, there are reasons for considering that those factors have a secondary impact on cash in Latin America. Significantly, Latin American firms face a riskier macroeconomic environment which may exceed the effects of idiosyncratic causes. ~~So~~Therefore, a second specific purpose is to discuss the importance of macroeconomic factors as explanatory variables. In particular, we seek to evaluate the impact of exchange rate exposure, the balance of payment result and economic growth, as a motives for holding cash.

We begin by providing evidence of the increase of cash holdings in a sample of large, publicly traded, non-financial firms operating in the region. We show that this pattern is pervasive and holds ~~true~~ for firms from different countries and sectors, ~~but manifests itself more acutely~~ but is stronger in Brazilian and Chilean firms.

We then ~~enquire whether the determinants of firm cash holdings in the canonical models conceived for firms from developed economies, operate in the expected way for our sample of Latin American firms. First, we tackle this question by considering~~ we discuss whether the trade-off or the pecking order theory prevail when accounting for the increase in cash holdings of Latin American firms the evolution of cash holdings in a number of subsamples of firms with different attributes. ~~By this preliminary procedure, we reveal that many of the effects predicted by the standard theory do not hold for Latin American firms in the sample period.~~

On ~~the basis of those findings~~ that basis, we further investigate whether factors *a priori* especially affecting firms from emerging markets play a relevant role in explaining firm cash holdings. These factors are ~~the firms' exchange rate exposure and the balance of payment result~~ key macroeconomic variables such as exchange rate fluctuations, balance of payment result and GDP growth. In effect, our empirical results argue in favor of ~~a~~ the preeminence-relevance of macroeconomic factors when

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7 explaining the increase in cash holdings in Latin American firms. ~~Moreover, when we investigate~~
8 ~~which of the variables considered contributed the most to the observed increase, we find that the~~
9 ~~balance of payments played a leading role.~~

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11 The rest of the paper is organized as follows. The next section presents the facts regarding the
12 cash holdings increase in our sample. It also delves into other balance sheet ~~shifts-changes~~
13 during the last decade ~~like-such as~~ the net deleveraging process, the reduction of short term debt and
14 the weakness of corporate capital expenditures. Section III, provides a review of the theoretical
15 explanations for holding cash available in the literature for firms from advanced economies, and puts
16 forward an hypothesis regarding the effects of exchange rate exposure over cash accumulation in
17 emerging countries. Section IV delves into the dataset construction and methodological issues.
18 Econometric results are presented and discussed in section V. Finally, in section VI we summarize and
19 discuss our main findings.
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30 II. Cash holdings increase in Latin American firms

31 How did cash ratios evolved for Latin American firms over the last decade and a half? Figure 1
32 displays the quarterly evolution of the median cash-to-assets ratio over the period IV-2000/IV-2014,
33 for a sample of publicly traded firms from five large Latin American countries: Argentina, Brazil,
34 Chile, Mexico and Peru. A full-sample median is also included.
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38 We find that cash ratios (defined as the ratio of cash and equivalents to total assets) increased
39 steadily over most of the sample period, growing threefold until 2011 for the whole sample of firms
40 (from 2,5% to 7,3% of total assets). Since then on, cash holdings decreased slightly, or remained
41 constant through the end of the period analyzed. Brazilian and Chilean firms showed the larger
42 increase, climbing almost fourfold, from 2.6% in 2002 up to 9,5% in 2010, and from 1,2% to 4,9%,
43 respectively. For the rest of the countries, cash ratios experienced a steady but slower rise until 2010.
44 By the end of the period, Brazilian firms stand as those holding the largest cash ratios of the sample,
45 hovering around 9% of total assets.
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52 **Figure 1**

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Furthermore, this net deleveraging process goes along with a noticeable contraction of the short term debt ratio (ratio of current liabilities to total assets). ~~When we regress the short term debt ratio on a constant and time, the time coefficient is significant and also represents a yearly decrease, at an average pace~~ of 1.2 percentage points (pp) ~~a year~~.

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These findings concerning corporate debt dynamics may seem bewildering given that they occur in the midst of an international capital markets bonanza which ~~may should~~ have pushed upwards the region's private sector indebtedness. However, they are consistent with previous research that finds that, rather than increasing their leverage so as to further finance private investment, Latin American firms took advantage of the favorable financial conditions by increasing their average maturity of debt ~~(Schmukler and Didier, 2014)~~ (Didier & Schmukler, 2014), and smoothing its amortization profile ~~(Bastos et al., 2015)~~ ~~(Rodrigues Bastos, Kamil y Sutton, 2012)~~.

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Moreover, the cash holdings buildup accompanies a somewhat disappointing performance of corporate investment in the region over the last decade. In fact, ~~Manuelito and Jimenez (2015)~~ ~~(Manuelito & Jiménez, 2012)~~ and ~~(International Monetary Fund, 2015)~~ ~~IMF (2015)~~ claim that in the light of several indicators (investment dynamism in other peripheral regions, improvements in demand and profitability, and larger private savings) private investment in Latin America fell behind expectations. By the same token, ~~(Pérez Artica, Delbianco, & Brufman, 2017)~~ ~~Pérez Artica, Delbianco and Brufman (2016)~~ document a growing pattern of corporate net lending, mostly driven by corporate investment ~~feebleness~~ ~~weakness~~.

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III. A ~~brief~~ review of the literature on cash holdings in advanced and emerging countries

a. The literature on corporate cash holdings in advanced countries

What are the causes driving the cash holdings increase in Latin American firms? Drawing on ~~a profuse literature that addresses the study~~ ~~the literature of corporate~~ of cash holdings in firms from advanced economies, in this section we outline a preliminary set of determinants driving the cash holdings buildup in our sample. We classify this literature according to whether theories consider the possibility of attaining optimal levels of cash ~~(with or without agency problems preventing firms from~~

doing so), or instead see cash ratios as a residual outcome of the firm's financial function. One of the purposes of our empirical study will be to discuss whether one of these two competing approaches prevails.

a) ~~Optimal cash holdings~~ Trade-off theory and cash holdings.

Trade-off theory posits that firms choose ~~Optimal cash holdings~~ may be defined as those maximizing that maximizes firm value. ~~Likewise, w~~ We can split this approach between two of the motives for demanding cash ~~advanced by Keynes (1936),~~ namely, the *transaction* and *precautionary* motives. ~~Agency problems arising from managers' self interest may erect impediments hindering prevent such optimal levels of cash from being achieved.~~ We discuss all three both motives below.

The transaction motive. Provided that external financing is secured for a given firm, ~~it must still be the case that the firm~~ it may still incurs transaction costs ~~involved in the collection of when collecting~~ cash, whether through debt or equity ~~issuances~~ issues, or else by converting noncash assets into cash. Firms will thereby hold a cash ratio that minimizes the sum of two types of costs: on the one hand, the opportunity cost involved in holding non-profitable liquid assets; on the other, the transaction costs associated to each operation by which firms obtain cash. Classical studies in finance have modeled this motive (~~Baumol, 1952, Baumol, 1952; Miller and Orr, 1966~~ (Miller & Orr, 1966)).

Several factors operate determining the optimal level of cash demanded because of this motive:

(i) ~~Transaction costs of external finance. The cost of accessing external finance~~ First, the transaction costs of external finance will be higher for firms that have never accessed public markets or credit lines from the banking system. Consequently, cash ratios will should be lower for firms with higher, better debt rating or credit lines. Furthermore, liquidity may be secured by selling off noncash assets, but this can only be attained at a discount. Therefore, firms with mostly firm-specific operating assets ~~may be encouraged to hold higher levels of liquid assets~~ (Opler, Pinkowitz, Stulz, & Williamson, 1999; Bates et al., 2009).

(ii) ~~Cash flow risks. Higher variability of internal finance may lead to negative or excessively lower than expected cash flows, thus increasing the risk of a financial disruption.~~

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Consequently, a higher propensity to hold cash should take place among firms facing more volatile cash flows, particularly if hedging instruments are not available or happen to be excessively expensive.

Economies of scale. Second, following Miller & Orr (1966), Miller and Orr (1966), managing cash holdings may entail considerable economies of scale. As a result, larger firms are expected to hold lower cash ratios. More recent literature focuses in the existence of economies of scale reducing the need for cash when firm size increases. This has been documented, for instance, in (Mulligan, (1997); Natke & Falls, 2010) or Natke & Falls (2010).

(iii)

Precautionary motive. When access to external financing is impaired, firms may hold cash in order to hedge against financial constraints hindering preventing the accomplishment completion of profitable investment opportunities.

The theoretical benchmark behind this motive is that of the irrelevance of the financial structure posed by Modigliani and Miller (1958). In effect, with perfect capital markets (absence of income taxes, asymmetric information and insolvency costs), any project with positive net present value will obtain financing, and firms will achieve their optimal level of investment.

In real financial markets, however, a variety of reasons lead to financial constraints for certain types of firms. Different studies attempt to explain why, for instance, equity issuances result relatively less attractive for investors and thus more expensive than internal cash flow (Myers and Majluf, 1984). Moreover, moral hazard or adverse selection issues may lead to credit constraints and thus reduce the financing available to constrained firms well under the level they would demand at market interest rates (Stiglitz and Weiss, 1981).

A number of scholars have addressed the role of liquidity holdings, cash flows, and capital structure management in order to moderate the effects of financial constraints over firm investment.

Unable to obtain external finance. It has been shown that, for constrained constrained firms, there is show a cash flow sensitivity of corporate investment, in the sense that a positive relation emerges

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between a firm's cash flow and its capital expenditures (Fazzari, Hubbard and Petersen, 1988; Stein, 2001). (Ağca & Mozumdar, 2017; Fazzari, Hubbard, & Petersen, 1988; Stein, 2003)

(Holmström & Tirole, (2000) Holmström and Tirole (2000) show that, faced to the risk of the need of cash infusion in case a new investment opportunity emerges or unforeseeable liquidity requirements of current projects arise, constrained firms will demand a positive amount of cash.

Important contributions have documented a propensity of constrained firms to save cash out of cash flows, while unconstrained firms cash holdings show no systematical relation to cash flows (Acharya, Almeida, & Campello, 2007; Almeida, Campello, & Weisbach, 2004)

A variety of factors determine the level of precautionary cash demand in presence of financial constraints.

Firstly, (Opler et al., (1999) Opler et al (1999) show that corporate demand for cash falls when access to credit and financial leverage improves. Firms with higher firm-size and payout ratios are typically— considered less financially constrained (for a discussion of these and other financial constraints measures, see (Whited & Wu, 2006)

Second, the cash ratio increases for constrained firms with better and more profitable investment opportunities (as measured by return on assets, cash flows or market-to-book ratios), which act as proxies for financial distress costs (Bates et al., 2009).

(3)Third, higher volatility of the operative operating environment and cash flow; and finally, (4) a higher proportion of R&D expenditures.

Brown and Petersen (2011) show that R&D expenditures are subject to higher financing frictions, given their poor collateral value and potential information problems. Consequently, R&D intensive firms face debt issues constraints and must rely on more volatile sources of funding, like equity issues and cash flows. However, R&D expenditures bear high adjustment costs associated to wage payments to highly skilled workers, thus making very expensive for firms to periodically adjust R&D expenditures to the changing level of financing at disposal. Therefore, R&D intensive firms facing financing constraints are encouraged to build a liquidity buffer in order to smooth R&D expenditures

Many studies provide evidence that cash ratios are determined by cash flow and other operative operating variables' volatility. In effect, idiosyncratic volatility impacted positively on cash

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ratios of US, German and French firms (Baum et al., 2008) (Baum, Caglayan, & Talavera, 2008; Baum, Schäfer, & Talavera, 2007), (Baum, Schäfer and Talavera, 2007). Moreover, it has been shown that idiosyncratic volatility went through a protracted upward trend since the 1960s, mainly driven by the increase in volatility of fundamental variables like cash flow, net sales and profitability (Irvine & Pontiff, 2009).

Crucially, macroeconomic volatility has been shown to affect firm demand for cash in advanced countries (Baum et al., 2006) (Baum, Caglayan, Ozkan, & Talavera, 2006), as well as in developing countries like Argentina, Mexico and Turkey (Demir, 2009) (Demir, 2009).

~~Corporate governance, managerial agency costs and firm cash holdings. So far we have discussed the determinants of cash ratios that maximize the firm value. Nevertheless, a great deal of the corporate finance literature dwells on the implications for firms cash demand stemming from the conflict between self-interested managers and shareholders. More specifically, a number of studies postulate that managers are prone to holding cash ratios well above those that maximize firm value. According to Jensen (1986), managers of firms with high free cash flows are willing to stockpiling it as cash reserves rather than disbursing it to shareholders, even if a profitable investment opportunity fails to arise. Payouts to shareholders diminish managers' control and power, and make it more likely that they will incur the monitoring of the capital markets when the firm must obtain new external finance.~~

~~In this sense, Dittmar, Mahrt-Smith and Servaes (2003), Dittmar and Mahrt-Smith (2007) and Harford (1999) provide evidence that less effective corporate governance mechanisms to control managers lead to higher cash ratios. However, another branch of the literature complies that it is not theoretically clear how self-interested managers will chose between spending free cash flows and stockpiling it as cash reserves (Harford, Mansi and Maxwell, 2008). Additionally, Bates, Kahle and Stulz (2009) find no evidence of a significant effect of agency problems over the long term increase in the cash holding of US firms.~~

b) The pecking order theory

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~~The pecking order theory.~~ We now consider the hypothesis that firms do not pursue ~~an an~~ optimal level of cash, ~~but instead this fluctuates as a result of their financial inflows and payments.~~ Myers (1986). Myers (1984) sketches a financial hierarchy typically followed by firms in order to meet their liquidity needs, sequentially moving from one source to the ~~next following,~~ when financing provided by the first is depleted: (i) retained earnings; (ii) safe-debt issues, (iii) risky-debt issues, and (iv) stock issues.

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~~Two alternative rationalizations of the financial hierarchy are found in the literature. First, it may arise from an agency problem, with managers trying to avoid the financial discipline imposed to them by investors and creditors (Dittmar & Mahrt-Smith, 2007; Jensen, 1986). Second, it may be an optimal response to information asymmetries pushing external financing costs upwards.~~

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~~If that is the case, the cash ratio becomes a residual outcome of two opposing financial flows: the firm's cash flow, on the one hand, and its applications, investment requirements and debt disbursements, on the other. That is, whenever the firm receives a flow of funds superseding the level of investment and debt payments, cash will be stockpiled. If the opposite is true, then cash ratios will be reduced as the firm's payments requirements will be met by using previously accumulated cash.~~

~~According to Myers (1986), even when this sequence of financial sources does not corroborate for every firm, it properly describes the dependence of internal finance and debt observed in the aggregate. Two alternative rationalizations of the financial hierarchy can be identified in the literature. First, it may arise from an agency problem, with managers trying to avoid the financial discipline imposed to them by investors and creditors (Donaldson, 1961). Second, it could also be taken as an optimal response to information asymmetries pushing external financing costs upwards.~~

A ~~theoretical-classical~~ model based on this last rationale is offered by Myers and Majluf (1984) (Myers & Majluf, (1984). Information asymmetries may lead to substantial increases in the cost of equity, leading firms to avoid ~~raising funds in the form of equity~~ issuing it. Consequently, if cash flows are high enough to invest in profitable investment opportunities available and repay debt becoming due, firms accumulate the remaining cash flows in the form of liquid assets. Henceforth, information problems explain ~~theoretically~~ the existence of a hierarchy and, thereby, the idea of cash holdings as a byproduct of this financial behavior.

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8 firm's cash flow, on the one hand, and its applications, investment requirements and debt
9 disbursements, on the other. Whenever the firm receives cash flows superseding the level of
10 investment and debt payments, cash will be stockpiled. If the opposite is true, cash ratios will be
11 reduced as the firm's payments will be met by using previously accumulated cash.

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15 One logical consequence of this is that cash dividend payments will decrease cash holdings.
16 However, more recent studies claim that payout ratios will grow when the cash flow increases
17 exceeding the current and expected liquidity requirements (Benavides, Berggrun, & Perafan, 2016).
18 Therefore, in presence of substantially high cash flows, cash holdings and dividends may both increase
19 at a time.

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26 Summing up, if the pecking order theory explains the cash holdings evolution of Latin American
27 firms, we should expect a positive relation of cash flows, and a negative effect of capital expenditures
28 and debt repayments. Regarding dividend payments, they may relate positively or negatively with
29 cash.

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35 One of the purposes of our article is to assess whether one this two broad explanations prevails
36 when accounting for the increase in Latin American firms cash. Empirically distinguishing
37 between theories advancing optimal levels of cash trade-off and the pecking order theory on an
38 empirical basis is not an easy task, as discussed should focus on their opposite predictions. y Opler et
39 al (1999). Even though firms with high cash flows are expected to hold more cash according to the
40 financial hierarchy model, frequently firms with high cash flows are expected to be profitable in the
41 future and thus exhibit better investment opportunities. Therefore, finding a positive relation between
42 cash flow or investment opportunities, on the one hand, and cash ratios on the other, does not allow us
43 to decide between both theories.

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51 Following Opler et al (1999), when evaluating the empirical results in Section V, we will assess
52 the preeminence of one theory over the other on the basis of three variables: capital expenditures, firm
53 size, and dividends payout ratio. consider that, according to the pecking order theory:
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~~Firms that invest more should accumulate less cash.~~

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~~Larger firms presumably have been more successful, and hence should have more cash after controlling for investment.~~

~~Trade-off theories hypothesize that (i) firms with more capital expenditures should accumulate more cash to prevent financial constraints, (ii) larger firms should exhibit lower cash ratios, because of economies of scale and more pledgeable assets at hand; and (iii) firms paying dividends are less financially constrained and should hold less cash.~~

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~~In contrast, according to the pecking order theory: (i) firms with more capital expenditures should accumulate less cash, (ii) larger firms presumably have been more successful, and hence should have more cash after controlling for investment (Opler et al., 1999), and (iii) firms paying dividends may demand either less cash holdings, or more cash holdings in presence of high cash flows.~~

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~~optimal cash ratio theories hypothesize that firms with more capital expenditures should accumulate more cash in order to circumvent financial constraints. And larger firms should exhibit lower cash ratios, as a result of economies of scale and more pledgeable assets at hand.~~

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Some preliminary evidence in Latin American firms

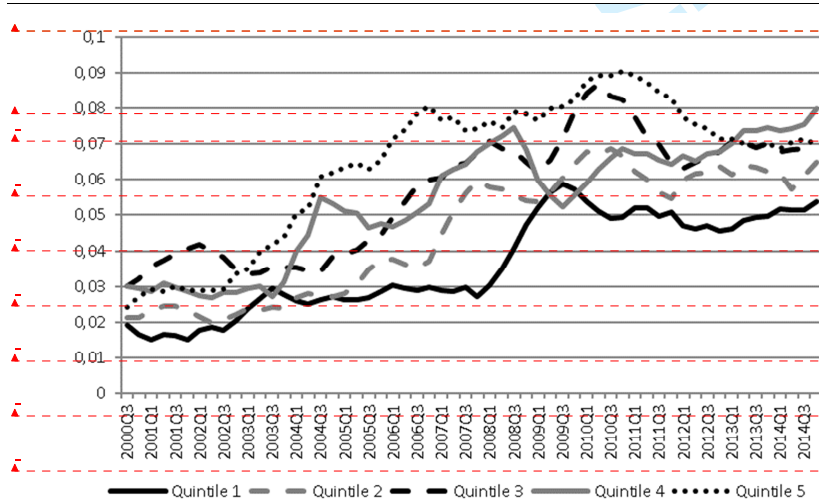
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A first hint as to the actual impact of some of these determinants of cash holdings in our sample may be grasped by tracking the evolution of the cash ratios of firms in different segments or groups within our sample. To begin with, we assess whether firm size played a relevant part in shaping the average increase in the cash ratio, by dividing the sample firms into quintiles of size on the basis of the book value of assets averaged over the sample period.

Figure 3 shows the median cash ratio for the firm size quintiles over the period covered in the sample. In the light of the optimal cash ratios theories discussed above, Figure 3 conveys a rather counterintuitive pattern, with the larger size quintile cash ratio showing a considerably sharper increase until the end of 2009, and the smaller size quintile displaying the weakest growth. This counters the notion of economies of scale and the role played by pledgeable assets as a covenant easing credit access for financially constrained firms. Instead, the size distribution of the cash ratio increase seems consistent with the pecking order theory.

Similarly, the effect of operativeoperating volatility can be roughly evaluated by considering the evolution of cash holdings for firms in different segments volatility quintiles. As a measure of operativeoperating volatility we compute the coefficient of variation of the net cash flow from operativeoperating activities for each firm. Figure 4 exhibits the median cash ratio for each quintile of operativeoperating volatility. At first sight, similar to firm size, volatility seems to perform a role opposite from expected according to optimal cash ratio theories. The less volatile firms exhibit the larger increase, and a clear-cut negative relation between volatility and cash accumulation surfaces.

Figure 3



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Figure 3. Median Cash to assets ratio by firm size quintile.

Nevertheless, the econometric results presented in Section V, where this relation is controlled for other determinants, suggests this raw-data approach might result misleading, as the coefficient on size turns out negative or non-significant and the coefficients for volatility become positive and statistically significant.

Figure 3

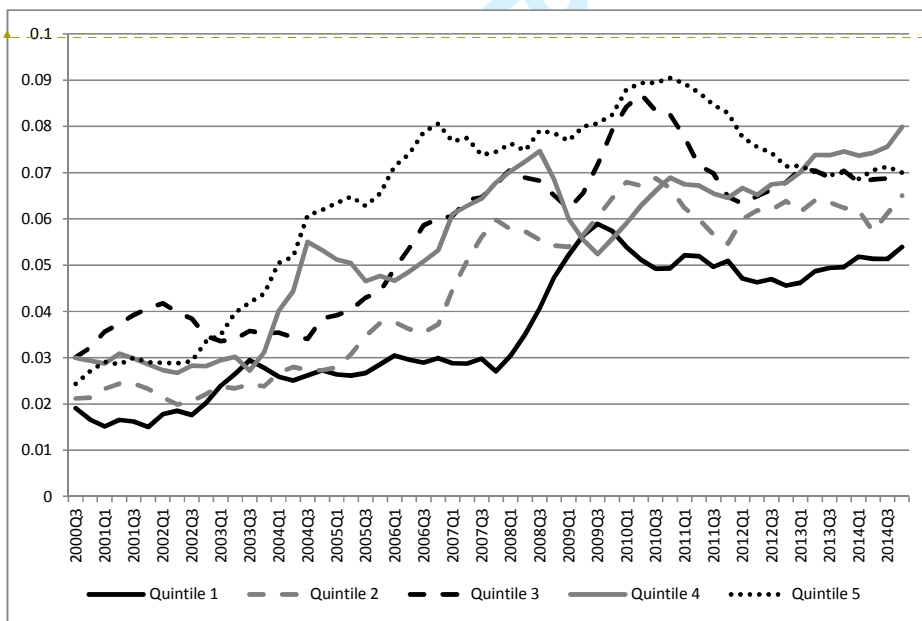


Figure 3 displays the evolution of the median cash-to-assets ratio for each firm size quintile in the sample.

On the other hand, an important insight arises when we consider the role played by the net cash flow. Figure 54 illustrates how the cash ratio evolved for each sample quintile of net cash flow normalized by total assets. It points to a significantly larger upsurge in the cash ratio of firms in the

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quintiles receiving the higher net cash flows. We can therefore infer that firms with the most profitable investment opportunities are urged to stockpiling larger amounts of liquidity as an internal source of finance. In the same vein, this positive relation between net cash flows and cash ratios seems to confirm the pecking order theory.

Figure 4

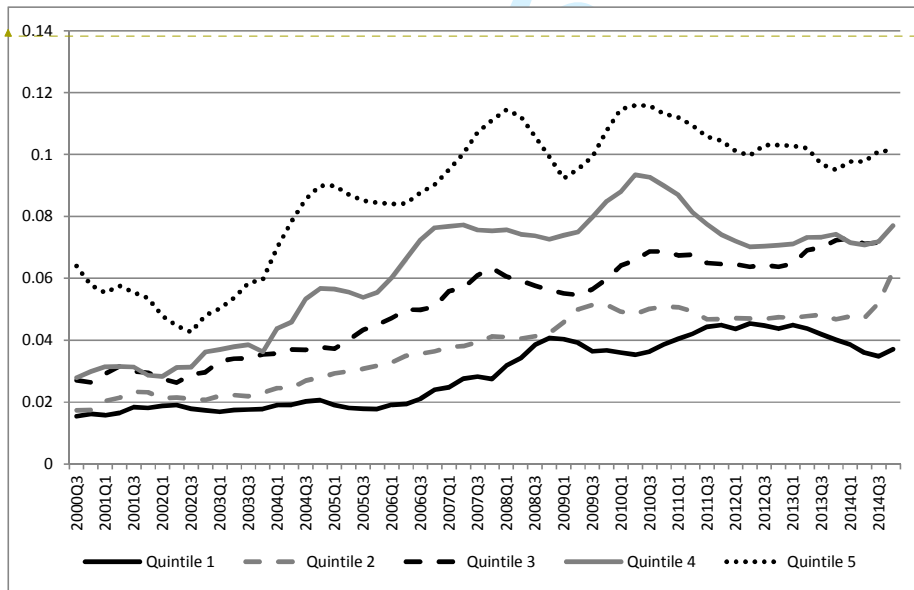


Figure 4 shows the median of the cash ratio for firms from each quintile of cash flow in the sample, as measured by the ratio of Net Cash Flow from operating activities to Total Assets.

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Figure 5

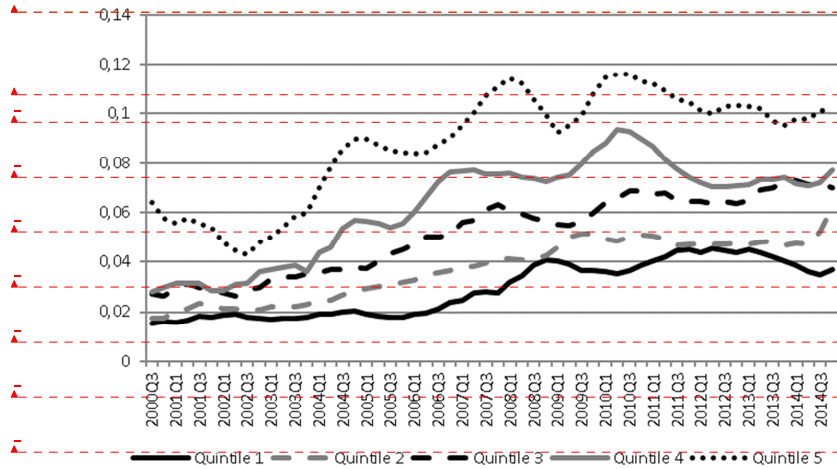


Figure 5 Median cash to assets ratio by cash flow quintile.

A preliminary insight as to the way access to external finance affects the cash demand is offered in Figure 65, where we show the median cash ratio for each quintile of leverage. The largest increase in cash holdings occurred in the least indebted quintile, while firms in the fifth quintile drove a milder cash accumulation. This is consistent with the expected effect of leverage over transaction costs of accessing external finance, and the need for more internal finance accumulation experienced by less leveraged and more financially constrained firms.

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Figure 5

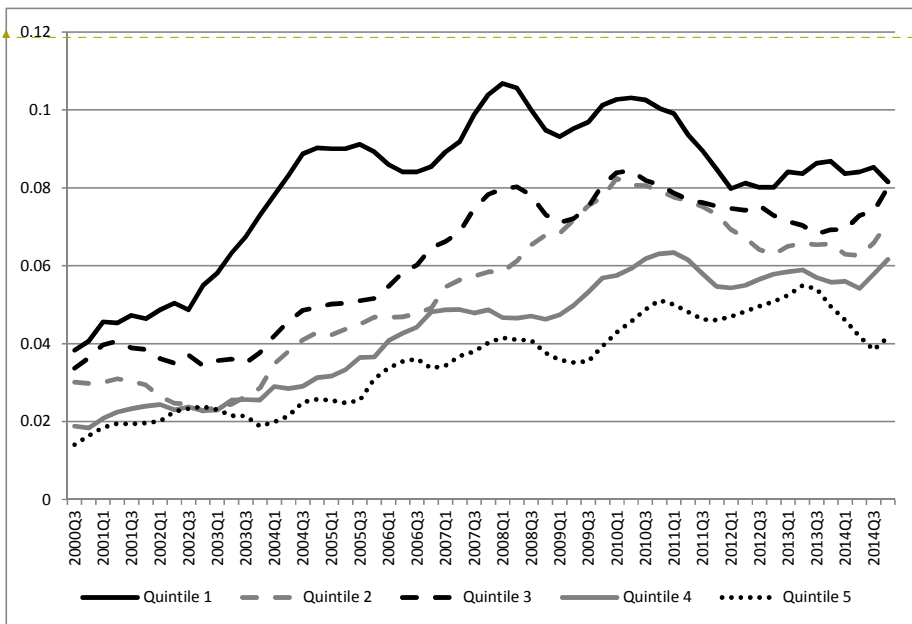


Figure 5 shows the median cash-to-assets ratio for firms in each quintile of Leverage. Leverage is measured as the ratio of Total Liabilities to Total Assets.

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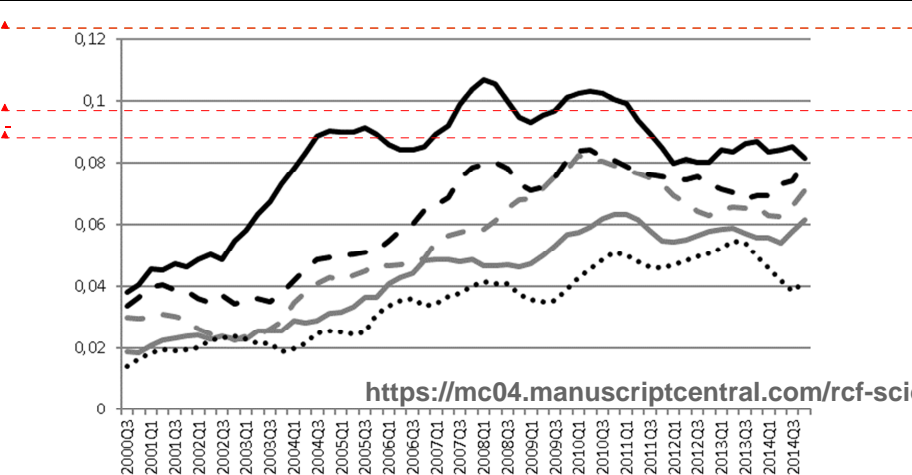
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Figure 6



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~~However, when considering the determinants of cash holdings of firms operating in emerging market economies, the exchange rate exposure *a priori* might play a relevant role. Indeed, when~~
operating in emerging ~~and developing~~ economies, firms are compelled to ~~using-use~~ a local currency ~~that faces a risk of-prone to~~ depreciation, thereby jeopardizing their financial health. ~~Indeed, contrary to what is found for developed economies~~ (Guay & Kothari, 2003) ~~when a depreciation occurs, firms from emerging countries face negative effects~~ (Galindo, Panizza, & Schiantarelli, 2003) (Júnior, 2011).

~~Traditionally, scholars measure the exchange rate exposure as the sensitivity of firm market value to foreign exchange variations (for a survey, see Muller and Verschoor, 2006). We apply a different, somewhat more direct, take at the exchange rate fluctuations' impacts over firms' financial management and cash accumulation. When assessing the determinants of currency risk management,~~
(Schiozer & Saito, (2009) find that the main determinant of financial risk for firms from Latin America is the cost of financial distress associated to balance sheet currency mismatch. That is, holding liabilities denominated in foreign currency and assets denominated in local currency. Importantly, (Chui, Kuruc, & Turner, (2016) show that this kind of currency mismatches have been on the rise in Latin American firms over our sample period. However, when firms are able to use operational hedges their currency exposure falls (Schiozer & Saito, 2009). For instance, an exporting firm whose revenue is denominated in foreign currency will face less currency risk.

~~Scholars typically measure the exchange rate exposure as the sensitivity of firm market value to foreign exchange variations (for a survey, see (Muller & Verschoor, 2006). However, in order to take into account the operational hedging mentioned above, we apply a more direct approach at the exchange rate fluctuations' impacts over firms' financial management, and cash accumulation.~~

~~We distinguish two kinds of risks arising from exchange rate fluctuations: (1) the impact of ER over firms' operating cash flows; and (2) the impact of ER on the firms' balance sheet. Currency depreciations produce a number of impacts upon firms' operational profitability and balance sheet, particularly if a currency mismatch between corporate assets and liabilities composition occurs.~~

~~First, it modifies in foreign currency terms the value of cash flows from operational activities denominated in domestic currency. The sign of this effect depends on whether t[he domestic currency-denominated cash flow may increases or decreases as a result with a currency-of-the-currency~~

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7 depreciation. There are two typical cases. Following a depreciation, ~~firms operating in export-oriented~~
8 ~~sector~~exporting firms, for instance, may experience an increase in their domestic currency-
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10 denominated cash flow. Instead, firms from non-tradable sectors may see their costs increase faster
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12 than their ~~turnover income~~revenue, hence ~~diminishing facing a contraction in~~ their cash flow.

13
14 Second, ~~it increases depreciations increase~~ the burden of foreign currency-denominated debt in
15 presence of currency mismatch, and thus may worsening lead the firm to a costly financial distress~~the~~
16 ~~firm's financial prospects~~. Financial disbursements such as interest and principal repayment of dollar
17
18 denominated debt will escalate in domestic currency terms, whereas the value of assets may fall
19
20 behind.

21
22 ~~if the firm fails to match the currency composition of assets and liabilities.~~

23
24 Therefore, ~~t~~The risk of incurring losses as a consequence of currency depreciationcurrency risks
25
26 may lead firms to increase cash holdings as a hedging strategy when other hedging instruments are not
27
28 available. Particularly Cash and other assets of equivalent liquidity, particularly when denominated
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30 in foreign currency, cash holdings may do away with or help mitigate the currency risk ~~by serving as~~
31 ~~an asset whose domestic currency value increases in case of a depreciation, or by allowing a fast~~
32 ~~conversion to foreign assets.~~

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37 Summing up, ~~T~~wo sources of exchange rate exposition can be identified, which can also be
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39 separately measured and whose impact on cash holdings can be investigated. Namely, the
40
41 ~~operative~~operating exposure, measuring the sensibility of ~~operative~~operating profits or cash flows to
42
43 ER; and the balance-sheet exposure, which accounts for the sensibility of financial leverage to ER.

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45 Macroeconomic variables. On the other hand, differences in the macroeconomic context may
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47 exert additional impacts over firm propensity to hold cash. In particular, a surplus balance of payments
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49 may lead firms to lower cash holdings given that it reduces the need to hedge against ER depreciation,
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51 and instead introduces expectations of domestic currency appreciation. ~~(Médici & Panigo, (2015))~~In
52 ~~additions~~show that, for countries facing balance of payments constraints, persistent net commercial
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54 surpluses and capital inflows would ease foreign currency restraints thereby spurring economic
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growth. This, in turn, should boost investment opportunities affecting the demand for cash. On the contrary, persistent balance of payments deficits stimulate ER depreciation expectations, and thus will push firms to hedge against its damaging effects over firm performance.

Additionally, as discussed in Baum, Caglayan, Ozkan & Talavera (2004), (Baum et al., 2006) macroeconomic variables such as GDP growth should capture the aggregate fluctuations of investment opportunities. Additionally, the interest rate would proxy for the private cost of funds and thus affect the firm-level opportunity cost of holding cash.

In sum, we expect firms exposure to ER, ER depreciations and the country's balance of payment result to be non-negligible determinants of the cash holdings of Latin American firms. ER and ER exposure should have positive effects, while the third should impact negatively. Besides, as long as it represents aggregate investment opportunities, we expect GDP growth to produce higher cash holdings if the trade-off model prevails. Interest rates should affect negatively the level of cash, for they increase its opportunity cost.

Development banking. Given that the literature finds particularly strong causal effects of financial variables on cash holdings, we should pay attention to one main source of asymmetries in access to finance across Latin American countries: the presence of one of the largest development banks in the world, the BNADES, operating in Brazil. Development banks are supposed to specialize in long term lending, to promote new industries and firms (Ferra et al., 2013)(Ferraz, Além, & Madeira, 2013). Although there is ambiguous evidence of its effectiveness (Lazzarini et al., 2015) (Lazzarini, Musacchio, Bandeira-de-Mello, & Marcon, 2014), it is important to control our results for this fact given that Brazilian firms will presumably benefit from relatively easier and subsidized access to finance. We thus expect financial constraints to have weaker effects on firms from Brazil.

IV. In sum, we expect firms exposure to ER, ER and the country's balance of payment result to be non-negligible determinants of the cash holdings of Latin American firms.

V. IV. Data and Methodology

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In order to investigate whether the theoretical determinants of cash holdings discussed above provide a suitable explanation for the cash holdings patterns observed in firms from Latin America, we perform an econometric analysis. In this section we describe the database used, and present the baseline and extended models considered. Besides, we describe the construction of the main variables and discuss the main econometrical issues.

Our sample is built ~~on the basis of~~based on quarterly, firm-level data, ~~the bulk of which comes~~ from the Compustat Global Fundamentals Database. As already mentioned, we restrict our sample to only five large Latin American countries for which a sufficient number of individual firms report fundamentals data, namely: Argentina, Brazil, Chile, Mexico and Peru. The sample period is 2000Q1-2014-Q4. We exclude financial and insurance companies (SIC Codes 6000 to 6999).

~~Firms are classified in thirteen broad sectors of industrial activity as follows: (1) Agriculture, forestry, fishing and livestock; (2) Mining, gas and petroleum; (3) construction; (4) food and kindred manufactured products; (5) textile and furniture products; (6) heavy manufacturing industries, paper and pulp, chemical, petrochemical, steel, aluminum; (7) fabricated metal products, machinery and equipment, transport equipment; (8) electronic products and durable consumer goods; (9) transportation; (10) communications; (11) public utilities; (12) wholesale and retail trade; (13) other services.~~

We also include macroeconomic variables from the International Monetary Fund's International Financial Statistics (IFS-IMF).

The model. The dependent variable is defined as the cash-to-assets ratio. First, we evaluate a baseline model regressing the cash ratio on a set of independent variables intended to capture the effects of the transaction and precautionary motives ~~of optimal cash holdings~~, and the pecking order theory. This allows us to ~~check evaluate~~ whether the ~~optimal cash holding~~trade-off or the pecking order theory hold ~~true~~ in our sample ~~of firms~~. Subsequently, we consider an extended model, adding two variables that reflect the impact of exchange rate exposure, and a set of macroeconomic variables. In what follows, we describe the ~~main explanatory~~ variables in detail and the econometric issues.

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- *Size.* ~~Following the literature (Bates, Kahlen & Stulz, 2009)~~ (Bates et al., 2009). ~~We~~ measure firm size as the natural logarithm of the book value of total assets. ~~We~~ expect the coefficient of firm size to be negative if firms pursue an optimal level of cash. Instead, we expect the size coefficient to be positive if the pecking order theory holds true.

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- *Net Cash Flow.* This is represented by the cash flow from ~~operative~~operating activities divided by the book value of total assets. According to both theories, this coefficient is expected to be positive.

- *Dividends to assets.* We construct this measure as the ratio of cash dividends paid to total assets. We expect the coefficient to be negative if the precautionary motive holds ~~true~~, since firms with higher payouts may reduce the distribution of dividends when investment opportunities arise and external finance is not available. ~~(Fazzari, Hubbard, Petersen, 1988)~~ (Fazzari et al., 1988). Likewise, ~~as discussed above the pecking order theory predicts a negative coefficient, for dividends reduce the stock of cash available does not predict a particular sign of the coefficient.~~

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- *Gross Capital Expenditures.* ~~We compute a measure of firm e~~Capital formation ~~is measured by through~~ the capital expenditures divided by the book value of total assets. According to the ~~theory of optimal demand for cash~~trade-off theory, we expect the coefficient on capital expenditures to be positive, given that more investment opportunities lead firms to accumulate more cash, as a hedging strategy against financial constraints. Pecking order theory would predict a negative coefficient.

- *Sales growth.* Another measure of investment and corporate growth opportunities is provided by the firm sales growth rate. We compute this as the first difference of net sales, divided by the net sales level. If higher investment opportunities were to increase the demand for cash, this coefficient ought to be positive.

- *Net working capital.* Net working capital amounts to current assets like inventories and short term accounts receivable. These are supposed to serve as substitutes for cash, and hence are expected to have a negative coefficient. ~~(Opler, Pinkowitz, Stulz & Williamson, 1999, Bates, Kahlen & Stulz, 2009)~~ (Bates et al., 2009; Opler et al., 1999).

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- *Leverage.* As explained above, leverage is measured as the ratio of the book value of total liabilities to total assets. Given this is a measure of the extent to which firms access credit and debt markets, we expect this coefficient to be negative, reflecting a lower need to hedge against financial constraints.

- *Short-term leverage.* We include a specific variable accounting for the short term leverage. In order to differentiate between the effects of overall indebtedness and debt coming due in the short term, which This should generate cash requirements in the short term, and thus increase cash ratios, we include a specific variable accounting for the short term leverage. We compute this as the ratio between current liabilities and total assets.

- *Non-operativeoperating assets.* As discussed above, firm-specific assets eoperate diversification isare expected to correlate negatively positively with cash holdings, since diversified firms can rely on ~~the~~ selling off of non-core assets at a lower discount in order to secure liquidity. We capture this idea by measuring the proportion of total assets represented by assets other than operativeoperating ones. Non-operativeoperating assets are defined as those non-current assets other than fixed assets. We normalize it by the book value of total assets, and expect its coefficient to be negative.

- *Sales volatility.* We measure volatility of the operativeoperating environment by computing a 5-quarter rolling coefficient of variation of the firm's net sales. We expect this coefficient to be positive, given that higher volatility increases hedging needs.

- Exchange rate operative exposure. We aim to measure the degree to which a firm is exposed to being harmed by foreign exchange depreciations. As discussed above, we identify two different channels for this. First, through an impact of depreciations on firms' operativeoperating performancecash flow. Second, by an impact on its balance sheet.

We measure a firm's operativeoperating exposition to EXER by computing the correlation between its cash flow from operations and the corresponding country exchange rateER. ER is measured as a dollar price in national currency terms, so a depreciation is capture by an increase in ER. Equation 1 shows how we compute this correlation.

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$$FXER \text{ Operative Exposure}_i = corr(ncf_{operations_i}, FXER)$$

[Eq. 1]

For a given firm, we interpret a negative correlation between these variables as showing a negative impact of depreciations on its operativeoperating performance. This should lead the firm to increase the demand of cash in case it faces unpredicted liquidity requirements.

Likewise, we interpret a positive correlation as showing a positive impact of depreciations on its operating performance. This should reduce the hedging need for cash. Thus, we expect the ER operative exposure to have a negative coefficient.

OperativeOperating FX Exposure. For each firm, We capture the impact of exchange rate fluctuations over firm's operativeoperating performance through by computing a time-invariant Pearson correlation coefficient between the firm's cash flow from operativeoperating activities and the country's foreign exchange rate (measured as national currency price of a US dollar) and the firm's cash flow from operative activities. Firms with a negative correlation between cash flows and foreign exchange, are supposed to being negatively exposed by depreciations. They should draw on more cash in order to face unpredicted liquidity requirements. Hence, we expect this coefficient to be negative.

Balance Sheet FX-ER Exposure. Likewise, the effect of foreign exchange depreciation on firm balance sheet is grasped by computing a Pearson correlation coefficient between the country's foreign exchange and each firm's leverage ratio.

$$ER \text{ Balance Sheet Exposure}_i = corr(leverage_i, ER)$$

[Eq. 2]

Firms with positive and high correlation coefficient are supposed to being negatively exposed to depreciations, and should experiment more pressure to demandneed for cash or other liquid assets as a hedging artifactinstrument. Firms with lower correlation coefficient, on the contrary,

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have balance sheets less vulnerable to ER depreciations, and thus will need less cash. ~~Thus~~ Consequently, we expect ~~this the~~ regression coefficient of our ER Balance Sheet exposure ~~measure~~ to be positive.

~~_____~~ *Macroeconomic effects.* Differences in the macroeconomic context may exert ~~additional effects over firm propensity to hold cash.~~ For instance, firms operating in a high macroeconomic growth environment are supposed to face better investment opportunities. Similarly, lower pressures to hedge against exchange rate exposure arise in periods of surplus balance of payments. As a result, we ~~we~~ aim to capture and control for ~~these the~~ aforementioned effects of macroeconomic forces adding to our ~~independent variables model~~ four macroeconomic factors ~~variables~~ potentially influencing firm penchant for hoarding cash reserves: foreign exchange depreciation rate, the balance of payment surplus (deficit) as a percentage of GDP, GDP growth rate, and the active interest rate. We obtain these four variables, on a quarterly basis, from the International Financial Statistics Database and Balance of Payments Database of the International Monetary Fund.

We test the stationarity of these macroeconomic variables using the panel unit-root ~~test of~~ (Levin, Lin, & Chu, (2002) ~~Levin-Lin-Chu (2002)~~. The results show that all four series are stationary around a deterministic trend.

~~¡CL INTRODUCIR LOS RESULTADOS DE LOS TEST DE ESTACIONARIEDAD DE ESTAS VARIABLES SEGUN EL COMENTARIO 8~~

Table 1
Levin-Lin-Chu unit-root test for macroeconomic variables

	GDP	ER	BOP	Interest Rate
Unadjusted t	-6.6169	-19.0543	-14.4664	-10.2793
Adjusted t*	-3.4801	-18.6085	-11.6946	-5.9446
P-Value	0.0003	0.0000	0.0000	0.0000

Table 1 displays the t statistic and P-Value of the Levin-Lin & Chu (2002) panel unit-root test for each of the macroeconomic variables included in our extended model. The test specification includes panel means, a time deterministic trend and cross-sectional means are removed. The ADF regressions lags structure is chosen by a Akaike Information Criterion.

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Interaction terms for Brazilian firms. The easing of credit availability produced by development banks should relax the effects of credits constraints over Brazilian firms, which may access subsidized, long-term credit from BNADES. We include two interaction terms to capture this effect. First, one between a dummy for Brazilian firms and the logarithm of Total Assets. Given that financial constraints are negatively related to size, and Brazilian firms are supposed to face less constraints, we expect the sign of this coefficient to be positive. Second, we introduce an interaction term between a dummy for Brazilian firms and the leverage. We expect this coefficient to have a positive signs, showing that the negative relation between leverage and cash is weakened in the case of Brazilian firms.

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The econometric specification. Hence, so as to analyze the extent to which classical theories allow us to comprehend the recent evolution of cash holdings in Latin American firms, we first estimate a baseline model defined by Equation 3:

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$$Cash\ Ratio_{it} = \beta_0 + \beta_1 Size_{it} + \beta_2 Net\ Cash\ Flow_{it} + \beta_3 Dividends_{it} + \beta_4 Capital\ Expenditures_{it} + \beta_5 Sales\ Growth_{it} + \beta_6 Net\ Working\ Capital_{it} + \beta_7 Leverage_{it} + \beta_8 Short\ Term\ Debt_{it} + \beta_9 Non\ Operative\ Assets_{it} + \beta_{10} Net\ Sales\ Volatility_{it} + \beta_{11} Cash\ Ratio_{it-1} + u_i + e_{it}$$

[Eq. 3]

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Where u_i represents firm i unobserved characteristics, and e_{it} is an independent and identically distributed error term for each firm i and period t . In a subsequent step, we add to this equation the variables corresponding to the exchange rate exposure, macroeconomic effects, and country and sector dummies so as to control for industry and country fixed effects not already captured in the independent variables explicitly included.

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We use a variety of estimation procedures in order to check for the robustness of our results. Firstly, we run a pooled OLS model using standard errors of Newey and West (1987) to control for autocorrelation and, in a second estimation, errors clustered by industrial sector. Next we estimate

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panel models. A between model is displayed in the first place, and then two within estimations are presented, the first with robust Newey and West standard errors, and the second with standard errors clustered by industrial sector. Some sources of endogeneity may affect the OLS estimators. Barros & Silveira (2008) (Barros & Silveira, (2008)) provide a review of simultaneous relations between some of the variables included in Equation 3. There might be, for instance, a simultaneous relation between financial leverage and investment opportunities, such as those captured by capital expenditures and sales growth. Additionally, the capital structure of a firm may influence its payout policy (Fama & French, 2002) (Fama & French, 2002).

To address these sources of endogeneity, we add the lag of the dependent variable as a regressor, which makes the model dynamic in nature, and estimate Equations 3 and 4 using the Generalized Moments Method proposed by (Blundell & Bond, (1998) (Blundell & Bond (1998), also known as system-GMM method. This method is suitable for dynamic models with unobserved heterogeneity and endogeneity. It combines the difference-GMM approach (which applies lagged independent variables as instruments in the levels equations to address endogeneity) with the original equations in levels. This procedure increases the efficiency of the estimators when the series are very persistent. Therefore, their lagged levels are only weakly correlated with subsequent first-differences (Blundell and Bond, 1998) (Blundell & Bond, 1998)). We apply Roodman's (2009) (Roodman's, (2009)) approach to avoid biased estimators resulting from too many instruments. This consists of restricting the lag depth to at most two instead of using all available lags for instruments.

In a subsequent step, we add to this equation the variables corresponding to the exchange rate exposure and macroeconomic effects.

$$\begin{aligned}
 \text{Cash Ratio}_{it} = & \beta_0 + \beta_1 \text{Size}_{it} + \beta_2 \text{Net Cash Flow}_{it} + \beta_3 \text{Dividends}_{it} + \beta_4 \text{Capital Expenditures}_{it} + \\
 & \beta_5 \text{Sales Growth}_{it} + \beta_6 \text{Net Working Capital}_{it} + \beta_7 \text{Leverage}_{it} + \beta_8 \text{ShortTerm Debt}_{it} + \\
 & \beta_9 \text{NonOperative Assets}_{it} + \beta_{10} \text{Net Sales Volatility}_{it} + \\
 & \beta_{11} \text{Cash Ratio}_{it-1} + \beta_{12} \text{ER Operative Exposure} + \beta_{13} \text{ER Balance Sheet Exposure} + \beta_{14} \text{ER} + \\
 & \beta_{15} \text{BOP} + \beta_{16} \text{GDP} + \beta_{17} \text{Interest Rate} + u_i + e_{it} \quad [\text{Eq. 4}]
 \end{aligned}$$

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We use a Wald test for testing whether the new variables add enough precision to our estimates. Finally, we include interaction terms to highlight the role played by the Brazilian public development bank credits. These new variables capture the effect that financial constraints and capital structure variables of Equation 3 have on cash ratios, particularly for Brazilian firms.

VI.V. Econometric Results

a. Baseline and extended models

Table 1 displays the econometric results for Equations 3 and 4, and for an additional model including interaction terms for Brazilian firms. All three models pass the second-order serial correlation test. We cannot reject the null hypothesis that the error term is not serially correlated. Most p-values for the Hansen test satisfy the conventional significance levels with an average value of 0.747. The p-values for the difference-in-Hansen tests for the validity of the instruments are also acceptable. The validity of the subsets of instruments is established for all regressions.

The p-values of both Wald tests shown at the end of Columns B and C show that the variables included are jointly statistically significant and add valuable information to the regression. We conclude that the ER exposure and macroeconomic variables, on the one hand, and the interaction terms for Brazilian firms are relevant and worth including in our model.

The coefficients of firm size, the payout ratio and the sales growth hold for all three models and are consistent with the trade-off model. Larger firms and firms distributing more dividends hold lower levels of cash, and firms with higher investment opportunities as signaled by sales growth demand more cash. The net cash flow shows the expected positive sign as well.

Balance sheet variables such as the aggregate and short-term leverage (except when interaction terms for Brazil are included), the non-operating assets and net working capital also seem to confirm predictions made in the trade-off theory. Firms with higher aggregate leverage seem to face less constraints when requesting external finance, and thus need less hedging. However, when more liabilities become due in the short term, firms hold more cash. Non-operating assets and net working capital seem to act as substitutes of cash.

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Finally, the baseline model evaluation shows that more volatility in the operating environment as capture by the sales volatility leads firms to hold more cash.

Although capital expenditures reduce the amount of cash held by firms in our sample, which tends to validate the pecking order theory, an overall interpretation of the results seems to favor the trade-off model.

Regarding the impact of ER exposure, we find the expected effect of operating exposure. The negative coefficient means that firms whose cash flow fall when a depreciation occurs, tend to hedge against this risk by demanding more cash.

The balance sheet exposure, however, shows a statistically significant but opposite from expected sign. That is, firms with balance sheets more vulnerable to ER depreciation tend to demand less cash. This could be signaling a propensity to hedge against this specific risk by using instruments other than cash (Schiozer & Saito, 2009). This result might also obey to the fact that Latin American firms took advantage of the buoyant financial markets to extend the average maturity of their debt (Schmukler & Didier, 2014), lowering the need for short term liquidity.

As regards the impact of macroeconomic factors, as expected, we find that economic growth affected positively the demand for cash, which can obey to higher investment opportunities and cash flows derived from a higher economic activity environment. The ER also produced the expected result, with depreciations leading to higher cash holdings.

The remaining two macroeconomic indicators only show the expected signs when we include the interaction terms for Brazilian firms. In this last model, interest rates reduce the demand for cash, as expected given that they represent part of its opportunity cost. And the balance of payments result also lowers cash, possibly reflecting less ER hedging needs.

Finally, the positive signs of both interaction terms in Column C of Table 2, reveal that the financial constraints effects pushing firms to hold cash are less pervasive for Brazilian firms.

Table 2
The determinants of cash holdings

INDEPENDENT VARIABLES	(A)	(B)	(C)
Log (Total Assets)	-0.00120*** (4.30e-05)	-0.000787*** (6.75e-05)	-0.000356*** (0.000108)
Net Cash Flow to Assets	0.151*** (0.000781)	0.147*** (0.00116)	0.148*** (0.00137)
Dividends to Assets	-0.189*** (0.00116)	-0.197*** (0.00158)	-0.197*** (0.00203)
Capital Formation Gross	-0.196*** (0.00138)	-0.196*** (0.00213)	-0.191*** (0.00196)
Sales Growth	0.0114*** (0.000262)	0.0107*** (0.000273)	0.0107*** (0.000257)
Net Working Capital	-0.0559*** (0.000748)	-0.0547*** (0.00108)	-0.0544*** (0.00140)
Leverage	0.0291*** (0.000978)	0.0190*** (0.00188)	-0.0147*** (0.00247)
Short Term Debt	0.0655*** (0.00200)	0.0663*** (0.00281)	0.0815*** (0.00266)
Non-operative assets	-0.0417*** (0.00121)	-0.0426*** (0.00131)	-0.0534*** (0.00152)
Moving CV Net Sales	0.00345*** (0.000223)	0.00374*** (0.000274)	0.00700*** (0.000526)
Operative FX Exposure		-0.0191*** (0.00125)	-0.0276*** (0.00134)
Balance Sheet FX Exposure		-0.0106*** (0.000475)	-0.0146*** (0.000576)
FX Depreciation		0.0104*** (0.000646)	0.0177*** (0.000744)
Balance of Payments		0.00309*** (0.00108)	-0.00344*** (0.000898)
Economic Growth		0.0198*** (0.000732)	0.0168*** (0.00103)
Active Interest Rate		0.000655***	-0.000540***
L.(Cash Ratio)	0.807*** (0.00139)	0.801*** (0.00113)	0.782*** (0.00212)
Brazil*Log (Total Assets)			0.00221*** (0.000273)
Brazil*Leverage			0.0118*** (0.00384)
Constant	0.0290*** (0.000289)	0.0268*** (0.000918)	0.0396*** (0.00131)
AR (1) p-value	0,0000	0,0000	0,0000
AR (2) p-value	0,621	0,631	0,64
Hansen Test p-value	0,652	0,722	0,826
Wald Test Chi-2		1919,99	1458,58
Wald Test P-Value		0,0000	0,0000
Observations	10.258	9.973	9.973
Number of id_company_code	595	595	595

Table 2 shows the econometric results of Equation 3, Equation 4 and an augmented version of Equation 4. Column A presents the results of the baseline model displayed in Equation 3. Column B shows the coefficients for Equation 4, and Column C, the results of a model where two interaction terms are added to Equation 4. This interaction terms consist of an indicator variable for Brazilian firms, multiplied by the logarithm of assets and the leverage ratio. We use the Blundell a& Bond (1998) estimator to address potential endogeneity issues arising from the inclusion of dividends payout ratio, the financial leverage ratio and short-term leverage as regressors. We limit the total number of lags to be used as instruments to at most 2. Standard error are shown in parenthesis, and significance levels are shown as follows: *** p<0.01, ** p<0.05, * p<0.1. P-values for AR (1), AR (2) tests of autocorrelation of the error term are included, as well as the Hansen test. Finally, in Columns B and C we show the Wald test for the joint significance of the variables added with respect to previous the column.

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Panel A of Table 1 exhibits our initial regression results for the baseline model without exchange rate exposure and macroeconomic effects. Model 1 of Panel A shows the estimates of the pooled OLS with robust standard errors. As previously acknowledged, the size effect has negative and statistically significant coefficient, supporting the optimal demand for cash theory. Hence, when controlling for other determinants of cash holdings, it is no longer the case that growing firms' size leads to holding higher cash ratios. On the contrary, firms seem to hoard cash as a precautionary reserve in the face of financial constraints. Nevertheless, as we contend below, the weak robustness of this result advises against drawing strong conclusions out of it.

As expected, in our baseline model the cash flow presents a positive and significant effect on cash ratios, and the positive sign on capital expenditures seems to further support the trade-off hypothesis, meaning that higher investment drives cash accumulation upwards as a liquidity buffer securing funding in case external financing is not available.

All four balance sheet variables operate as expected. Whereas higher overall leverage ratios lead firms to shrink cash, when short term debt grows, cash tends to be stockpiled in order to avoid liquidity issues. Likewise, net working capital and non-operative operating assets seem to act as substitutes for cash, since they report negative and significant coefficients.

Finally, the operative operating volatility indicator shows a positive sign, confirming that riskier operational environments generate a higher propensity to hoard cash as a precautionary strategy.

Nevertheless, we find a positive and statistically significant effect of dividends, which does not fit any theoretical prediction.

Models 2 to 5 in Panel A of Table 1 present the estimated coefficients for the baseline model using alternative estimation methods. Model 2, shows the estimation results for the model with standard errors clustered by sector, and models 3, 4 and 5 show the between, within with robust standard errors, and within with standard errors clustered by sector estimation, respectively.

A general overview of the coefficients shows that the robustness of the cash flows, dividends and capital expenditures' coefficients is relatively weak, since they only preserve their statistical significance in either one or two out of five models. The opposite is true for the remaining variables, whose statistical significance persists on at least three of the alternative estimations.

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7 Thus, as an initial conclusion, when considering the explanatory power of canonical theories to
8 account for cash holdings of firms from Latin America, we find that the optimal demand for cash
9 provides a proper description of its determinants.
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11 Panel B of Table 1 shows the results of the extended model including the exchange rate exposure
12 measures, the macroeconomic variables and the country and sector effects. We provide three different
13 estimations (models 1 to 3) for the FX exposure measures, since the within estimators cannot be
14 estimated for these variables, given that they are time invariant.
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18 The coefficient of the baseline model's variables remain unchanged, and we can see that the FX
19 operativeoperating exposure measure is statistically significant (though only in model 1) and has the
20 expected negative sign, meaning that firms whose cash flows from operativeoperating activities are
21 negatively affected by foreign exchange depreciation, hold higher levels of cash in order to moderate
22 financial disturbances generated in the midst of a depreciation. Nevertheless, the balance sheet
23 exposure to foreign exchange fluctuations does not seem to exert the expected positive pressure upon
24 cash holdings. Its coefficient is negative but non-significant in all three available estimations.
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▲	Dividends to Assets	- 0.105***	0.117	0.464***	0.00860	0.00473	- 0.162***	0.174**	0.554***	0.0125	0.00864	-
▲	-	(-0.0384)	(0.0990)	(0.0972)	(0.0370)	(0.0421)	(-0.0355)	(0.0637)	(0.0928)	(0.0370)	(0.0437)	-
▲	Capital Formation Gross	- 0.00013**	9.55e-05*	0.000591	-5.24e-05	-5.15e-05	- 3.01e-05	-5.72e-05	-0.00238	-5.84e-05	-5.6e-05*	-
▲	-				(4.79e-05)	(3.03e-05)			(0.00173)	(4.69e-05)	(2.94e-05)	-
▲	-	(-5.48e-05)	(5.33e-05)	(0.00191)	05)	05)	(-4.56e-05)	(3.55e-05)	)	05)	05)	-
▲	Sales Growth	- 1.91e-05	2.25e-05	-0.000675	3.42e-06	3.70e-06	- 4.79e-06	9.53e-06	-0.00120	7.04e-07	1.02e-06	-
▲	-				(1.03e-06)	(1.66e-06)			(0.00091)	(1.03e-06)	(1.65e-06)	-
▲	-	(-1.45e-05)	(1.85e-05)	(0.00105)	05)	05)	(-1.39e-05)	(1.20e-05)	)	05)	05)	-
▲	Net Working Capital	- -0.145***	-0.135**	0.0844***	0.403***	0.416***	- -0.191***	-0.191***	0.139***	-0.413***	-0.427***	-
▲	-	(-0.00933)	(0.0580)	(0.0278)	(0.0434)	(0.0773)	(-0.00974)	(0.0341)	(0.0276)	(0.0438)	(0.0785)	-
▲	-											-
▲	Leverage	- 0.0549***	-0.0575**	-0.0451*	0.083***	0.0759**	- -0.109***	-0.108***	0.087***	-0.083***	-0.0756**	-
▲	-	(-0.0109)	(0.0239)	(0.0244)	(0.0270)	(0.0298)	(-0.0122)	(0.0348)	(0.0225)	(0.0271)	(0.0288)	-
▲	Short Term Debt	- 0.136***	0.128	0.0790*	0.114***	0.102***	- 0.158***	0.155**	0.107***	0.116***	0.103***	-
▲	-	(-0.0174)	(0.0811)	(0.0413)	(0.0272)	(0.0198)	(-0.0168)	(0.0636)	(0.0372)	(0.0269)	(0.0185)	-
▲	Non-operativeoperating	- -	-0.0356	0.0279	-	-0.234**	- -0.123***	-0.121***	-	-0.230***	-0.238**	-

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assets	0.0377***		0.226***		0.079***							
-	(0.00540)	(0.0355)	(0.0239)	(0.0357)	(0.0982)	-	(0.00589)	(0.0316)	(0.0240)	(0.0357)	(0.0988)	-
Moving CV Net Sales	0.0029***	0.0029***	0.0126**	0.000207	0.000209	-	0.0030***	0.0031***	0.0122**	0.000193	0.000195	-
	(0.000310)	(0.000469)		(0.00059)			(0.000475)	(0.000346)	(0.00502)			
-	)	)	(0.00574)	)	(0.00065)	-	)	)	)	(0.00059)	(0.00065)	-
Operative Operating FX												
Exposure	-	-	-	-	-	-	0.0246***	-0.0217	-0.0118	-	-	-
-	-	-	-	-	-	-	(0.00432)	(0.0173)	(0.0126)	-	-	-
Balance Sheet FX												
Exposure	-	-	-	-	-	-	-0.00285	-0.00373	-0.00205	-	-	-
-	-	-	-	-	-	-		(0.00719)				
-	-	-	-	-	-	-	(0.00198)	(0.00838))	-	-	-
FX Depreciation	-	-	-	-	-	-	0.00525	0.00850	0.274	0.00808	0.0105	-
-	-	-	-	-	-	-	(0.0136)	(0.0208)	(0.179)	(0.00926)	(0.0135)	-
										0.0625**	0.0583**	
Balance of Payments	-	-	-	-	-	-	0.0655***	0.0598**	0.543*	*	*	-
-	-	-	-	-	-	-	(0.0227)	(0.0226)	(0.324)	(0.0158)	(0.0160)	-

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Economic Growth	-	-	-	-	-	-	-	-0.0263	-0.0236	-0.0956	-0.00979	-0.00865	-
-	-	-	-	-	-	-	-	(0.0208)	(0.0177)	(0.223)	(0.0145)	(0.0165)	-
Active Interest Rate	-	-	-	-	-	-	-	0.0011***	-0.0012**	-0.0031*	-0.00066*	-0.00065*	-
-	-	-	-	-	-	-	-	(0.000293)	(0.000473)	(0.00158)			-
-	-	-	-	-	-	-	-	)	)	)	(0.00037)	(0.00031)	-
Constant	-	0.207***	0.208***	0.162***	0.251***	0.251***	-	0.164***	0.150***	0.157***	0.258***	0.258***	-
-	-	(0.00651)	(0.0382)	(0.0199)	(0.0268)	(0.0577)	-	(0.00742)	(0.0196)	(0.0348)	(0.0274)	(0.0573)	-
Country fixed effects	-	No	No	No	No	No	-	Yes	Yes	Yes	Yes	Yes	-
Sector fixed effects	-	No	No	No	No	No	-	Yes	Yes	Yes	Yes	Yes	-
Observations	-	12,036	11,507	12,036	12,036	11,507	-	11,728	11,212	11,728	11,728	11,212	-
R-squared	-	0.091	0.091	0.111	0.198	0.209	-	0.306	0.305	0.367	0.206	0.218	-
Number of panel Id	-	-	-	625	625	602	-	-	-	625	625	602	-

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Table 1 shows the results of the econometric model presented in the Data and Methodology section. Panel A presents the results of the baseline model, each column representing different estimation procedures: Model 1 is a standard OLS estimation, Model 2, shows the estimation results for the model with standard errors clustered by sector, and models 3, 4 and 5 show the between, within with robust standard errors, and within with standard errors clustered by sector estimation, respectively. Standard deviations are reported between brackets. *, **, ***, indicate significance at the 10, 5 y 1% level respectively.

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Regarding the impact of macroeconomic factors, two findings stand out. The first higher active rates of interest provoke a reduction of the amount of unprofitable, liquid assets that firms are willing to stockpile. And second, notably, the balance of payment surplus has a positive and significant effect over cash holdings. This comes as a rather counterintuitive result, bearing in mind that the exchange rate appreciation expectations stemming from a surplus balance of payment presumably have an easing effect over firms' financial outlook, and consequently should reduce cash holdings. Nevertheless, the effect of exchange rate fluctuation on cash holdings is already accounted for by the depreciation variable; in addition, the observed opposite effect is consistent with the balance of payment surplus propelling corporate cash flows beyond capital expenditures and operational requirements, just as the capital markets buoyancy led to a capital structure improvement, reducing short term debt for long term liabilities paying lower interest rates, rather than to boosting corporate investment.

Moreover, the observed positive effect of the balance of payments surplus over firms' cash holdings resembles the reserve accumulation behavior of central banks from emerging markets during the past decade. In a sense, this behavior may be pointing to a common macroeconomic precautionary motive for hoarding liquid assets for corporates as well as sovereigns.

b. Explaining the cash holding increase

Does our model provide any help in explaining the observed increase in cash held by Latin American firms? To give an answer to this question we proceed as follows. First, in order obtain an estimated evolution of the cash ratio for the period, we use the regression coefficients from the between model in Panel B of Table 1 (that with the highest R-squared). Figure 7 below shows the joint quarterly evolution of the average actual and estimated cash ratios for the whole sample of firms. It can be seen that the estimated evolution closely tracks the actual average cash ratio observed in the sample.

Now we can investigate which the determinants are explaining such cash holdings upsurge. Table 2 intends to tackle this question by summarizing the average values of the exogenous variables for two sub-periods representing the beginning and end of the time window covered in our sample, namely, 2000 and 2010-2014. We compute the variation of the average values of

Which are the exogenous variables explaining that estimated increase? Column 5 of Table 2 shows the percentage of the total variation in cash holdings explained by the whole model that is attributable to each explanatory variable. Several conclusions arise from Column 5. First, the explanatory power of the baseline model variables when accounting for the observed increase in cash ratios is poor. Indeed, would it be for those variables only, the cash ratios should have decreased slightly rather than increased.

Table 2

The determinants of Latin American firms increase in cash ratio

	Between Coefficients	Average 2000	Average 2010-2014	Explained Variation	Percentage Explained
Cash Ratio		6,0%	10,3%		
Log (Total Assets)	0,00	4	8,35	pp	2%
Net Cash Flow to Assets	-0,11	4	0,04	pp	1%
Dividends to Assets	0,55	2	0,03	pp	19%
Capital Formation Gross	0,00	3	0,01	pp	0%
Sales Growth	0,00	7	0,13	pp	0%
Net Working Capital	-0,14	9	0,28	0,09 pp	3%

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			0,4				
Leverage	-0,09	9	0,51	-0,16 pp	-5%	Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
			0,2				
Short Term Debt	0,11	7	0,25	-0,19 pp	-6%	Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
			0,1				
Non-operative assets	-0,08	7	0,23	-0,50 pp	-17%	Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
			0,2	0,01			
Moving CV Net Sales	0,01	1	0,21	pp	-0%	Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
Operative FX Exposure	-0,01	-0,04	0,03	-0,09 pp	-3%	Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
			0,1	0,00			
Balance Sheet FX Exposure	0,00	0	0,11	pp	-0%	Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
			0,0	0,07			
FX Depreciation	0,27	1	0,01	pp	-2%	Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
				1,12			
Balance of Payments	0,54	-0,01	0,01	pp	-38%	Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
			0,0				
Economic Growth	-0,10	1	0,02	-0,10 pp	-3%	Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
				2,09			
Active Interest Rate	0,00	13,89	7,11	pp	-70%	Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
				4,32			
Total Variation of the Cash Ratio				pp		Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
Total Explained Variation of the				2,99		Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
Cash Ratio				pp		Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double
Percentage Explained					69%	Formatted: Font: Times New Roman, 11 pt, English (U.S.)	Formatted: Line spacing: Double

Table 2 shows the determinants of the increase in cash ratio of the average firm in the sample. The first

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column provides the coefficients of the Between model obtained in Panel B of Table 1. The second column presents the average values of the cash ratio and all independent variables of the model during year 2000. The third column presents the average values for the period 2010-2014. The fourth column shows the variation of the cash ratio explained by each independent variable, as a result of multiplying the regression coefficient of the first column times the variation of each independent variable between both periods. The fifth column shows the percentage of total cash ratio variation explained by each independent variable. Total actual variation of cash ratio, total explained variation as well as the percentage of the total variation explained by the model are reported in the last three lines.

Second, the only variable from the baseline model generating a substantial contribution to the increase in cash ratios is the payout ratio, whose regression coefficient, as noted above, has a sign opposite to expected (positive rather than negative). This means that, during the analyzed period firms with higher payout ratios experienced also sharper increases in cash ratios, pointing to investable funds at once flying away from capital expenditures through different channels: dividend payout and cash accumulation. Third, macroeconomic variables made the largest contribution to the increase in cash ratios, with the interest rate decrease and the balance of payment enlargement driving most of the cash ratios expansion.

VII-VI. Summary and Discussion

We document an increasing trend for cash holdings in non-financial firms from Latin America, at least since 2000. This increase proceeded steadily until 2010, when cash holdings stabilized at a significantly higher level, continued growing at a slower pace, or decreased slightly depending on the country. The increase in cash holdings comes as an intriguing fact, given that it occurred in the middle of an economic growth phase surrounded by booming international conditions as regards export prices and capital inflows to the region, presumably providing a broad array of investment opportunities.

We find strong evidence supporting the trade-off theory. This suggests that cash holdings were accumulated mainly for precautionary motives to hedge against potential financial constraints.

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6 Additionally, Latin American firms seem to experience additional motives for holding cash
7 related to currency risks. Specifically, we find that hedging against exchange rate risks affecting
8 the operational cash flows is a statistically relevant motive. We show that this pattern is pervasive
9 and holds true for firms from different countries and sectors, but manifests itself more acutely in
10 Brazilian and Chilean firms. By the same token, we find that net leverage and short term debt
11 show a fairly declining trend over the full period mainly due to the increase in corporate cash
12 holdings.
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14
15 We conduct a survey of the literature which deals with the cash holdings increase in
16 advanced economies, and outline two major explanations for cash holdings: the trade off,
17 optimal demand for cash, and the pecking order theory. Besides, we propose a specific
18 explanation for cash accumulation in emerging markets, through the exchange rate exposure
19 channel.
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22 ve. Our evidence does not confirm that hedging against balance sheet currency mismatch
23 plays the expected role for demanding cash.
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26 The macroeconomic environment exerts relevant effects on firms' demand for cash.
27 Importantly, during our sample period aggregate economic growth seems to increase the
28 demand for cash, as well as exchange rate depreciation.
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31 Finally, the easing of financial conditions provoked by development banking credit in
32 Brazil through BNADES, also seem to weaken the financial constraints motive for demanding
33 cash in Brazilian firms.
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36 Although some preliminary evidence points to results opposite from expected, our
37 econometric analysis suggest that the theoretical predictions are empirically validated. As a
38 result, we show that firm size exert a negative effect over cash holdings, higher cash flows and
39 capital expenditures increase cash demand, meaning that higher investment opportunities drive
40 cash accumulation upwards. Overall, we conclude that the trade-off model for cash provides a
41 proper description of its determinants. Nevertheless, we find a positive effect of dividends over
42 cash holdings, which doesn't fit any theoretical prediction.
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Regarding the impact of macroeconomic factors, we provide evidence showing that operativeoperating exposure to exchange rate depreciation pushes cash holdings upwards.

In addition, two findings stand out. Firstly, active rates of interest reduce the amount of liquid assets that firms are willing to stockpile. And second, the balance of payment surplus has a positive and significant effect over cash holdings.

When trying to identify the main determinants of the cash ratio upsurge over the period analyzed, we find that the variables from the baseline model provide no contribution to the increase. Instead, the main drivers are the dividends paid, the interest rate and the balance of payments surplus.

The positive impact of balance of payments surplus on firms' cash holdings is a rather perplexing fact, given that we would have expected the opposite effect. However, a broader perspective shows that this behavior was also featured by the central banks of the region, mainly as a precautionary procedure against future drop-off in the foreign capital and commercial inflows. The specifics of this shared hedging strategy against a common macroeconomic risk remain unexplored and are part of our future research agenda.

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5 Dear Artica:
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8 19-Oct-2017
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10 Prezado Autor,
11

12 O seu artigo ID RCF-2017-0566, intitulado "Why do Latin American firms hold so much more
13 cash than they used to?", foi avaliado por pares e considerado para prosseguir devido ao potencial
14 apresentado. Os revisores sugeriram alterações que requerem dedicação e, dessa maneira,
15 convidamos a submeter uma nova versão do artigo. Se estiver de acordo, aguardamos a nova versão
16 até The author due date is unavailable.
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18
19 A nova versão do artigo deverá ser enviada em duas partes: uma contendo a versão com as marcas
20 das alterações efetuadas e a outra sem as marcas das alterações. Você deverá também enviar um
21 relatório comentando cada recomendação dos revisores, detalhando cada ponto levantado e
22 comentando a aceitação ou justificando a não aceitação do que foi solicitado.
23

24 Aproveitamos para dizer que é importante revisar o seu artigo de acordo com as diretrizes da
25 Revista, como, por exemplo, não exceder o número de páginas (32 páginas para artigos e 15 páginas
26 para ensaio), não utilizar notas de rodapé e revisar a norma APA para padronizar as citações e
27 referências. É importante lembrar também que no caso de citação de textos originários de tese ou
28 dissertação, esperamos que a citação venha do artigo dele decorrente, publicado em algum
29 periódico.
30

31
32 Acesse o link <https://mc04.manuscriptcentral.com/rcf-scielo> e clique em Author Center, você
33 encontrará o título do artigo listado sob "Manuscripts with Decisions". No item "Actions", clique
34 em "Create a Revision". Seu número de ID estará indicado no rodapé para viabilizar a revisão.
35

36 Para fazer o upload da nova versão no sistema ScholarOne, EXCLUA a versão anterior do artigo e
37 carregue os documentos principais (com e sem marcas) como "Main Document" e o relatório
38 como "Supplemental file for review".
39

40 O link abaixo possibilita o acesso direto ao artigo para efetuar as alterações, ou continuar o
41 processo, caso já tenha sido iniciado:
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43 *** PLEASE NOTE: This is a two-step process. After clicking on the link, you will be directed to a
44 webpage to confirm. ***
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47 [scielo?URL_MASK=e394f684f8be4ae7b1cb38afa3375e46.](https://mc04.manuscriptcentral.com/rcf-scielo?URL_MASK=e394f684f8be4ae7b1cb38afa3375e46)
48

49 Na expectativa de receber novas submissões, agradeço-lhe por considerar a Revista Contabilidade
50 & Finanças como um espaço para a divulgação do(s) seu(s) trabalho(s) de pesquisa.
51

52 Atenciosamente,
53 Fábio Frezatti.
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55 Editor-Chefe
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6 Comentários dos revisores:
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10 Reviewer: 1
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12
13 1. O artigo

14 O artigo em análise teve por objetivo investigar as causas do aumento do nível de caixa mantido
15 pelas empresas não-financeiras da América Latina (Argentina, Brasil, Chile, México e Peru). Para
16 isso, fez uso do OLS com erros padrão robusto de Newey-West, bem como agrupados por setor,
17 além de dados em painel. Como resultados principais, observaram um aumento no nível de caixa
18 das empresas no período analisado, sendo persistente em nível de país e setor. Ademais, a análise
19 econométrica sugere que as previsões teóricas foram empiricamente comprovadas. Por fim,
20 observaram que os principais determinantes do nível de caixa das empresas estavam relacionados a
21 variáveis macroeconômicas.
22

23
24 2. Pontos Fortes e Fracos

25
26 Pontos Fortes

27 Trata-se de um trabalho coeso e com estrutura interna adequada. Pesquisas abordando aspectos de
28 finanças de curto prazo, tal como o nível de caixa das empresas, tem sido ignoradas no Brasil.
29 Assim, pesquisas abordando esses aspectos são sempre bem vindas. Ademais, destaca-se o uso de
30 uma amostra abrangente, seguindo pesquisas internacionais recentes, e com um número
31 considerável de observações, bem como a qualidade dos dados utilizados.
32

33
34
35 Pontos Fracos

- 36 • Atualidade da revisão da literatura;

37 We improved the literature review including more updated research and papers from leading
38 finance journals such as The Journal of Finance, Financial Economics Studies, Review of Financial
39 Economics, Journal of Financial Economics, etc.
40

- 41 • Método econométrico.

42 Taking into account Referee 1's comments, we adjusted the econometric method, using a system-
43 GMM as proposed by Blundell and Bond (1998).
44

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48 3. Comentários Gerais

49 Em resumo, os autores procuraram explorar as causas do aumento do nível de caixa mantido pelas
50 empresas latino-americanas. Trata-se de uma amostra abrangente e representativa e com um
51 número considerável de observações, dadas as restrições dos mercados latino americanos, bem
52 como oriundos de uma base de dados usados nas principais pesquisas internacionais (Compustat).
53 Em geral, o artigo encontra-se bem estruturado, com uma boa revisão da literatura, boa disposição
54 dos resultados e com um bom grau de maturidade, embora careça de algumas alterações, tais como
55 as listadas a seguir.
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1. Na introdução, os autores trazem pesquisas que também analisaram a questão da manutenção do saldo de caixa pelas empresas, principalmente em países desenvolvidos. O que o artigo traz de novo, nesse caso? De que forma o trabalho se diferencia desses estudos? Qual a real contribuição? Qual a peculiaridade dos países latino-americanos? Quais os motivos para pensar que, na América Latina, as razões para manter caixa pelas empresas sejam diferentes? Da forma com que está escrita, parece-me que as demais pesquisas já fizeram o que os autores pretendem fazer, sugerindo ser apenas uma replicação de trabalhos anteriores em um mercado diferente. Dessa forma, o artigo teria que apresentar de forma mais clara a relevância de sua contribuição, tanto na introdução quanto na conclusão.

We made an effort to highlight the main contributions of the article. First, we document the positive trend for cash holdings among Latin American firms. Second, we assess whether the trade-off or the pecking order theories fit our data, and thus which of those theories offer a better explanation for our findings in Latin America. Third, we put forward and test empirically an additional and complimentary explanation of cash holdings build-up in Latin America. This has to do with key macroeconomic variables such as exchange rate risks, the external balance of payments and economic growth.

2. Na revisão da literatura, observa-se uma literatura defasada (apenas 1 paper recente) e com baixo número de artigos publicados em top journals. Recomendo utilizar (bem como aumentar a proporção de) artigos publicados em periódicos de alto impacto, com a maior parte deles recente (últimos 3 anos). Além disso, os autores não evidenciam de forma clara sua contribuição marginal à literatura nacional ou internacional sobre o tema. Falham, essencialmente, em apresentar uma revisão da literatura, mostrando o que seu trabalho difere de outros autores, o que se assemelha e o que seus resultados resultam em novo conhecimento.

We improved the literature review including more updated research and papers from leading finance journals such as The Journal of Finance, Financial Economics Studies, Review of Financial Economics, Journal of Financial Economics, etc.

As we claim above, the new version highlights more strongly the contributions of the article.

3. Ainda na revisão da literatura, os autores fundamentam o nível de caixa mantido pelas empresas, basicamente, em duas teorias: trade-off e pecking order. Os autores precisam fundamentar melhor os resultados obtidos (e esperados), conforme cada teoria. Além disso, tentar evidenciar se os resultados obtidos alteram de alguma forma essas teorias. Fazendo isso, os autores poderão ser capazes de melhorar um ponto importante do artigo: a contribuição teórica (quais os avanços teóricos?).

We improved the presentation of both main theories used to explain cash holdings. Theoretical relations are now supported by more precise references to the literature. Besides, we made more explicit the theoretically expected results regarding each factor and variable included in our empirical exercise. When we find opposite from expected results in the econometric exercise, we provide a discussion of the possible causes.

4. O Método econométrico utilizado é inadequado. A estimação do modelo apresentado no artigo não leva em consideração explicitamente a endogeneidade, podendo prejudicar o real

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3 relacionamento entre as variáveis. A literatura de Finanças sugere uma relação de causalidade de
4 mão-dupla entre endividamento e alguns indicadores corporativos (BARROS; SILVEIRA, 2008).
5 Por exemplo, o valor de mercado, como uma proxy para oportunidades futuras de investimento
6 disponível, pode influenciar contemporaneamente o financiamento das empresas, assim como a
7 alavancagem pode influenciar a política de distribuição de dividendos (FAMA; FRENCH, 2002).
8 Portanto, pode haver relação simultânea entre os indicadores corporativos utilizados na Equação
9 (deveria estar numerada) constante na página 23. Observa-se, ainda, a variável endividamento sendo
10 usada como variável dependente (página 6) e independente (Equação página 23). Veja, ainda, a
11 variável índice de caixa (variável dependente) e fluxo de caixa líquido (variável independente). Nesse
12 caso, não estaria uma variável dentro da outra? Faz sentido? Dessa forma, tendo em vista essa
13 relação simultânea, bem como outras fontes de endogeneidade, recomenda-se utilizar métodos
14 econométricos que considere a endogeneidade, tais como o Método dos Momentos Generalizados
15 (GMM), diff-in-diff, dentre outros.

16
17
18 Taking into account these comments we changed the econometric method. We now apply the
19 system-GMM estimator proposed by Blundell & Bond (1998).

20
21 Regarding the comment about net leverage being a dependent variable in page 6, we would like to
22 clarify that this is only for the sake of illustrating the relevance of the average pace of net leverage
23 decline. We could delete comments referring to these regressions if the Referees or Editors suggest
24 it.

25
26 As regards the potential source of endogeneity between net cash flow and cash holdings we refer to
27 the popular contribution of Almeida, Acharya and Campello (2004). In this study, the authors study
28 the propensity of firms to save cash out of cash holdings. They find a positive relation between
29 cash flows and cash holdings only for financially constrained firms. Unconstrained firms do not
30 show any systematical relation between cash flows and cash holdings. This is further developed by
31 Acharya, Campello and Weisbach (2007).

32
33
34 5. Ainda na metodologia, deixa claro o período amostral. Esse período aparece em diferentes
35 partes do texto, mas deveria ser posto de forma mais clara na metodologia, facilitando o
36 entendimento do leitor (que precisa procurar o referido período). Além disso, a proxy utilizada para
37 tamanho é questionável (ativo total). Por que não usar valor de mercado como proxy, comumente
38 utilizada na literatura?

39
40 We now explicitly include the sample period in the Data and Methodology section.

41
42 The measure we use for firm size is one widely used and accepted in the literature of cash holdings.
43 See, for instance, Bates, Kahle & Stulz (2009), Opler, Pinkowitz and Williamson (2016).

44
45 We cannot include the market value because it is not available in the dataset we use, for the
46 countries analyzed in our study.

47
48 6. Particularmente no Brasil, existem os juros subsidiados nos financiamentos via BNDES. Isso
49 mudaria em alguma medida sua análise? Será que o fato de a empresa ter acesso a financiamento via
50 BNDES poderia moderar a relação entre endividamento e nível de caixa? Uma variável de interação
51 captaria isso?

52
53 We take this into account and include two interaction terms to capture the effects of the
54 development banking credits available for Brazilian firms. The expected results are discussed in the
55 theoretical section.

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57 7. Deixar mais clara a forma de mensuração das variáveis Operative FX Exposure e Balance
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3 Sheet FX Exposure. São dummies? Não deveria haver ambiguidade na metodologia, principalmente
4 nessas variáveis, uma vez que se trata da parte mais importante do paper (possivelmente, o
5 diferencial do paper reside nessas variáveis).

6
7 We made an effort to clarify as much as possible how we build our measures of Exchange rate
8 exposure. We include one equation for each measure of ER exposure.

9
10 8. Inserir o teste de estacionariedade das variáveis, principalmente das macroeconômicas.

11
12 In Table 1 of the new version of the article, we include the Levin, Lin, Chu (2002) for panel unit
13 roots in order to test the presence of unit root for the macroeconomic variables included in the
14 model. We reject the hypothesis of unit root process, and confirm that all variables are stationary
15 around a deterministic trend.

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18 9. Na análise dos dados, são observados resultados contrários aos esperados. Por exemplo, a
19 relação entre tamanho e nível de caixa, e entre dividendos e nível de caixa foi contrário ao que se
20 esperava. Faz sentido os resultados observados? Quais as razões para os sinais contrários
21 observados? Muitos dos efeitos preditos pelas teorias padrão não são observados pelas empresas
22 latino-americanas. Quais as possíveis causas para isso? Os autores devem buscar explicações para os
23 resultados contraditórios.

24
25 The new results emerging from the Blundel – Bond estimators show the expected coefficient signs
26 for firm size and dividends payout ratio. This is a result robust to including macroeconomic and
27 exchange rate exposure variables.

28
29 When we find results opposite to expected, we discuss it and provide possible explanations
30 supported in the literature. This is the case, in particular, regarding the effects of balance sheet
31 exposure to exchange rate risk.

32
33
34 10. Os autores utilizam cinco métodos distintos para estimar os parâmetros da Equação da
35 página 23. Estimar os parâmetros por cinco métodos diferentes apenas dificulta a retirada de
36 conclusões dos resultados. Qual o modelo que melhor se ajusta aos dados? Talvez, utilizar o
37 modelo que melhor se ajustou aos dados proporcione melhores conclusões (inferências). Da forma
38 como está, apenas dificulta o entendimento. Qual o sentido, para fins de inferência, saber que a
39 variável foi significativa por um método e não por outro? Assim, a análise dos dados obtida é
40 confusa, pois o autor, ao não fazer uma escolha pelo modelo que mais se ajustou aos dados, torna a
41 compreensão das análises, no mínimo, ambígua. Ademais, vide as observações feita no item 4,
42 quanto aos métodos econométricos utilizados. Diante do exposto, as análises são confusas, com
43 alternâncias de modelos e resultados. Logo, não se tem evidências suficientes e satisfatórias para as
44 conclusões evidenciadas no texto.

45
46 We restrict the number of models to only three. And preserve the same Blundell-Bond estimator in
47 all of them. As we discuss in the Results section, most coefficients are robust to including
48 additional variables. When this is not the case, we clarify that we consider the results of the largest
49 model.

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51
52 11. Acho falha a comparação dos resultados pelo R2. Sugiro utilizar o teste F para comparar os
53 modelos (via teste de wald), partindo de um modelo irrestrito e analisando se as variáveis
54 acrescentadas ao modelo base (principalmente as macroeconômicas) melhora seu poder explicativo.

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3 This makes perfect sense. We include Wald Tests p-values in the Table showing the Regressions
4 results. They confirm that the macroeconomic variables are jointly significant and add valuable
5 information to the model.
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9 12. A análise do item b, na página 28, fica comprometida, em função das observações feitas
10 quanto aos métodos econométricos utilizados (item 4 deste parecer).
11

12 For the sake of brevity, we removed this section from the new version of the paper.

13 13. Por fim, na conclusão, sugiro que os autores concentrem na contribuição teórica e empírica
14 (prática) do paper, evidenciando, principalmente, a contribuição do artigo e os avanços alcançados
15 por meio dos resultados obtidos. Simplesmente repetir o que já foi dito na análise dos dados, torna
16 a conclusão pobre e com alcance limitado.
17

18 We edited the previous version to preserve only the main results and contributions.
19

20
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22 4. Outros Comentários (problemas menores)
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25
26 14. O resumo apresenta erros básicos de português, demonstrando problemas de tradução. Da
27 mesma forma, observa-se, no abstract, a manutenção de texto em português, evidenciando
28 descuido na redação do texto.
29

30 We edited the portugues abstract to correct its errors.
31

32 15. O descuido na redação do texto se agrava ainda mais, ao se observar textos mantidos em
33 espanhol no artigo. Vide, por exemplo, a Tabela 1, painel B, na página 26 e o último parágrafo da
34 página 29.
35

36
37 16. Na nota de rodapé da Tabela 2, veja “averga value” (average?).
38

39 This table was removed.
40

41 17. Na página 8, cita-se Manuelito e Jimenex (2015) e Perez Artica, Delbianco e Brufman (2016)
42 no texto, contudo, nas referências, consta Manuelito e Jimenex (2013) e Perez Artica, Delbianco e
43 Brufman (2017). Assim, questiona-se: seria 2013 ou 2015? 2016 ou 2017?
44

45 We checked the references and Bibliography list by using a reference software.
46

47 18. Sugiro numerar todos as Equações do paper. Ademais, recomendo escrever de maneira
48 formal a Equação da página 23. Ficou faltando o termo de erro, afinal trata-se de um modelo
49 probabilístico e não determinístico.
50

51 We enumerated all the equations in the article.
52

53 5. Referências
54

55 BARROS, L. A. B. de C.; SILVEIRA, A. D. M. da. Excesso de Confiança, Otimismo Gerencial e
56 os Determinantes da Estrutura de Capital. Revista Brasileira de Finanças, v. 6, p. 293-335, 2008.

57 FAMA, E. F.; FRENCH, K.R. Testing Trade-Off and Pecking Order Predictions About Dividends
58 and Debt. The Review of Financial Studies, v.15, n.1, 2002.
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4 Reviewer: 2

5 Positive Points:

6
7 Relevant and actual theme. Results that are well explored in the text. Good use of quantitative
8 methodology.
9

10 Negative points:

11
12 The portuguese abstract needs a good review.

13 We edited the portugues abstract to correct its errors
14

15
16
17 The research problem is not very well sustained in the theoretical financial and empirical
18 bibliography.
19

20 We improved the literature review including more updated research and papers from leading
21 finance journals such as The Journal of Finance, Financial Economics Studies, Review of Financial
22 Economics, Journal of Financial Economics, etc.
23

24
25
26 Where is the Figure 4? The authors jump from Figure 3 to 5 in the paper.
27 We corrected this error.
28

29 There are not substantial justification/explanation about the explicative variables from the models
30 in the methodology. It should be alligned with empirical papers that was done before about this
31 theme of research.
32

33 We improved the presentation of both main theories used to explain cash holdings. Theoretical
34 relations are now supported by more precise references to the literature. Besides, we made more
35 explicit the theoretically expected results regarding each factor and variable included in our
36 empirical exercise. When we find opposite from expected results in the econometric exercise, we
37 provide a discussion of the possible causes.
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