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# Financial Constraints, Corporate Governance and the Value of Cash

**MARCELO DANIEL ARAUJO ERMEL**
UNIVERSIDADE DE SÃO PAULO (USP)

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# FINANCIAL CONSTRAINTS, CORPORATE GOVERNANCE AND THE VALUE OF CASH

## 1 Introduction

In the perfect world of Modigliani & Miller (1958) the cash would not be decisive for the firm's investment, since every company's investment project with a positive NPV would be funded by the market, in that way, liquidity problems would not exist.But in real world firms prefer to maintain some liquidity due due to the existence of market imperfections such as transaction costs, information asymmetry and agency costs. Still, the company should choose and maintain a cash level that maximizes the cost and benefit of keeping it. The determinants that lead the company to decide the optimal cash level have been extensively studied in the literature (Opler et al., 1999; Harford, 1999; Ozkan & Ozkan, 2004; Han & Qiu, 2007).

However, little attention was paid to the value attributed by the shareholders to a marginal increase in cash level (Faulkender & Wang, 2006). Agency theory predicts that an excess cash held by the company may not be beneficial to the shareholder, since the manager may use the excess cash for empire building (Jensen, 1986), thus, R$ 1 marginal cash may not represent an increase of R$ 1 in the market value of the company because of such problems.

Previous studies such as Dittmar & Mahrt-Smith (2007) and Denis & Sibilkov (2009) corroborate the hypothesis of empire building when identifying that in firms with better corporate governance practices, the R$ 1.00 marginal value is equivalent to an increase of market value greater than R$ 1.00. The authors attribute this effect to the shareholder's impression that due to good governance, this marginal cash will be well invested.

Another reason to value R$ 1.00 additional cashflow differently from R$ 1.00 is the access to the external financing market, Faulkender & Wang (2006) argue that the marginal cash value for financially restricted firms may be higher than for non-financially restricted firms, due to the possibility of using this increase in cash in financing positive NPV projects internally. In addition, marginal cash inflow means the firm is less likely to issue new shares or debt, thus representing savings in transaction costs.

Also, the marginal value of cash should be lower as the company reach a higher cash holdings level, since this represents a probable dividend distribution, and under US law, the investor who receive this dividend will be taxed, and thus, the $ 1 dollar will have its value reduced. It will also have low marginal value in the case of companies with higher levels of leverage, because the additional cash will probably be destined to the payment of the creditors. A more current point in the US market is the existence of large sums of cash outside the country, Harford et al. (2017) show that the marginal cash holdings beyond the country boarders is worth less by the shareholders than cash from activities within the firm's country.

Therefore, the objective of this paper is to investigate the marginal value of the cash allocated by the investor to the companies listed in BM&FBOVESPA, from 2000 to 2016. The Brazilian environment becomes important and relevant to this research agenda because it is

an emerging country with high interest rates, which lowers the costs of maintaining highers level of cash. Regarding external financing access, Brazil ranks low in the Credit/GDP ratio according to World Bank, and have an equity financing market in development. About corporate governance, Brazilian companies are known for the high shareholder concentration and low governance. Especially, Brazilian companies are more prone to the second type of agency problem, as controlling shareholders could use cash reserves and the excess cash to expropriate wealth from minority shareholders. Also, Brazil figures in the lowest quartile in shareholder protection (Porta et al., 1998). Finally, under Brazilian law, dividend payment is not subject to tax payment, i.e dividends are tax free.

Our main empirical results are the following. First, for the representative firm, Brazilian shareholders attribute a value of R$ 1.06 to the marginal cash inflow, additionally, there is no evidence that the investor evaluates marginal cash differently due to firm's financial restriction. Second, the hypothesis that the cash value is decreasing in the the cash level has also not been confirmed, a sign that, in the absence of dividend taxation, the shareholder does not attribute a different amount due to the probability of being distributed. Third, firms with better governance practices have the higher valued cash, at R$ 1.29, against R$ 0.79 of firms with worse governance practices, confirming the hypothesis that the shareholder realizes the possibility of bad use of cash and expropriation, our measure of corporate governance is robust, as shown by the determinants of cash, as firms classified with worse governance have larger coefficients associated with agency costs and monitoring. Finally, in Brazil shareholders does not seem to value persistent excess cash differently, this behavior can be due the high interest rates that companies can obtain from cash holdings and also due the need of internal financing as the debt market is sub par.

# 2 Methodology

To investigate the value attributed by shareholders to a marginal cash increase, a Faulkender & Wang (2006) cash holdings model was used estimated.

$$r_{it} - R^b_{it} = \beta_0 + \beta_1 \frac{\Delta C_{it}}{M_{it-1}} + \beta_2 \frac{\Delta E_{it}}{M_{it-1}} + \beta_3 \frac{\Delta NA_{it}}{M_{it-1}} + \beta_4 \frac{\Delta I_{it}}{M_{it-1}} + \beta_5 \frac{\Delta D_{it}}{M_{it-1}} + \beta_6 \frac{C_{it-1}}{M_{it-1}} + \beta_7 \frac{L_{it}}{M_{it-1}} + \beta_8 \frac{\Delta NF_{it}}{M_{it-1}} + \beta_9 \frac{\Delta C_{it}}{M_{it}} \times \frac{C_{it-1}}{M_{it-1}} + \beta_{10} \frac{L_{it}}{M_{it}} \times \frac{\Delta C_{it}}{M_{it-1}} + \epsilon_{it}$$

Where $r_i t - R_i t^b$ is the annual return of the company's most liquid stock minus the annual return of the quartile the company is in the separate portfolio by size and book-to-market calculated by NEFIN (Brazilian Center for Research in Financial Economics). According toFama & French (1993), size and book-to-market are common risk factors, so controlling by these two factors, any relationship between excess returns and cash changes would not be due to risk factors (Faulkender & Wang, 2006). Thus, the dependent variable of model 1 is the excess return. The independent variables of the model are controls for financing other than cash flow, but that are correlated with the firm's cash level. Thus $\Delta E_{it}$ represents the changes in the company's profit in year t, $\Delta NA_{it}$ the changes in assets net of cash, $\Delta I_{it}$ is the change in interest payments, $\Delta D_{it}$ is the dividend changes, $C_{(it-1)}$ is the cash level of the company in the previous year, $L_{it}$ is the leverage of the company in year t, $NF_{it}$ is a vector composed by the change in the leverage and also repurchase or issuance of shares. $\beta_9$ and $\beta_{10}$ seek to capture the effect of the marginal cash due to cash holdings level and marginal cash due to leverage.

All the independent variables are normalized by the market value of the company at the beginning of the year, so the interpretation of the model is an increase or decrease of R$ 1 in

the cash and market value.

The data used in the study were collected from Comdinheiro. It comprises all the companies that traded their stocks on the stock exchange in the period from 2000 to 2016, excluding the companies classified in Financial industry and Public Utility. In addition, we excluded companies that exhibited negative equity at some point in the sample, as well as those that presented possible errors, such as: negative total assets. Moreover all variables were winsorized at 1% level in both tails to treat outliers and errors.

Model 1 was estimated through a linear regression with multiple fixed effects, in the industry to eliminate invariant industry effects as well in the year to control for macroeconomics shocks that can interfere in the coefficients of the estimation, although the model has no causal interest. In addition to - because the dependent variable is the firm excess return- the standard errors were grouped in firm-year, as recommended by Petersen (2009).

# 3 Empirical Results

## 3.1 Cash value, financial restriction and corporate governance

Table 1 reports the summary statistic for our sample, it is possible to verify that the representative firm has an average annual return of 3% above the benchmark, while the median is -24%. The mean of the cash level is 26% of total assets, while the median is 0.08, that is, the cash level distribution seems to be asymmetric on the right, also, the average change in cash is positive, suggesting that Brazilian firms -in the period covered by this research - add cash to cash holdings. In relation to leverage, the sample average is 34% of the assets financed with debt. As for the payout, the representative firm pays 36% of its net profit as dividends.

Table 1: Summary Statistics

| VARIABLES | N | Mean | Standard-Deviation | p25 | Median | p75 |
|---|---|---|---|---|---|---|
| $r_{it} - R^b_{it}$ | 589 | 0.03 | 0.39 | -0.24 | -0.24 | 0.25 |
| $TotalAssets$ | 589 | 1.62e+10 | 2.41e+10 | 2.97e+09 | 2.97e+09 | 1.66e+10 |
| $Payout\%$ | 589 | 0.36 | 0.63 | 0.00 | 0.00 | 0.52 |
| $CashHoldings$ | 589 | 0.26 | 0.28 | 0.08 | 0.08 | 0.35 |
| $CashFlow$ | 467 | 0.08 | 0.09 | 0.03 | 0.03 | 0.12 |
| $Leverage$ | 589 | 0.34 | 0.25 | 0.14 | 0.14 | 0.51 |
| $MarkettoBook$ | 588 | 1.40 | 1.00 | 0.74 | 0.74 | 1.67 |
| $\Delta Cash$ | 589 | 0.03 | 0.15 | -0.02 | -0.02 | 0.07 |
| $\Delta Stocks$ | 589 | -0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| $\Delta NA$ | 589 | 0.18 | 0.44 | 0.02 | 0.02 | 0.24 |
| $\Delta E$ | 589 | 0.01 | 0.20 | -0.02 | -0.02 | 0.03 |
| $\Delta I$ | 589 | -0.00 | 0.17 | -0.02 | -0.02 | 0.01 |
| $\Delta D$ | 589 | 0.00 | 0.03 | -0.01 | -0.01 | 0.01 |
| $\Delta Debt$ | 589 | 0.08 | 0.29 | -0.01 | -0.01 | 0.14 |

The results from model are shown in Table 2. The value attributed by the shareholder to an increase of R$ 1 cash, for the firm that has no cash holdings and debt, is R$ 1.04 for the base model - equation 3. This indicates that in Brazil the investors attribute a value greater than R$ 1.00 to the marginal value of the cash. Despite the non-significance, contrary to what Falkender

and Wand (2006) predicted, in Brazil the investors do not seem to assign a different value to the marginal R$ 1.00 given the company's cash level.

The reason for this result can be due the absence of taxation on dividends, so there would be no reason why a cash increase likely to be distributed to shareholders would have a lower value. Also, the relationship between the marginal cash and the company's indebtedness is not statistically significant. Thus, regardless of the cash level and the indebtedness, investors attribute a marginal value of R $ 1.04 to each unit increase in cash.

Table 2: Cash Value Regression

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| VARIABLES | $r_{it} - R^b_{it}$ | | | |
| $\Delta C$ | 1.045*** | 0.940*** | 1.063*** | 0.911*** |
| | (0.290) | (0.293) | (0.287) | (0.303) |
| $\Delta NA$ | 0.227*** | 0.200** | 0.238*** | 0.264*** |
| | (0.073) | (0.070) | (0.073) | (0.070) |
| $\Delta E$ | 0.536*** | 0.542*** | 0.531*** | 0.538*** |
| | (0.118) | (0.115) | (0.125) | (0.145) |
| $\Delta I$ | -0.211 | -0.263 | -0.227 | -0.223 |
| | (0.125) | (0.154) | (0.148) | (0.193) |
| $\Delta D$ | 1.276*** | 1.146*** | 1.235*** | 1.218*** |
| | (0.388) | (0.288) | (0.388) | (0.360) |
| $\Delta Stocks$ | -3.252 | -3.382 | -3.369 | -3.818 |
| | (3.383) | (3.537) | (3.443) | (3.655) |
| $\Delta Debt$ | -0.501*** | -0.487*** | -0.525*** | -0.466*** |
| | (0.119) | (0.118) | (0.125) | (0.106) |
| $Leverage$ | 0.104 | 0.145 | 0.128 | 0.035 |
| | (0.120) | (0.122) | (0.139) | (0.123) |
| $\Delta C \times Leverage$ | -0.517 | -0.520 | -0.572 | -0.638 |
| | (0.519) | (0.474) | (0.498) | (0.431) |
| $\Delta C \times C_{t-1}$ | -0.375 | -0.151 | -0.340 | 0.056 |
| | (0.761) | (0.703) | (0.707) | (0.820) |
| Constant | -0.040 | -0.048 | -0.048 | -0.021 |
| | (0.037) | (0.053) | (0.042) | (0.041) |
| Observations | 589 | 589 | 589 | 589 |
| R-squared | 0.258 | 0.245 | 0.289 | 0.448 |
| Industry FE | No | Yes | Yes | No |
| Year FE | Yes | No | Yes | No |
| $Industry \times Year$ FE | No | No | No | Yes |
| Cluster | Firm & Year | Firm & Year | Firm & Year | Firm & Year |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

A theoretical reason for the differentiated valuation of the cash inflow is the company's external financing capacity (Faulkender & Wang, 2006; Denis & Sibilkov, 2009). Thus, model 1 was estimated for the following subsamples: firms larger than the median for total assets were considered unconstrained, firms smaller than the median for total assets were considered

constrained; firms larger than the median for tangibility (Fixed Assets/Total Assets) were considered unconstrained and firms smaller than the median were considered constrained.

In Table 3, the interaction between cash and cash change and cash change and indebtedness were not significant. However, when considering the estimates in relation to the subsamples (equations 2 and 3, 5 and 6) the results indicate that the shareholders assign a larger value to the cash for the companies considered as non-constrained, from R$ 1.42 when separated by total assets, and 1.57 as separated by tangibility, while for firms considered constrained, the value attributed to the cash is 0.96 for the unconstrained according to size and 1.18 according to tangibility.

Table 3: Cash Value Regression and financial restriction.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Full Sample | U | C | Full Sample | U | C |
| | | | $r_{it} - R^b_{it}$ | | | |
| $\Delta C \times Unconstrained$ | 0.047 | | | 0.045 | | |
| | (0.344) | | | (0.343) | | |
| $Unconstrained$ | -0.013 | | | 0.012 | | |
| | (0.047) | | | (0.037) | | |
| $\Delta C$ | 1.067*** | 1.418** | 0.961** | 1.068*** | 1.570** | 1.168** |
| | (0.279) | (0.602) | (0.438) | (0.279) | (0.537) | (0.433) |
| $\Delta NA$ | 0.252*** | 0.191* | 0.282*** | 0.249*** | 0.181* | 0.309*** |
| | (0.079) | (0.096) | (0.073) | (0.081) | (0.101) | (0.088) |
| $\Delta E$ | 0.505*** | 0.367** | 0.733*** | 0.513*** | 0.665*** | 0.485** |
| | (0.121) | (0.140) | (0.213) | (0.134) | (0.219) | (0.166) |
| $\Delta I$ | -0.203 | -0.597*** | 0.035 | -0.206 | -0.310* | 0.162 |
| | (0.150) | (0.145) | (0.254) | (0.159) | (0.174) | (0.244) |
| $\Delta D$ | 1.048*** | 0.395 | 1.340** | 1.043*** | 1.033 | 0.849 |
| | (0.273) | (0.712) | (0.548) | (0.250) | (0.747) | (0.609) |
| $\Delta Stocks$ | -3.521 | -0.157 | -8.644** | -3.574 | 2.325 | -7.749* |
| | (3.373) | (4.344) | (3.862) | (3.021) | (3.180) | (4.398) |
| $\Delta Debt$ | -0.539*** | -0.737*** | -0.307* | -0.538*** | -0.318* | -0.628*** |
| | (0.122) | (0.236) | (0.175) | (0.142) | (0.167) | (0.210) |
| $\Delta Leverage$ | 0.120 | 0.359 | -0.042 | 0.115 | 0.083 | 0.052 |
| | (0.136) | (0.209) | (0.144) | (0.140) | (0.120) | (0.169) |
| $\Delta C \times Leverage$ | -0.598 | -1.055* | -0.328 | -0.572 | -0.998 | -0.740 |
| | (0.545) | (0.584) | (0.786) | (0.532) | (0.731) | (0.647) |
| $\Delta C \times C_{t-1}$ | -0.332 | -0.048 | -0.206 | -0.341 | -1.271 | -0.069 |
| | (0.738) | (0.829) | (0.633) | (0.723) | (1.069) | (0.979) |
| Constant | -0.042 | -0.126 | -0.020 | -0.053 | -0.041 | -0.035 |
| | (0.049) | (0.080) | (0.032) | (0.047) | (0.041) | (0.052) |
| Observations | 588 | 289 | 299 | 588 | 289 | 299 |
| R-squared | 0.287 | 0.342 | 0.366 | 0.287 | 0.327 | 0.360 |
| $IndustryFE$ | Yes | Yes | Yes | Yes | Yes | Yes |
| $YearFE$ | Yes | Yes | Yes | Yes | Yes | Yes |
| $Industry \times YearFE$ | No | No | No | No | No | No |
| Cluster | Firm & Year | Firm & Year | Firm & Year | Firm & Year | Firm & Year | Firm & Year |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

However, for the full sample, when the change in cash and the dummy variable that classified the firms into the constrained and unconstrained were interacted, this effect was not statistically significant. Thus, due to robustness of inference, the results are those of columns 1 and 4, were the same way as in table 2, the value attributed to an increase of R$ 1.00 in the cash is

approximately R$ 1.05.

Another theoretical motivation for a different evaluation by the shareholders is the corporate governance, because in companies with better governance, there is a greater efficiency in the use of cash flow, as well as a smaller probability of minority expropriation by the controlling shareholder, in environments with low shareholder protection (Dittmar & Mahrt-Smith, 2007; Pinkowitz et al., 2006; Chan et al., 2013). Thus, as was done for the financial constraint, model 1 was estimated for subsamples with respect to governance: One measure of governance used was the existence of family ties between the board and the firm controller (equations 1, 2 and 3) and another was whether the company is listed in the Novo Mercado segment or not (equations 4, 5 and 6).

There are four listing segments in BMF&Bovespa related to governance, Novo Mercado, Level II, Level 1 and Regular. Created in 2000 by the BM&FBovespa, the Novo Mercado listing level is supposed to have the highest standard related to corporate governance. As Black et al. (2014) states, firms to be listed in Novo Mercado have to only issue common shares, a minimum of 25% free float, non-staggered terms for the board of director with mandates of 2 years or less, a minimum of 5 members board members, which 20% must be independent, and disputes of minority shareholders are settled in a private arbitration panel. Another listing level, the Level II, maintains most of the Novo Mercado requirements, but allow for dual class shares. From Level II to Level I, one relevant change is the minimum number of board members, instead of 5, Level I requires 3, with 20% of independent members, and Regular, requires only what is in the Brazilian law.

Table 4 report the test for means for both firms, Novo Mercado and Non-Novo Mercado. From it its possible to infer that firms are not statistically different neither in returns, payout, cash holdings, and all $\Delta$ variables but change in stocks. They only differ in Size, as Non Novo Mercado firms are bigger, Non Novo Mercado firms also have higher cash flows, but they dont have Market to Book as higher as Novo Mercado firms. Last but not least, it seems that Novo Mercado issue less stocks, as expected, due the impossibility to issue non voting shares, and also have smaller levels of leverage.

Table 4: Mean test for Novo Mercado e Non Novo Mercado firms'

| | Novo Mercado | | Novo Mercado | | |
|---|---|---|---|---|---|
| | N | Mean | N | Mean | T test |
| RjRt | 277 | 0,024 | 312 | 0,027 | -0,109 |
| AT | 277 | 26,2 | 312 | 7,64 | 10,06 |
| Payout | 277 | 0,324 | 312 | 0,388 | -1,22 |
| CashFlow | 164 | 0,093 | 304 | 0,065 | 3,226 |
| Market to Book | 276 | 1,258 | 312 | 1,518 | -3,15 |
| Cash Holdings | 277 | 0,274 | 312 | 0,255 | 0,851 |
| Change in Cash | 277 | 0,033 | 312 | 0,031 | 0,149 |
| Change in Assets | 277 | 0,17 | 312 | 0,182 | -0,347 |
| Change in Earnings | 277 | 0,014 | 312 | 0,006 | 0,470 |
| Change in Interest | 277 | -0,004 | 312 | -0,0018 | -0,218 |
| Change in Dividends | 277 | 0,0006 | 312 | 0,0023 | -0,588 |
| Change in Debt | 277 | 0,068 | 312 | 0,09 | -0,903 |
| Change in Stocks | 277 | 0,0002 | 312 | -0,0007 | 2,26 |
| Leverage | 277 | 0,3622 | 312 | 0,324 | 1,83 |

Table 5: Cash Value Regression and Corporate Governance.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | $r_{it} - R^b_{it}$ | | | | | |
| $\Delta C \times Familiar/NovoMercado$ | 0.015 | | | 0.516* | | |
| | (0.478) | | | (0.282) | | |
| $Familiar/NovoMercado$ | -0.030 | | | -0.018 | | |
| | (0.042) | | | (0.037) | | |
| $\Delta C$ | 0.928 | -1.221 | 1.333** | 0.762** | 0.963* | 1.146** |
| | (0.511) | (1.342) | (0.449) | (0.269) | (0.453) | (0.520) |
| $\Delta NA$ | 0.337* | -0.145 | 0.399** | 0.233** | 0.270*** | 0.161 |
| | (0.146) | (0.168) | (0.159) | (0.079) | (0.076) | (0.106) |
| $\Delta E$ | 0.481** | 0.820 | 0.445** | 0.571*** | 0.781** | 0.399** |
| | (0.143) | (0.444) | (0.138) | (0.144) | (0.270) | (0.167) |
| $\Delta I$ | -0.185 | 0.359 | 0.063 | -0.202 | -0.150 | -0.196 |
| | (0.286) | (0.340) | (0.622) | (0.163) | (0.330) | (0.193) |
| $\Delta D$ | 0.947*** | 1.185 | 1.080*** | 1.010*** | 0.266 | 2.118*** |
| | (0.204) | (2.494) | (0.265) | (0.331) | (0.596) | (0.644) |
| $\Delta Stocks$ | -0.790 | 2.073 | -2.979 | -3.019 | -1.338 | -7.025* |
| | (4.230) | (3.432) | (5.690) | (3.473) | (4.434) | (3.596) |
| $\Delta Debt$ | -0.566 | 0.490 | -0.678* | -0.482*** | -0.329* | -0.556*** |
| | (0.300) | (0.473) | (0.338) | (0.127) | (0.167) | (0.170) |
| $\Delta Leverage$ | -0.053 | -0.489* | -0.010 | 0.106 | -0.165 | 0.341* |
| | (0.186) | (0.208) | (0.180) | (0.140) | (0.136) | (0.172) |
| $\Delta C \times Leverage$ | -0.380 | 4.913 | -0.969 | -0.662 | -0.247 | -0.984 |
| | (1.083) | (3.054) | (0.935) | (0.571) | (0.509) | (0.924) |
| $\Delta C \times C_{t-1}$ | -0.267 | -1.832 | -0.170 | -0.254 | -0.147 | -0.476 |
| | (0.876) | (1.472) | (0.933) | (0.665) | (1.116) | (0.964) |
| Constant | 0.035 | 0.122 | 0.024 | -0.033 | 0.029 | -0.112** |
| | (0.057) | (0.080) | (0.060) | (0.043) | (0.047) | (0.051) |
| Observations | 342 | 68 | 274 | 588 | 311 | 277 |
| R-squared | 0.225 | 0.463 | 0.257 | 0.294 | 0.324 | 0.344 |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| ANO FE | No | No | No | No | No | No |
| $Industry \times YearFE$ | No | No | No | No | No | No |
| Cluster | Firm & Year | Firm & Year | Firm & Year | Firm & Year | Firm & Year | Firm & Year |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4 shows that there is no difference in the valuation of cash for firms with family ties or not, however, this result is likely to be biased due to the metric only exists post 2010, in addition, there are few observations of companies with this characteristic.

Regarding corporate governance measured by the presence in the segment of the Novo Mercado, the estimates indicate (equation 4) that the companies on this segment have the marginal cash valued at R$ 1.27 (0.762 + 0.516), while for the non-novo mercado firms, this value is only R$ 0.76.

The results corroborate the theory of the best use of cash because of the governance and the lower risk of expropriation (Dittmar & Mahrt-Smith, 2007; Schauten et al., 2013).

As a robustness test of the cash value regression, were estimated regressions using the Fama & French (2002) methodology. As the table 5 shows, column 4, firms with better governance have a higher value for cash than firms that do not belong to the Novo Mercado segment.

Table 6: Robustness Fama & French (2002) Market-to-Book methodology

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| VARIABLES | Market to Book | | | |
| Cash | 0.947*** | 0.564*** | 0.743*** | 0.243** |
| | (0.202) | (0.124) | (0.211) | (0.108) |
| Novo Mercado | | | 0.378** | 0.063 |
| | | | (0.179) | (0.063) |
| $NovoMercado \times Cash$ | | | 0.397 | 0.854*** |
| | | | (0.453) | (0.246) |
| Earnings | 1.709*** | 1.667*** | 1.770*** | 1.944*** |
| | (0.344) | (0.327) | (0.351) | (0.349) |
| F.Earnings | 0.245 | -0.379 | 0.205 | -0.381 |
| | (0.331) | (0.373) | (0.322) | (0.402) |
| F2.Earnings | -0.275 | -1.292*** | -0.290 | -1.157*** |
| | (0.331) | (0.349) | (0.335) | (0.339) |
| Dividend | 1.993*** | 1.972** | 2.184*** | 2.462*** |
| | (0.703) | (0.795) | (0.703) | (0.769) |
| F.Dividend | -0.079 | 0.258 | -0.118 | 0.079 |
| | (0.865) | (0.891) | (0.847) | (0.817) |
| F2.Dividend | -0.055 | -0.114 | 0.003 | -0.385 |
| | (0.807) | (0.802) | (0.777) | (0.777) |
| Interest | -0.717 | -1.087** | -0.891** | -1.193** |
| | (0.452) | (0.460) | (0.449) | (0.465) |
| F.Interest | 0.333 | -0.066 | 0.234 | 0.103 |
| | (0.446) | (0.456) | (0.441) | (0.452) |
| F2.Interest | 0.424 | 0.317 | 0.224 | 0.144 |
| | (0.460) | (0.517) | (0.447) | (0.501) |
| Netassets | -0.420*** | -0.705*** | -0.429*** | -0.605*** |
| | (0.114) | (0.125) | (0.111) | (0.110) |
| F.Netassets | 0.225* | 0.353** | 0.219* | 0.308** |
| | (0.117) | (0.176) | (0.114) | (0.156) |
| F2.Netassets | 0.146 | 0.363*** | 0.131 | 0.301*** |
| | (0.115) | (0.110) | (0.111) | (0.103) |
| F2.Market to Book | 0.318*** | 0.701*** | 0.309*** | 0.672*** |
| | (0.070) | (0.042) | (0.073) | (0.042) |
| Constant | 1.224 | -0.482* | 1.734 | -0.246 |
| | (1.650) | (0.255) | (1.541) | (0.256) |
| Observations | 1,432 | 1,432 | 1,432 | 1,432 |
| R-squared | 0.454 | 0.734 | 0.465 | 0.748 |
| Number of id | 202 | | 202 | |
| Industry FE | No | Yes | No | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| Industry*Year | No | No | No | No |
| Firm FE | Yes | No | Yes | No |

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

## 3.2 Excess cash, cash determinants and corporate governance

Another issue relating cash is the determinants of cash holdings, as, holding less cash due dividends or debt may be representative of higher agency costs, as shareholders and debtholders would make the CEO disgorge cash to prevent empire building, therefore, the following model were estimated to see if there is difference between the cash determinants of firms with better governance (Novo Mercado) and firms with worst governance (Non-Novo Mercado).

Table 7: Cash Holdings Determinants and Corporate Governance.

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | | Full Sample | | Novo Mercado | Non Novo Mercado |
| VARIABLES | | | Cash Holdings | | |
| Ln (Assets) | -0.001 | -0.013** | -0.013** | -0.003 | -0.017 |
| | (0.025) | (0.006) | (0.005) | (0.008) | (0.013) |
| Payout % | -0.001 | -0.010* | -0.012*** | -0.007 | -0.013** |
| | (0.003) | (0.005) | (0.004) | (0.006) | (0.006) |
| Leverage | 0.104 | 0.150*** | 0.120*** | 0.100** | 0.248*** |
| | (0.063) | (0.041) | (0.032) | (0.045) | (0.061) |
| Market to Book | 0.022* | 0.050*** | 0.041*** | 0.048*** | 0.035** |
| | (0.011) | (0.010) | (0.007) | (0.009) | (0.015) |
| Net Working Capital | -0.147 | -0.207*** | -0.213*** | -0.161*** | -0.213** |
| | (0.089) | (0.042) | (0.035) | (0.040) | (0.095) |
| Operating Cash Flow | -0.102 | -0.290** | -0.165** | -0.213 | 0.151 |
| | (0.145) | (0.132) | (0.082) | (0.131) | (0.107) |
| Capex | -0.134** | -0.291*** | -0.272*** | -0.174* | -0.250** |
| | (0.065) | (0.101) | (0.074) | (0.101) | (0.103) |
| CashFlow Volatility | 0.052 | -0.718*** | -0.605*** | -0.766*** | 0.186 |
| | (0.250) | (0.250) | (0.210) | (0.243) | (0.355) |
| Constant | 0.102 | 0.421*** | 0.447*** | 0.305** | 0.454 |
| | (0.543) | (0.123) | (0.137) | (0.152) | (0.300) |
| Observations | 390 | 390 | 390 | 240 | 150 |
| R-squared | 0.563 | 0.537 | 0.406 | 0.439 | 0.593 |
| Number of id | 80 | | | | |
| Industry FE | No | No | Yes | Yes | Yes |
| Year FE | No | No | Yes | Yes | Yes |
| $Industry \times YearFE$ | Yes | Yes | No | No | No |
| Firm FE | Yes | No | No | No | No |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As it can be seen from table 6, the leverage is a key determinant of cash holdings, and in firms with better governance, the cash holdings level is less related to it than in firms with worst corporate governance. The same reasoning is applied to dividends, so, it can be concluded that there is less agency costs in firms that are listed in Novo Mercado Segment.

As did in the models before, instead of running separate regressions by subsamples, we estimated the interacted model, because the results from table 6 can be due sampling error,

therefore, the results shown in the table 7, that firms in Brazil are gaining in scale in their cash level, for example, a 1% increase in total assets is related to a decrease of 0.027 percentage points in the cash holdings. This relationship between cash and assets is related to precautionary reasons for having cash. As for agency reasons, related to monitoring, when comparing firms in the Novo Mercado or not, firms with worse governance have a higher coefficient of leverage, but there is no difference in payout. One explanation for this can be the existence of mandatory dividend payment. Also, firms from Novo Mercado have a smaller sensitivity of cash, as show by the interaction between Novo Mercado dummy and Operating cashflow.

Table 8: Cash Holdings Determinants and Corporate Governance, interacted model.

| VARIABLES | (1)<br>Cash Holdings |
|---|---|
| ln(Assets) | -0.027*** |
| | (0.008) |
| Novo Mercado | -0.481** |
| | (0.197) |
| $NovoMercado \times ln(Assets)$ | 0.023*** |
| | (0.008) |
| Payout | -0.015*** |
| | (0.005) |
| $NovoMercado \times Payout$ | 0.008 |
| | (0.008) |
| Leverage | 0.215*** |
| | (0.055) |
| $NovoMercado \times Leverage$ | -0.148** |
| | (0.066) |
| Market to Book | 0.024** |
| | (0.012) |
| $NovoMercado \times MarkettoBook$ | 0.030** |
| | (0.014) |
| NetNWC | -0.254*** |
| | (0.081) |
| $NovoMercado \times NetNWC$ | 0.046 |
| | (0.088) |
| CashFlow | 0.131 |
| | (0.101) |
| $NovoMercado \times CashFlow$ | -0.475*** |
| | (0.156) |
| Capex | -0.233*** |
| | (0.089) |
| $NovoMercado \times Capex$ | 0.042 |
| | (0.133) |
| CashFlow Volatility | -0.171 |
| | (0.316) |
| $NovoMercado \times CashFlowVolatility$ | -0.600 |
| | (0.412) |
| Constant | 0.687*** |
| | (0.205) |
| Observations | 390 |
| R-squared | 0.456 |
| Industry FE | Yes |
| Year FE | Yes |
| $Industry \times YearFE$ | No |
| Firm FE | Yes |

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Another reason that cash can be valued differently is if the firm holds excess cash for long periods of time. We estimated the following model of excess cash by Dittmar & Mahrt-Smith (2007).

$CashHoldings_{it} = \beta_0 + \beta_1 ln(Assets)_{It} + \beta_2 Payout_{it} + \beta_3 Leverage_{it} + \beta_4 Market - to - Book_{it} + \beta_5 NetWorkingCapital + \beta_6 OperatingCashFlow + \beta_7 Capex + \beta_8 Risk + Industry \times YearFE + \epsilon_{it}$

Where Cash Holdings is Cash and near Cash over Total Assets, ln(Assets) is the logarithm of Total Assets, Payout is dividends paid over net profit, leverage is Total Debt over Total Assets, Market to Book is Market Capitalization over Book Total Equity, Net Working Capital is Current Assets minus cash and current liabilities, over total assets. Operating cash flow is operating cash flow from the cash flow statement over total assets, Capex is the ratio between the sum of fixed assets at time t-1 and depreciation at t minus fixed assets at time t, and total assets. Risk is the standard deviation of operating cash flow in the last 3 years.

Table 9: Cash value and persistent cash

| VARIABLES | (1) Persistent Cash for 2 Years $r_{it} - R^b_{it}$ | (2) Persistent Cash for 3 Years |
|---|---|---|
| $\Delta Cash \times PersistentCashHolder$ | -0.244 | -0.130 |
| | (0.709) | (0.639) |
| $PersistentCashHolder$ | 0.0418 | 0.0755 |
| | (0.0556) | (0.0571) |
| $\Delta Cash$ | 1.483* | 1.476** |
| | (0.797) | (0.744) |
| $\Delta NA$ | 0.346** | 0.373** |
| | (0.155) | (0.157) |
| $\Delta E$ | 0.484*** | 0.362* |
| | (0.181) | (0.188) |
| $\Delta I$ | -0.0280 | -0.0841 |
| | (0.254) | (0.249) |
| $\Delta D$ | 1.053*** | 1.226*** |
| | (0.394) | (0.203) |
| $\Delta Stocks$ | -2.687 | -2.742 |
| | (4.797) | (5.020) |
| $\Delta Debt$ | -0.590** | -0.727*** |
| | (0.278) | (0.262) |
| $Leverage$ | -0.0103 | 0.0403 |
| | (0.158) | (0.160) |
| $\Delta C \times Leverage$ | -1.014 | -1.019 |
| | (1.029) | (1.072) |
| $\Delta C \times C_{t-1}$ | -0.0248 | -0.0828 |
| | (1.086) | (0.994) |
| Constant | -0.272* | -0.309* |
| | (0.138) | (0.162) |
| Observations | 385 | 390 |
| R-squared | 0.263 | 0.256 |
| Industry FE | Yes | Yes |
| Year FE | Yes | Yes |
| $Industry \times Year$ | No | No |
| Firm FE | No | No |

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Hence, the firms were classified in Persistent Cash Holders for 2 years (firms that have more cash than the predicted by the model, for 2 years consecutively) and Persistent Cash Holders for 3 years (firms that have more cash than the predicted by the model, for 3 years consecutively). Table 8 shows that there is no difference in the value attributed to cash between excess cash holders or not. One possible explanation for this lack of liquidity premium is the underdeveloped market of long term financing in Brazil.

# 4 Conclusion

Due to market frictions, difficult in accessing financing through external capital, efficiency in using cash and corporate governance, an increase of R$ 1.00 in the company's cash can be worth more or less than R$ 1.00 for shareholders. Thus, Faulkender & Wang (2006) argued that for firms with difficult access to the market for debt and equity, the marginal value of cash would be greater than R$ 1.00 due to the possibility of making investments.

We classified firms as constrained or unconstrained according to size and tangibility criteria (Almeida et al., 2004), this paper did not find any differences in the value attributed by the shareholders to the marginal cash of financially constrained and unconstrained firms. This result may be due to the failure of the metric used to classify, since Farre-Mensa & Ljungqvist (2016) documented that firms classified as restricted were only smaller, younger and with greater investments opportunities, and had no difficulty in contracting debt in the same amount and at the same time as the non-constrained due to an exogenous need for indebtedness.

Jensen (1986) argues that managers with excess cash can use this resource to finance projects with negative NPV and/or meet their personal needs that are not in accordance with the interest of shareholders. One way to avoid this is to adopt governance systems that align interests. Thus, the present study corroborated this view by identifying a marginal value of R$ 1.29 for firms with good governance and only R$ 0.79 for firms with poor governance.

Also, firms that belong in the Novo Mercado (the measure of good governance) showed less relation between cash holdings, leverage and dividends, hence, it seems to be that these firms have less agency costs, as debtholders and equityholders does not seem to exercise forces to the CEO disgorge cash. Finally, shareholders does not valued differently persistent excess cash from not persistent excess cash.

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