

Research Plan for PhD Dissertation

The Determinants of Corporate Cash Holdings in Brazil

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I. Introduction

How the decisions on the level of cash holdings are taken by firms? Are the cash holdings managed by active or passive management policies? Kim et al. (1998) and Opler et al. (1999) addressed these issues in the USA, and others have conducted similar researches in UK, Netherlands, Belgium, Japan, Germany and many other countries, analyzed individually or collectively. The present research for the PhD dissertation at Fundação Getúlio Vargas – EAESP aims to address the similar issues in Brazil, analyzing the determinants of corporate cash holdings.

There are two main views related to the corporate cash holdings: the trade-off view and the financing hierarchy view. The results of preliminary empirical tests indicate that the corporate cash holdings in Brazil are managed more passively than actively, following more the financing hierarchy view than the trade-off view, in contrast to the findings in the USA reported in the previous papers, which support more the trade-off view. Nevertheless, there is evidence that the higher the financial leverage, the higher the cash holdings by the firms, indicating trade-off based decisions when the firms have debts, which can be explained by the cash buffers for the transaction and the precaution motives as well as by the extra cash holdings for the arbitrage transactions. These results are, therefore, indications that the Brazilian firms manage their cash holdings less efficiently than the US firms, in spite of the lower availability of financial resources in Brazil than the USA.

The objective of the research is to conduct further investigation on the determinants of corporate cash holdings in Brazil, seeking to discover the reason by which each relevant determinant affects the corporate cash holdings as well as the reasons of the differences between Brazilian and US firms.

II. Literature Review

Under the hypothetical perfect financial markets, the cash holdings are irrelevant, since firms are able to get funds with no friction whenever need them. Under the real conditions, however, there are several financial market imperfections which make the cash holdings relevant.

The corporate cash holdings in the real market conditions can be analyzed under two views: the trade-off view and the financing hierarchy view.

(1) Trade-Off View on Cash Holdings

Cash holdings may be actively managed by trade-off between their costs and benefits. By equaling the marginal costs to marginal benefits of holding cash, the decision leads to optimal levels of cash holdings, consistent with the shareholder value maximization objective.

The benefits of cash holdings can be analyzed in terms of the transaction, the precaution and the speculation motives, stated by Keynes (1936), and the arbitrage motive, valid specifically in Brazil.

Transaction motive: If a firm becomes short in cash, it cannot meet payment needs. To get funds from outside source, it is necessary to sell assets the firm has or access capital markets; however, these transactions incur in costs. In order not to be short in cash and incur in these transaction costs firms hold cash and, in this sense, firms with higher marginal cost of cash shortfalls hold more cash as stated by classic Miller and Orr (1966). In addition, there are the effects of information asymmetry and agency costs of debt, which make the financing from the external sources harder and more costly.

Precaution motive: Firms need to keep liquidity for precaution due to the occurrence of unexpected payment needs. In particular, in an instable economic environment such as of Brazil, the cash holdings for precaution may have higher importance.

The transaction and the precaution motives are related each other. Firms with debt financings may seek cash buffers for the transaction and the precaution motives, preparing themselves for eventual financial markets' turbulence, during which they face difficulties in rolling over the debts. These buffers may include the investments with hedge purposes to protect themselves against the foreign exchange risk of the foreign currency denominated debts. Moreover, due to the agency costs of managerial discretion, managers may decide to hold more cash than the actual needs, seeking lower risk for their personal comfort and benefits and to increase their discretion.

Speculation motive: Firms may keep cash in order not to be short in cash when find out opportunistic investment alternatives and be able to make investments. Hence, the firms with higher business opportunities or capital investments, frequently by acquisition of other companies, hold cash based on the speculation motive.

Arbitrage motive: Some firms in Brazil have kept cash invested in the domestic financial markets taking advantage of arbitrage opportunities. These transactions consist of obtaining funds from the foreign financial markets at a low interest rate, commonly by using trade facilities, and investing them in the domestic markets at a higher interest rate, usually hedged against foreign exchange risk.

On the other hand, there are basically two types of costs of cash holdings: the opportunity cost of capital and the liquidity premium.

Opportunity cost of capital: Cash holdings have their costs of capital as any other investments by firms. These costs of capital include the premiums for default risk of treasury bills and inflation risk.

Exposure to the default risk of treasury bills: The Brazilian government securities are not risk free as in the USA. Actually they are regarded as considerably risky due to the public deficit and debt in Brazil.

Exposure to the inflation risk: Inflation causes the real return in cash holdings to be negative from time to time.

Liquidity premium: The holders of liquid assets incur in a premium equal to the difference in returns from these assets and less liquid assets, in which the funds may also be invested. This is an additional price to be paid for the preference given to the liquidity.

The equilibrium between the benefits and costs leads to optimal cash holdings. The higher the benefits and lower the costs, the higher the cash holdings by firms.

(2) Financing Hierarchy View on Cash Holdings

At examining the applicability of trade-off view, Opler et al. (1999) also present an alternative view that cash holdings may be a result of the financing hierarchy or pecking order financing as described by Myers (1984) and Myers and Majluf (1984). In other words, cash holdings may be passively managed.

By the financial hierarchy, a firm meets its financial needs firstly by internal source, secondly by debts and finally by issuing new equities, due to progressively increasing transaction costs. Hence, the cash holdings are a result of the internal generation of cash and, when the cash availability is not sufficient, the firm turns to external sources, first by debt and, then, by equity.

(3) Empirical Studies

The empirical literature on the determinants of corporate cash holdings has basically analyzed the applicability of specific determinants and their effects, e.g., whether they increase or decrease the corporate cash holdings, interpreting them under either the trade-off view or the financing hierarchy view.

John (1993) analyzed the relation between the liquidity of firms and the financial leverage and bankruptcy costs applying linear regressions on panel data of 223 US firms for the period from 1979 to 1981. The author found evidences that the liquidity ratios are positively related to the bankruptcy costs, but negatively related to the financial leverage, cash cycle and value of fixed assets used as guarantee to the contracted debts.

Kim et al. (1998) analyzed 915 US firms for the period from 1975 to 1994 and found evidences more in favor of the trade-off view of corporate cash holdings than the financing hierarchy view. Their results indicated that the corporate cash holdings

are positively related to the costs of external financing, measured by the firm size and growth opportunities (market to book value ratio).

Opler et al. (1999) analyzed US firms for the period of 1971 to 1994 and also found evidences more in favor of the trade-off view than the financing hierarchy view. Their results indicated that the corporate cash holdings are negatively related to the size and the net working capital, but positively related to the growth opportunities, operating cash flow, risk of cash flow, capital investments and investments in fixed assets.

Pinkowitz and Williamson (1999) analyzed the corporate cash holdings in Japan and Germany for the period from 1974 to 1995, comparing them with the USA. Their results indicated that Japanese firms hold significantly higher cash than US firms due to the traditional relationship between firms and banks in which firms cannot repay the debts back to the banks even they hold cash, letting the banks extract rents from the firms in Japan.

Anderson (2002) analyzed firms in UK and Belgium and found evidences that the corporate cash holdings are positively related to the long-term debt financings for the precaution motive in UK.

Ozkan and Ozkan (2001) analyzed 1029 firms in UK for the period from 1984 to 1999, focusing on the agency costs of managerial discretion. Their results indicated that the capital participation by managers make the UK firms hold higher cashes.

In Brazil, Falls and Natke (1996) and Natke (2001), considering the data for manufacturing firms from 1973 to 1976, reported the findings that local firms had high cash holdings due to uncertainties of high inflationary economy, whereas multinational firms' local subsidiaries did not, as these firms could get parent companies' financial supports.

Gomes and Leal (2000) studied the determinants of capital structure by public companies and found evidences of the pecking order financing in Brazil. Lucinda and Saito (2002), on the other hand, analyzed the determinants of long-term financings and found evidences more in favor of the optimal capital structure decisions than the pecking order financing in Brazil.

Dittmar et al. (2002) analyzed the relation between the cash holdings and shareholder protection system in 45 countries. They found evidences that in the countries with lower shareholder protection and easier access to the capital markets, the cash holdings are higher. On the other hand, Mickelson and Partch (2002) found no evidence of the effects of ownership structure over the cash holdings.

The passive financing hierarchy and the active trade-off between benefits and costs may not totally be seen as opposing views. Bruinshoofd and Kool (2002), for example, presented a model in which the firms adopt passive cash holding policies in the short run, while actively seek cash holding targets in the long run, finding evidences from the analyses of 473 firms in the Netherlands for the period from 1986 to 1997.

III. Methodology and Data Sources

The determinants of corporate cash holdings and the applicability of the two views on the subject can be analyzed in terms of the relations between the cash holdings and other microeconomic variables.

Some of these variables are specified in the table below.

Variable Definitions for Regression Analysis

Variable:	Definition:
Cash	Cash / (Total assets – Cash)
Size	Total assets deflated by IGP-DI consumer price index
Operational profits	Operating profits / (Total assets – Cash)
Standard-deviation of operational profits	Standard-deviation of operational profits
Receivables	Commercial receivables / (Total assets – Cash)
Inventories	Inventories / (Total assets – Cash)
Suppliers	Suppliers / (Total assets – Cash)
Total debt	Total debt / (Total assets – Cash)
Net debt	Net debt / (Total assets – Cash)
Short-term bank loans	Short-term bank loans / (Total assets – Cash)
Short-term corporate bonds	Short-term corporate bonds / (Total assets – Cash)
Long-term bank loans	Long-term bank loans / (Total assets – Cash)
Long-term corporate bonds	Long-term corporate bonds / (Total assets – Cash)
Capital investments	Variation in capital investments / (Total assets – Cash)
Investments in fixed assets	Variation in investments in fixed assets / (Total assets – Cash)
Growth opportunities	(Total assets - book value + market value) / (Total assets)
Dummy variable for dividends	One if paid out or zero if did not pay out dividends

The methodology to test the determinants will be the linear regressions on panel data, with the cash holdings as dependent variable and the potential determinants as independent variables. The signs of the coefficients obtained by regressions will indicate the relations between the cash holdings and the analyzed determinants.

It will be utilized the Ordinary Least Square, Generalized Least Square, Fixed Effects, Random Effects as well as the methods of instrumental variables, such as the method of Arellano and Bond (1991), for the comparison purposes.

The data will be obtained from the sources listed below:

- Compustat Global
- Económica (a private data bank)
- CVM – Brazilian Security Exchange Commission
- SND – Brazilian Domestic Corporate Bond System
- BOVESPA-FIX – Brazilian Corporate Fixed Income Security Exchange
- Central Bank of Brazil
- Financial statements of financial institutions

IV. Preliminary Tests

Preliminary tests were conducted using data obtained from Economática. It was collected the quarterly accounting data for the companies listed on BOVESPA, from the third quarter 1994 to the fourth quarter 2002, including the firms with status of canceled stocks in April 2003. It was excluded the firms in finance and insurance industry from the sample, resulting in panel data formed by the cross-sectional data for 396 companies and time series of 34 quarters. It was applied the OLS, GLS, Fixed Effects and Random Effects regression methods for this preliminary analysis.

The overall results indicate the prevalence of the financing hierarchy view over the trade-off view on the corporate cash holdings in Brazil:

- 1) The sign for the size is positive, showing that the greater the size, the higher the cash holdings.
- 2) The sign for the operational profits is also positive, indicating that the greater the operational profits, the higher the cash holdings.
- 3) The sign for the inventories is positive, indicating that the higher the inventories, the higher the cash holdings, e.g., the inventories are not good substitutes to the cash holdings.
- 4) The sign for the investments in fixed assets is negative, showing that the greater the investments, the lower the cash holdings. It is also observed that the coefficient for the capital investments is practically zero, indicating that its effect on the cash holdings is negligible.
- 5) The sign for the dividend payment dummy is positive, although its statistical significance is weak, indicating that the firms which regularly pay out dividends have higher cash holdings.

The most of these results are opposite to the findings of Opler et al. (1999) with the US firms, in which the higher the size and net working capital, the lower the cash holdings; the higher the capital investments and investments in fixed assets, the higher the cash holdings; and the firms which pay out dividends have lower cash holdings.

Despite these major results supporting the financing hierarchy view in Brazil, there are also some results supporting the trade-off view, similarly to the findings in the USA:

- 1) The sign for the standard-deviations of operational profits is positive, although its statistical significance is weak, indicating that riskier firms have higher cash holdings.
- 2) The sign for the receivables is negative, showing that the higher the receivables, the lower the cash holdings, e.g., contrary to the inventories, the receivables work as good substitutes to the cash holdings.
- 3) The sign for the suppliers is positive, indicating that the higher the suppliers, the higher the cash holdings.

It can also be observed that the effect of the growth opportunities (market-to-book ratio) is not conclusive in Brazil, whereas the findings in the USA support the trade-off view.

Another notable difference between Brazil and the USA is in the results related to the financial leverage. The coefficient for the leverage measured by the total debt to total non-cash asset ratio in Brazil is positive, indicating that the higher the financial leverage, the higher the cash holdings, which is more consistent with the trade-off view. This is opposite to the results in the USA, where firms have negative sign for this explanatory variable, which is an evidence of the financing hierarchy view.

An intriguing question is how the leverage can be consistent with the trade-off view, while other major variables are consistent with the financing hierarchy view in Brazil, and vice-versa in the USA. There should be only one dominant view, either the trade-off or the financing hierarchy, among the firms in a country. On the other hand, when it is considered the net debt to total non-cash asset ratio in the analyses, the sign for the variable is negative, indicating that lower operational profits and/or a smaller size lead to lower cash holdings, which, in turn, lead to a higher leverage, supporting the financing hierarchy view in Brazil.

The analysis of cash holdings by types of debt provide us with more detailed insight about the relation between the leverage and the cash holdings. The bank loans explain more (their coefficients are higher) than the corporate bonds. In fact, the bank loans are more common than the financings by the capital markets transactions in Brazil. It is also noteworthy that the long-term debts explain more the cash holdings than the short-term debts, despite the fact that there are more short-term than long-term financing alternatives in Brazil.

The sign for short-term corporate bonds is negative, which indicates that the firms which access capital markets have lower cash holdings in the years when the securities become due. This is consistent with the financing hierarchy view, since the firms tend to be with no cash slack and, hence, with need to roll-over the debts when they become due.

The transaction, the precaution and the arbitrage motives can explain the higher cash holdings by the highly leveraged firms with the short-term bank loans. Credit line availability, fees and spreads the banks charge change following the market moods, which is very volatile in Brazil; therefore, firms may hold cash for the transaction and the precaution motives. In addition, firms may be practicing the arbitrage transactions with banks for short term.

Nevertheless, the transaction and the precaution motives do not explain adequately the higher cash holdings by the highly leveraged firms with the long-term debts. The arbitrage motive can be an explanation in the case of the long-term bank loans; however, it does not explain satisfactory in the case of the long-term corporate bonds. A possible explanation in this last case is the agency costs of managerial discretion, in which managers tend to hold more cash for their own comfort and security.

V. Objective of the Research

The results of the preliminary tests indicate that the corporate cash holdings in Brazil are managed more passively than actively, following more the financing hierarchy view than the trade-off view. It can be said generally in Brazil, therefore, that high operating profits lead to high cash holdings, letting the firms to auto-finance without debt, and they become bigger. Low operating profits lead to low cash holdings, obliging the firms to finance with debt, and they stay smaller. At financing with debt, firms tend to hold cash buffers for transaction and precaution motives, possibly enhanced by information asymmetry and agency costs of debt and managerial discretion, and hold extra cash for arbitrage motives.

In spite of these possible explanations, apparently opposing results that US firms generally follow the trade-off view but not when it is related to leverage and that Brazilian firms generally follow the financing hierarchy view but not when it is also related to leverage need to be investigated further.

The objective of the research is, therefore, to investigate the determinants of corporate cash holdings in Brazil in more details, seeking to discover the reasons by which they affect the cash holdings.

The focus of the research will be on the following issues:

- 1) The effects of business characteristics, including the involvement in international trade;
- 2) The effects of working capital management policies;
- 3) The relation between the cash holdings and the financial leverage;
- 4) The differences in the determinants of corporate cash holdings in Brazil and the USA; and,
- 5) The effects of transactions in the financial markets on the corporate cash holdings, in particular, the transactions between non-financial firms and banks.

Other issues which may be complementarily analyzed are the effects of asymmetric information, agency costs of managerial discretion, risk management policies, corporate governance issues, and the relation between the corporate cash holdings and company's performance, growth and value.

The macroeconomic variables, such as inflation, interest rate and foreign exchange rate, will be control variables.

VI. Final Remarks

The preliminary tests on the determinants of corporate cash holdings in Brazil indicate that the dominant view in Brazil is the financing hierarchy view, whereas it is the trade-off view in the USA. Were this really true, it would be the case of the

Brazilian firms managing the cash holdings with lower efficiency than the US firms, in spite of the lower availability of financial resources in Brazil than the USA

This research aims to obtain clearer conclusions on the subject, analyzing additional explanatory variables, using data in Brazil and the USA, and applying more robust econometric methods.

At analyzing the determinants of corporate cash holdings, the research should contribute in the field of Business Administration with the discovery of causes of inefficient use of financial resources by firms. The identification of causes of inefficiency shall lead to the discovery of solutions for their reduction, making firms to use the financial resources more efficiently.

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