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### Effects of Board Design and Managerial Ownership on the Level of Cash Holdings in Latin American Firms

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**Effects of Board Design and Managerial Ownership on the Level of Cash Holdings  
in Latin American Firms**

by

Pengyu Qian

A Thesis

Submitted to the Graduate Faculty of

St. Cloud State University

in Partial Fulfillment of the Requirements

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### **Abstract**

This paper analyzes the level of cash holdings and the role of corporate governance in monitoring the potential agency problem. This research studies the relationship between cash holdings, the Board of directors' design, and managerial ownership levels in Latin America's public traded companies in Argentina, Brazil, Chile, Colombia, Mexico, and Peru. I find a positive and statistically significant effect of board size and institutional ownership on cash holdings. I also find a negative and significant correlation between board duality and cash holdings. The results show that board independence is positively and statistically significantly associated with cash holdings when controlling for firms' characteristics.

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## Chapter 1: Introduction

Cash and cash equivalents held by any corporation is the most liquid asset. Keeping a certain amount of cash and cash equivalents not only helps with the firm's daily operation activities but is also a necessary condition to settle liabilities and avoid financial distress. The cash and cash equivalents include bank deposits and marketable securities that can be converted to cash quickly. A company must establish a particular cash and cash equivalents level, which works as its safety helmet. However, cash and cash equivalents bring the weakest return on investment and concern about the possible opportunity cost. Too much cash on hand could reduce the profitability and overall firm's financial performance, while too little cash may not be enough to cover operating expenses. Therefore, management should monitor the cash flow constantly and improve quality control on the cash reserve levels.

Bates et al. (2009) identify four motives that firms have to justify holding cash: the transaction motive, the precautionary motive, the tax motive, and the agency motive. Gao et al. (2013) show that the agency motive affects firms' cash levels and how managers react to excess cash. While managers try to find the "optimum" cash target level, firms with effective corporate governance can reduce the cash levels, given better management monitoring. In contrast, firms with weak corporate governance tend to overinvest in cash, resulting in lower profitability. With a historically high level of cash and cash equivalents sitting in firms' bank accounts, company managers and board directors should make wise decisions based on shareholders' interests rather than keeping the cash on hand. However, unfortunately, this is not always the case. Recent studies show that corporations maintain a high level of cash holdings. Bates et al. (2009) find that the average cash-to-assets ratio in American industrial firms has more than doubled from

1980 to 2006. Gao et al. (2013) present similar findings, where U.S. public firms hold an average cash level of 20.45 percent over total assets as of 2011. Artica et al. (2019) state that the median cash-to-assets ratio increased progressively from 2000 to 2014 in their study of listed firms from large Latin American countries in Argentina, Brazil, Chile, Mexico, and Peru, one of the few papers in the Latin American region.

Although there is a vast literature analyzing corporate cash levels in developed markets, emerging markets still need further investigation due to a lack of research. This paper explores corporate cash holdings and their relationship with potential agency problems in Latin America. The Latin American markets have different characteristics than developed economies. Compared to developed markets, these emerging and frontier markets have less market efficiency, a weaker regulatory environment in shareholder protection and enforcement, and a lack of corporate governance and financial reporting requirements. Those issues could create conditions where managers can extract private benefits to the detriment of shareholders, or the manager/owner can affect the benefits minority investors receive. As a result, this potential agency problem may decrease the firm value and lower shareholders' wealth.

Specifically, this paper analyzes the level of cash holdings and the role of corporate governance in monitoring the potential agency problem just described. This research aims to study the relationship between cash holdings, the Board of directors' design, and managerial ownership levels in Latin America's public traded companies in Argentina, Brazil, Chile, Colombia, Mexico, and Peru.



The rest of the paper is organized as follows. Chapter 2 provides a literature review and hypotheses. Chapter 3 discusses the data and methodology. Chapters 4 and 5 present the study results. Chapter 6 concludes the study and discusses the recommendations and further research.

## Chapter 2: Literature Review and Hypotheses

### *Management Ownership and CEO-Chairman of the Board Duality*

Recent empirical studies have shown evidence where managers might put self-interest before shareholders' interest. Abdioglu (2016) examined the impact of managerial ownership on the firms' cash holdings in Turkish Borsa Istanbul-100 index-listed firms and concluded that the alignment effect of managerial ownership at a multivariate level exists. Managers with ownership in the firm would use the firm's resources to increase the firm's value and hold less cash. Concurrently, management entrenchment exists in corporations with a higher ownership level where managers use the firm's resources for self-interests at shareholders' expenses. Vo (2018) shows similar results: managers use cash reserves for their personal advantage, and this action could cause potential agency problems such as investing in value-decreasing projects. Furthermore, Vo (2018) indicates that these issues are even more noticeable in emerging markets where investor protection is weak.

Core et al. (1999) find that firms with weaker and less effective governance structures result in CEOs earning higher compensation and causing agency problems. Gill and Shah (2012) examine Canadian public firms listed on the Toronto Stock Exchange to study the determinants of corporate cash holding levels. They conclude that board size and CEO duality might cause firms to have higher cash balances and create possible agency problems that will not be in shareholders' best interest. The CEO serves as a board chair with a dual role will create a conflict of interests and make it difficult to monitor the operations. This action could affect cash holding levels with this duality status, which could influence the board decisions. Based on the findings above, I propose the first two hypotheses,

*H<sub>1</sub>: There is a negative relationship between management ownership and cash holdings levels.*

*H<sub>2</sub>: There is a positive relationship between CEO – Chairman of the Board duality and cash holdings levels.*

The dilemma occurs when the management and Board of directors have specific motivations to increase their benefits rather than shareholders' interests. As a result, this action could bring negative consequences to a firm's financial performance and valuation. Lower levels of managerial ownership are associated with higher levels of cash. When cash levels are higher than the optimal value, managers can use this excess cash for their own private benefits. Similarly, when the CEO is the Chairman of the Board, the Board partially loses its monitoring role over the managerial actions. Therefore, I expect the presence of CEO-Chairman duality with higher levels of cash.

### ***Board Independence and Gender Diversity***

Lee and Lee (2009) show that firms with a higher percentage of independent directors and small board sizes tend to have lower cash holding levels. Firms with significant cash levels, weaker corporate governance structures, and higher expected managerial entrenchments will have lower subsequent profitability. Borhanuddin and Ching (2011) provide evidence that companies with lower levels of board independence tend to hold more cash than firms with balanced corporate governance structures do. Al-Najjar and Clark (2017) explore board size and board independence relationships on cash holdings in countries in the Middle East and North Africa; the study show for these emerging economies that there is a negative relationship

between board size and firms' cash holdings. There is also a negative relationship between independent directors and firms' cash holdings. However, there is a positive relationship between institutional ownership and cash holdings levels, showing that these institutional investors aim to increase their institutional benefits.

Additionally, gender diversity in modern corporate finance is a hot topic. Francoeur et al. (2008) studied the relationship between companies' financial performance and gender participation in the corporate Board and managerial positions. Francoeur et al. (2008) conclude that the firms would generate positive and significant abnormal returns when having a high female participation level. Reguera-Alvarado et al. (2015) had similar findings in their research where an increase in women's involvement on the boards had positive effects on financial results in Spanish firms. Reguera-Alvarado et al. (2015) recommend that gender diversity in boardrooms can bring different ideas and skillsets to a firm's operation and further provide corporate social responsibility. This paper plans to test how gender diversity, board size, and board independence relate to cash holdings in Latin American boardrooms. For the case of Latin America, I expect that the evidence will be consistent with that found by Al-Najjar and Clark (2017). Those arguments bring the third and fourth hypotheses.

*H<sub>3</sub>: There is a negative relationship between board independence and cash holdings levels.*

*H<sub>4</sub>: There is a positive relationship between the women participation and cash holdings levels.*

### **Chapter 3: Data and Methodology**

This chapter presents the data and methodology used in the empirical analysis.

#### ***Data***

I begin with the S&P Global Market Intelligence (Capital IQ) database to identify publicly traded companies in six Latin American countries, including Argentina, Brazil, Chile, Colombia, Mexico, and Peru.

I obtain 2018 and 2019's financial data and the latest 2019's corporate governance information. I only use the latest corporate governance data because Capital IQ only provides the most recent records. Due to the 1-year corporate governance data limitation, later in my analysis, I can only use cross-sectional procedures but not panel data for analysis. My final sample includes 652 companies based in six Latin American countries (Argentina, Brazil, Chile, Colombia, Mexico, and Peru.) I exclude financial institutions and public utilities because of their unique business structures and regulatory requirements.

I manually collect data on the ownership structures, such as the percentage of shares owned by insiders, which I defined as all executive officers and directors. I also create a dummy variable for institutional holders who own shares in that firm.

I also create different variables associated with board characteristics. Using the names of the executives and board members, I identify their respective gender. I also construct a dummy that takes the value of one, if the CEO is the Chairperson, and zero otherwise. In addition, I count the number of members in the corporate Board and the number of independent members. Finally, I construct a variable that identifies the proportion of independent members in the Board

of Directors. This financial and corporate governance information is available on the Capital IQ database.

### ***Model Specification***

This paper uses parametric tests associated with sample comparison and ordinary least squares (OLS) estimation for the analysis. I establish two models: one uses cash levels as a proportion of net assets as a dependent variable. In contrast, the second model uses cash and short-term investments levels as a proportion of net assets as a dependent variable. Consistent with previous literature, I define net assets as total assets minus cash or cash and equivalents, depending on the variable mentioned previously.

$$\begin{aligned}
 \text{Cash Level}_{it} = & \beta_0 + \beta_1 \text{Management Ownership Level}_{it} + \beta_2 \text{Institutional Holder}_{it} \\
 & + \beta_3 \text{Board Independence}_{it} + \beta_4 \text{Board Size}_{it} \\
 & + \beta_5 \text{Dual Role in Management}_{it} + \beta_6 \text{Management Gender Diversity}_{it} \\
 & + \beta_7 \text{Board Gender Diversity}_{it} + \beta_8 \text{Sales}_{it} + \beta_9 \text{Return on Assets}_{it} \\
 & + \beta_{10} \text{Price to Book Ratio}_{it} + \beta_{11} \text{Debt to EBITDA Ratio}_{it} \\
 & + \beta_{12} \text{Cashflow to Net Assets Ratio}_{it} \\
 & + \beta_{13} \text{Working Capital to Total Assets Ratio}_{it} + \beta_{14} \text{Dividend Yield}_{it} + \epsilon
 \end{aligned}$$

The definitions of variables are:

- Cash Level is a dependent variable that measures the ratio of cash over total net assets.

- Management Ownership Level is an independent variable that measures a ratio of the total number of shares held by management divided by the total number of shares outstanding.
- Institutional holder is a dummy variable. The value equals one if at least one type of institutional holder possesses that company's shares, otherwise zero.
- Board Independence is an independent variable that measures a ratio of total independent (outside) board members divided by the total number of board members.
- Board Size is an independent variable that calculates the numerical value of board members in the firm.
- CEO-Chairperson Duality: it takes the value of one if the firm's CEO serves as Chairperson on Board, and zero otherwise.
- Management Gender Diversity: it measures the ratio of total female executives over total executives.
- Board Gender Diversity: the number of female board members divided by the total number of board members.

$$\begin{aligned}
\text{Cash and Equivalents Level}_{it} = & \\
& = \beta_0 + \beta_1 \text{Management Ownership Level}_{it} + \beta_2 \text{Institutional Holder}_{it} \\
& + \beta_3 \text{Board Independence}_{it} + \beta_4 \text{Board Size}_{it} \\
& + \beta_5 \text{Dual Role in Management}_{it} + \beta_6 \text{Management Gender Diversity}_{it} \\
& + \beta_7 \text{Board Gender Diversity}_{it} + \beta_8 \text{Sales}_{it} + \beta_9 \text{Return on Assets}_{it} \\
& + \beta_{10} \text{Price to Book Ratio}_{it} + \beta_{11} \text{Debt to EBITDA Ratio}_{it} \\
& + \beta_{12} \text{Cashflow to Net Assets Ratio}_{it} \\
& + \beta_{13} \text{Working Capital to Total Assets Ratio}_{it} + \beta_{14} \text{Dividend Yield}_{it} + \epsilon
\end{aligned}$$

In this second model, the only different variable is the dependent variable, which I construct adding cash and short-term investments by dividing the resulting value by total net assets. In the following few sections, I describe in more detail the variables used in the models above.

### ***Independent Variables***

#### ***Insider percentage (insider\_percent)***

I use this variable to calculate the percent of shares owned by insiders. Insiders are defined as company executive officers, directors, and any individual or entity that owns more than 10% of that company's shares. I add the ownership held share levels by insiders, up to the top 50 insiders.

#### ***Institutional holder (holder\_institutional)***

I create this dummy variable to test whether institutional holder ownership affects the cash levels. In this case, I created a dummy that equals one if at least one type of institutional



holder possesses that company's shares. The types of institutional holders are banks or investment banks, private equity firms, venture capital firms, sovereign wealth funds, hedge fund managers, and traditional investment managers. Otherwise, the dummy variable equals zero.

***Board independence percentage (board\_indep\_perc) and Board Size (board\_size)***

I manually count the size of board members and the independent board members in each firm. The independent board members include independent Chairman of the Board, independent vice-chairman, independent president of the Board, independent director, independent, alternate director, independent Chairman of the fiscal council, an independent member of the supervisory committee, independent non-executive director, independent board member, independent proprietary director, an alternate independent member of the Board of directors, and such independent titles. Then I calculate the ratio of board independence for each firm. This proportion ranges from 0 to 1. The higher figure closer to 1 indicates a higher independence level in that company's Board and vice versa.

***CEO-board duality (board\_duality)***

I create this dummy variable that equals one if the same person serves as CEO or president and board chairperson for that organization. Otherwise, the dummy variable equals zero.

***Executive female participation level (exe\_female\_percent)***

I use Capital IQ's database to gather the executives' names. I manually check individuals' names and code the gender for those who don't have its information. I form this variable to check the percentage of female executives for each company. This percentage range is from 0 to 1. The

higher figure closer to 1 indicates a higher female participation level in that company's management and vice versa.

***Board female participation level (board\_female\_percent)***

I use Capital IQ's database to gather the board members' names. I manually check individuals' names and code the gender for those who don't have its information. I form this variable to check the percentage of female board members for each company. This percentage range is from 0 to 1. The higher figure closer to 1 indicates a higher female participation level in that company's board management and vice versa.

***Control variables***

I use several variables to control the level of cash holdings, including financial leverage, payout policy, firm profitability, and firm size. I include the following control variables in the analysis.

***Sales (sales\_log)***

Sales is revenue generated from the firm's operations. It is a logged value because of the skewness of the independent variable. The bigger size of the firm, the more sales it could have. I expect larger firms to hold more cash.

***Return on Assets (roa)***

Return on Assets is a profitability ratio that provides how much revenue a firm can generate from its assets. It uses net income divided by the total assets. I expect more profitable firms to hold higher cash holdings levels.

***Price to Book Ratio (price\_to\_book)***

Price to Book Ratio is a financial ratio that compares a firm's current market value to its book value. The current market value and book value are provided through Capital IQ's database.

***Debt to EBITDA Ratio (td\_ebitda)***

Debt to EBITDA Ratio is a debt ratio that indicates the capacity of a firm to cover its debts. It uses total debt divided by EBITDA (earnings before interest, taxes, depreciation, and amortization.)

***Cashflow to Net Assets Ratio (cashflow\_netassets)***

Cash flow to Net Assets Ratio measures the level of annual cash flows the firm generates. It is a proxy of the firm's ability to generate liquidity.

***Net Working Capital to Total Assets Ratio (nwc\_netassets)***

Net Working Capital to Total Assets Ratio shows the firm's short-term liquidity. It uses net working capital (the difference between current assets and current liabilities) divided by total assets.

***Dividend Yield (did\_yield)***

Dividend Yield shows how much a firm pays out in dividends each year compared to its stock price.

## Chapter 4: Descriptive Statistics and Univariate Tests

### *Summary Statistics*

The tables below report the basic descriptive statistics. Table 1 shows that the average firm cash in our sample is 39.07 million, a median of 12.84 million, and a standard deviation of 57.31 million. All the values are in U.S. dollars. The average firm cash and short-term investments are 58.65 million, a median of 20.64 million, and a standard deviation of 84.77 million. Because cash and short-term investment are considered liquid assets, I use the cash and short-term investments in my tests for the cash holding levels. In terms of financial data, the average firm in the sample has revenue of 462.50 million, assets of 763.25 million, an EBITDA margin of 16 percent, a one-year forward EBITDA growth rate of 10 percent, and a one-year sales growth rate of 43.45 percent (median value of 6.98 percent).

**Table 1**

### *Descriptive Statistics – Financial Ratios 1*

	n	Mean	SD	Min	25 <sup>th</sup> Percentile	Median	75 <sup>th</sup> Percentile	Max
rev	502	462.50	576.46	0.01	64.17	237.87	639.39	2,509.71
assets	513	763.25	927.82	0.17	111.92	356.56	1,086.14	4,265.90
cash_stinv	509	58.65	84.77	0.00	3.18	20.64	72.46	360.66
cash	501	39.07	57.31	0.00	1.90	12.84	50.53	254.42
ebitda_margin	592	0.16	0.15	-0.25	0.07	0.15	0.25	0.57
ebitda_g_1y	471	0.10	0.30	-0.67	-0.06	0.04	0.25	1.01
sales_g_1y	652	43.45	502.68	-88.34	0.00	6.98	20.26	12,648.57

Tables 2 and 3 continue to present the financial ratios. The average firm in the sample has a debt to EBITDA ratio of 2.13, debt to assets ratio of 0.25, CAPEX to revenue ratio of 4.94 percent. Furthermore, the dividend payout ratio of 25.73 percent, return on assets ratio of 4

percent, return on equity ratio of 8 percent, price to book ratio of 1.42, and an enterprise multiple of 7.88.

Table 3 shows the descriptive statistics associated with the dependent variables. In Latin America, the average level of cash as a percentage of total net assets is 0.05. The average cash and cash equivalents as a proportion of total net assets are 0.07.

Other relevant average values are the following: (1) Cash flow from net assets of 0.07, (2) working capital turnover ratio of 0.02, (3) the net working capital to assets ratio of 0.03, (4) a five-year beta of 0.30, and (4) the dividend yield ratio of 1.38. Because of the skewness of the independent variables, I use the log of total sales and or total assets in this study. The average logged total assets is 6.25, and the average logged sales is 5.73.

**Table 2**

*Descriptive Statistics – Financial Ratios 2*

	n	Mean	SD	Min	25 <sup>th</sup> Percentile	Median	75 <sup>th</sup> Percentile	Max
td_ebitda	432	2.13	1.64	0.00	0.78	1.97	3.07	7.39
debt_asset_rat	570	0.25	0.17	0.00	0.10	0.26	0.36	0.75
capex_rev	597	4.94	5.16	0.00	0.85	3.20	7.15	21.52
payout_rat	590	25.73	33.57	0.00	0.00	3.01	46.25	131.32
roa	582	0.04	0.04	-0.09	0.01	0.04	0.06	0.16
roe	507	0.08	0.10	-0.22	0.01	0.08	0.15	0.36
price_to_book	458	1.42	1.01	0.00	0.64	1.20	1.99	4.34

**Table 3***Descriptive Statistics – Financial Ratios 3*

	n	Mean	SD	Min	25 <sup>th</sup> Percentile	Median	75 <sup>th</sup> Percentile	Max
ev_ebitda	426	7.88	3.67	0.36	5.35	7.39	9.87	18.82
ch_cash	537	0.05	0.05	0.00	0.01	0.04	0.08	0.21
ch_both	533	0.07	0.07	0.00	0.02	0.05	0.10	0.30
cashflow_netassets	539	0.07	0.07	-0.14	0.02	0.07	0.11	0.28
nwc_sales	513	0.02	0.21	-0.52	-0.10	0.01	0.15	0.60
nwc_netassets	525	0.03	0.14	-0.35	-0.06	0.01	0.11	0.39
assets_total_log	577	6.25	1.85	1.19	5.01	6.22	7.56	11.19
sales_log	555	5.73	1.89	0.67	4.50	5.78	7.00	10.76
beta_5y	613	0.30	0.43	-0.78	0.00	0.17	0.56	1.53
did_yield	615	1.38	2.17	0.00	0.00	0.00	2.37	8.14

Table 4 shows descriptive statistics for the dependent variable cash and equivalents over total net assets by country. The purpose is to see if the cash and short-term investments holdings levels are different among the different countries. There were 52 Argentinan firms, 186 Brazilian firms, 100 Chilean firms, 42 Colombian firms, 72 Peruvian firms, and 81 Mexican firms in the sample. Colombian and Peruvian sample firms have the lowest mean of cash and short-term investments holdings at 0.05. On the other hand, Brazilian sample firms have the highest mean of cash and short-term investments holdings at 0.09. Figure 1 shows boxplots for each of the countries' samples.

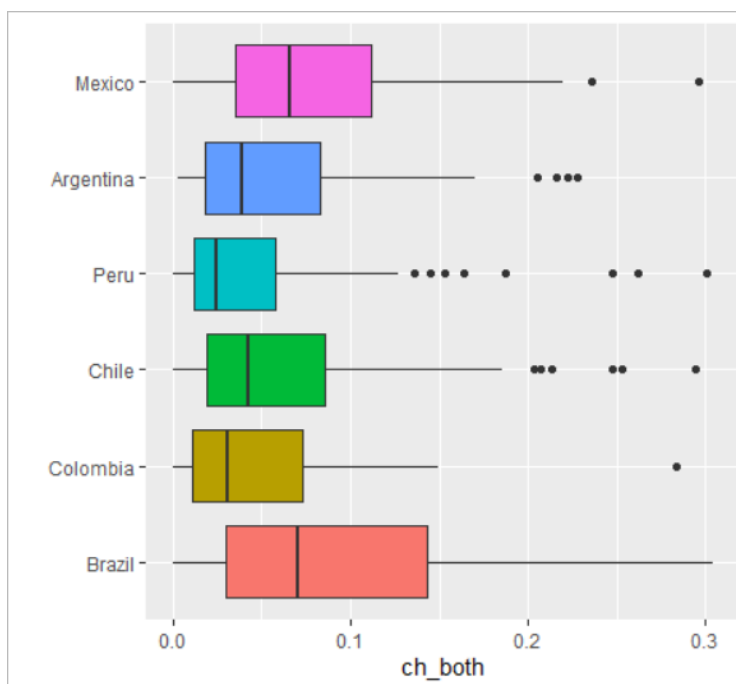
**Table 4**

*Descriptive Statistics - Cash and Equivalents Over Total Net Assets by Country*

	n	Mean	SD	Min	Median	Max
Argentina	52	0.06	0.06	0.00	0.04	0.23
Brazil	186	0.09	0.08	0.00	0.07	0.30
Chile	100	0.06	0.06	0.00	0.04	0.29
Colombia	42	0.05	0.06	0.00	0.03	0.28
Peru	72	0.05	0.02	0.00	0.02	0.30
Mexico	81	0.08	0.06	0.00	0.07	0.30

**Figure 1**

*Cash and Equivalents Over Total Net Assets by Country*



I performed an Analysis of Variance to test if the country samples were different. An F value of 6.846 is statistically significant at a 1 percent level.

**Table 5***Analysis of Variance*

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
country	5	0.1605	0.03209	6.846	3.35e-06 ***
Residuals	527	2.4705	0.00469		

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

119 observations deleted due to missingness

Furthermore, I performed a Tukey Honest Significant Differences test and a Pairwise comparison using t-tests with pooled standard deviation to identify the different countries in terms of cash levels. I present the results from the Tukey Honest Significant Differences test below.

**Table 6***Tukey Honest Significant Differences Test*

\$country	diff	lwr	upr	p adj
Colombia-Brazil	-0.042377272	-0.075833347	-0.0089211980	0.0042999
Chile-Brazil	-0.032785682	-0.057069402	-0.0085019615	0.0017558
Peru-Brazil	-0.043824037	-0.071005687	-0.0166423876	0.0000734
Argentina-Brazil	-0.031030476	-0.061750320	-0.0003106317	0.0461096
Mexico-Brazil	-0.015292389	-0.041362647	0.0107778685	0.5471547
Chile-Colombia	0.009591591	-0.026417172	0.0456003536	0.9736796
Peru-Colombia	-0.001446765	-0.039470100	0.0365765704	0.9999979
Argentina-Colombia	0.011346796	-0.029281282	0.0519748751	0.9676639



**Table 6 (continued)**

Mexico-Colombia	0.027084883	-0.010152065	0.0643218309	0.2991230
Peru-Chile	-0.011038355	-0.041306559	0.0192298485	0.9031138
Argentina-Chile	0.001755206	-0.031726594	0.0352370057	0.9999894
Mexico-Chile	0.017493292	-0.011780936	0.0467675206	0.5262684
Argentina-Peru	0.012793561	-0.022845939	0.0484330607	0.9088876
Mexico-Peru	0.028531648	-0.003187801	0.0602510967	0.1058404
Mexico-Argentina	0.015738087	-0.019061198	0.0505373712	0.7885947

In general, consistent with my description of cash levels above, the only country that seems to have statistically significant higher cash levels is Brazil, except when comparing Brazil and Mexico.

Turning to corporate ownership and board characteristics, in table 7, the average firm in the sample has 13.21 percent shares owned by insiders, a 13 percent female management participation level, and one in ten board members are women. In 89 out of 100 firms, at least one institutional holder owns shares, and 21 out of 100 firms have CEO-board duality. In addition, the average firm has a 9.90 board size, 2.15 independent board members, and 35 percent of the board members are independent.

**Table 7***Corporate Ownership and Board Characteristics*

	n	Mean	SD	Min	25 <sup>th</sup> Percentile	Median	75 <sup>th</sup> Percentile	Max
insider_percent	454	13.21	22.61	0.00	0.00	0.43	16.05	98.16
holder_institutional	638	0.89	0.32	0.00	1.00	1.00	1.00	1.00
exe_female_percent	568	0.13	0.18	0.00	0.00	0.06	0.20	1.00
board_female_percent	588	0.10	0.12	0.00	0.00	0.08	0.17	0.71
board_duality	561	0.21	0.41	0.00	0.00	0.00	0.00	1.00
board_size	651	9.90	5.71	1.00	6.00	9.00	12.00	40.00
board_indep	588	2.15	2.63	0.00	0.00	1.00	3.00	14.00
board_indep_perc	335	0.35	0.19	0.05	0.20	0.33	0.46	1.00

Table 8 reports the pairwise correlation coefficients between each size and liquidity variables with the dependent variables that proxy for cash holding levels. The significant positive correlations between the dependent variables *ch\_both* and *ch\_cash* with *sales\_log*, *assets\_total\_log*, and *cashflow\_netassets* are consistent with larger firms with higher operating cash flow having higher cash holdings. The positive association between cash holdings and *nwc\_sales* is consistent with liquid companies, even adjusting by cash levels, holding more cash.

**Table 8***Correlation Between Size and Liquidity Variables*

	ch_cash	ch_both	sales_log	assets_total_log	cashflow_netassets	nwc_sales	nwc_netassets
ch_cash		0.75*** (0.0000)	0.27*** (0.0000)	0.20*** (0.0000)	0.31*** (0.0000)	0.02 (0.6083)	0.01 (0.8722)
ch_both			0.24*** (0.0000)	0.17*** (0.0001)	0.32*** (0.0000)	0.03 (0.5152)	0.08* (0.0683)
sales_log				0.91*** (0.0000)	0.28*** (0.0000)	-0.11 (0.0131)	-0.12*** (0.0088)
assets_total_log					0.26*** (0.0000)	-0.14*** (0.0019)	-0.19*** (0.0000)
cashflow_netassets						-0.17*** (0.0001)	-0.17*** (0.0002)
nwc_sales							0.81*** (0.0000)

Table 9 shows the pairwise correlation coefficients between each growth/value variable and the levels of cash holdings. Again, the statistically significant positive correlation between the variables *ch\_both* and *price\_to\_book* implies that firms with substantial growth opportunities (indicative of high price-to-book ratios) retain higher levels of cash holdings. I find a similar conclusion when analyzing the positive and statistically significant correlation between the variables *ch\_both* and *ebitda\_g\_1y*.

**Table 9***Correlation Between Growth & Value Variables*

	ch_cash	ch_both	ebitda_g_1y	sales_g_1y	capex_rev	price_to_book	ev_ebitda
ch_cash		0.75*** (0.0000)	0.05 (0.3656)	0.01 (0.8095)	0.02 (0.6439)	0.25*** (0.0000)	0.04 (0.4688)
ch_both			0.11** (0.0387)	0.00 (0.9411)	-0.04 (0.3661)	0.27*** (0.0000)	0.02 (0.6425)
ebitda_g_1y				0.38*** (0.0000)	0.03 (0.5312)	0.09 (0.1044)	-0.02 (0.7282)
sales_g_1y					0.00 (0.9523)	0.13*** (0.0047)	-0.02 (0.6600)
capex_rev						0.10** (0.0451)	-0.05 (0.3758)
price_to_book							0.31*** (0.0000)

Table 10 shows the pairwise correlation coefficients between each profitability and leverage variable and the level of cash holdings. The significant positive correlations between the variables *ch\_both* and *roe*, *ch\_both* and *roa*, *ch\_both* and *payout\_rat*, *ch\_both* and *beta\_5y*, *ch\_both* and *did\_yield* illustrate that firms with higher levels of profitability and cash distribution via dividends have higher levels of cash holdings. I find partial evidence of a positive correlation between cash holdings and risk when I use cash and equivalents to proxy for cash holdings (*ch\_both*). Nevertheless, the negative correlation between the variables *ch\_both* and *td\_ebitda* suggests that firms with higher debt levels hold lower cash levels.

**Table 10***Correlation Between Profitability and Leverage Variable*

	ch_cash	ch_both	ebitda_margin	roe	roa	payout_rat	beta_5y	did_yield	td_ebitda	debt_ass et_rat
ch_cash		0.75*** (0.0000)	0.08* (0.0858)	0.17*** (0.0005)	0.17*** (0.0002)	0.18*** (0.0000)	0.07 (0.1355)	0.12*** (0.0081)	-0.20*** (0.0001)	0.04 (0.3090)
ch_both			0.10** (0.0260)	0.22*** (0.0000)	0.21*** (0.0000)	0.22*** (0.0000)	0.15*** (0.0007)	0.13*** (0.0026)	-0.25*** (0.0000)	-0.02 (0.7057)
ebitda_margin				0.40*** (0.0000)	0.56*** (0.0000)	0.36*** (0.0000)	0.03 (0.4910)	0.34*** (0.0000)	0.03 (0.5150)	0.13*** (0.0031)
roe					0.72*** (0.0000)	0.34*** (0.0000)	0.09** (0.0365)	0.33*** (0.0000)	-0.30*** (0.0000)	-0.03 (0.5160)
roa						0.35*** (0.0000)	0.05 (0.2063)	0.27*** (0.0000)	-0.28*** (0.0000)	0.06 (0.1746)
payout_rat							0.05 (0.2496)	0.58*** (0.0000)	-0.12** (0.0189)	-0.02 (0.5906)
beta_5y								0.09** (0.0250)	0.02 (0.6304)	0.02 (0.5843)
did_yield									0.03 (0.5717)	0.07 (0.0916)
td_ebitda										0.55*** (0.0000)

Table 11 shows the pairwise correlation coefficients of the corporate governance variables and the dependent variables that proxy for cash holdings. The statistically significant positive correlation between the variables *ch\_both* and *holder\_institutional* suggests that institutional holders might value the firm's cash levels when making investment decisions. In addition, the positive correlation between the variables *ch\_both* and *board\_size* indicates that the size of the Board affects the cash holdings level in sample firms. This result is statistically significant, at least at a 10 percent level. Likewise, results show a positive correlation between the variables *ch\_both* and *board\_indep\_perc* at a ten percent confidence level. This initial result is not consistent with the hypothesis indicating a negative relationship between board independence and cash holdings. Finally, the negative relationship between the variables *ch\_both* and *board\_duality* goes against my hypothesis based on empirical evidence from developed economies. There is a negative correlation between CEO-Chairman of the Board duality and cash holdings levels. This result might happen because, in Latin America, the manager is usually the primary owner of the firm, and the classical agency problem found in developed economies is not present. This negative correlation is significant at a 10 percent level only.

It is worth mentioning that the negative correlation between the variables *board\_duality* and *exe\_female\_percent* shows that CEO-board duality occurs less when sample firms have female executive participation.

**Table 11***Correlation Between Corporate Governance Variables*

	ch_cash	ch_both	insider_percent	holder_institutional	exe_female_percent	board_quality	board_size	board_independence
ch_cash		0.75*** (0.0000)	-0.05 (0.3611)	0.14*** (0.0010)	0.02 (0.6684)	-0.09* (0.0572)	0.11* (0.0128)	0.08 (0.1499)
ch_both			0.05 (0.3597)	0.12*** (0.0052)	-0.02 (0.6757)	-0.08* (0.0688)	0.10** (0.0248)	0.10* (0.0702)
insider_percent				-0.06 (0.2262)	0.02 (0.7109)	0.11** (0.0278)	0.09* (0.0530)	-0.04 (0.5801)
holder_institutional					-0.04*** (0.4050)	0.02 (0.6785)	0.16*** (0.0000)	0.00 (0.9752)
exe_female_percent						-0.11*** (0.0077)	0.02 (0.6806)	0.05 (0.3607)
board_quality							-0.07 (0.1151)	0.15*** (0.0064)
board_size								-0.25*** (0.0000)

*Univariate Tests*

Table 12 reports the results of univariate tests for differences in the average corporate levels of cash holdings. I create two groups of cash holdings: high cash holdings and low cash holdings. To identify each group, I use the *ch\_both* variable's median value 0.04827 as the cut-off point for the cash level. Next, to determine statistical differences between the samples, I perform the Welch two-sample t-test and Wilcoxon rank-sum test for medium differences in four different groups of variables: size and liquidity, growth and value, profitability and leverage, and corporate governance.

Looking at the size and liquidity variables, the high cash holdings firms have more revenue and assets than the lower cash holdings ones. Usually, large corporations have more cash than small ones, resulting in higher sales levels and higher cash flow for net assets. When

looking at the growth and value variables, firms with higher cash holdings generate 15.06 percent EBITDA annual growth, while low cash holdings firms only generate 5.18 percent growth. Firms with higher cash holdings also have a higher price to book ratio of 1.63 relative to firms with lower cash holdings (1.16). The Wilcoxon rank-sum test indicates one-year sales growth is significant at a 5 percent confidence interval but not when using the Welch Two Sample t-test. I presume that the sales variable contains outliers, even after I controlled for outliers.

Profitability and leverage variables show that firms with higher cash holdings generate a higher return on assets, return on equity and EBITDA margin than firms with lower cash holdings. They also distribute more resources to shareholders as proxied by higher payout ratios and dividend yields. In addition, firms with higher cash holdings also have a lower debt-to-EBITDA ratio than those with lower cash holdings. When analyzing the corporate governance variables, institutional investors own shares in 95 out of 100 firms with higher cash holdings. In comparison, institutional holders own shares in 83 out of 100 firms with lower cash holdings firms. Finally, firms with higher cash holdings firms have 11 board members, while firms with lower cash holdings have an average of 9 members.

In the univariate analysis, I find partial evidence of ownership affecting cash levels. However, it is not managerial ownership but institutional ownership that affects cash levels. Firms with higher cash holdings have higher institutional ownership than those with lower cash holdings. I attribute this statistically significant result to institutional investors seeking investments in firms with higher cash safety levels in volatile emerging markets. These firms will be larger-size firms, in general. I also find strong statistical evidence that firms with more



board members have higher cash holdings. This result is statistically significant at a one percent level. I do not find evidence at the univariate level that supports the hypotheses related to gender diversity and board independence.

**Table 12**

*Univariate Tests by High and Low Cash Holdings*

Variable Name	High Cash Holdings	Low Cash Holdings	Welch Two Sample t-test	Wilcoxon rank-sum test
<b>Size and Liquidity</b>				
assets_total_log	6.770279	5.815011	6.0671***	44552***
sales_log	6.379225	5.130778	7.7867***	43542***
cashflow_netassets	0.087518	0.048959	6.4540***	41259***
nwc_sales	0.014687	0.025794	-0.58666	26219
nwc_netassets	0.030703	0.024169	0.52589	29249
<b>Growth and Value</b>				
ebitda_g_1y	0.150630	0.051848	3.19970***	21962***
sales_g_1y	0.678808	0.311961	0.76357	39370**
capex_rev	5.096457	5.427307	-0.72280	31208
price_to_book	1.634109	1.159687	5.07850***	27812***
ev_ebitda	7.908233	7.907928	0.00082	18866
<b>Profitability and Leverage</b>				
ebitda_margin	0.183630	0.158833	1.87970*	32815*
roe	0.097502	0.062824	3.65850***	28993***
roa	0.047579	0.031160	4.45630***	37672***
payout_rat	0.325762	0.222281	3.38490***	34403***
beta_5y	0.407234	0.255514	4.06020***	37985***
did_yield	0.018389	0.012664	2.88200***	36799***
td_ebitda	2.066203	2.556344	-3.01530***	14002***
debt_asset_rat	0.257079	0.247584	0.65364	33965
<b>Corporate Governance</b>				
insider_percent	0.140945	0.136923	0.17315	18809
holder_institutional dummy	0.954887	0.830827	4.71280***	39767***
exe_female_percent	0.131442	0.139363	-0.48724	33224
board_female_percent	0.114203	0.106724	0.66862	35406
board_duality	0.192771	0.204918	-0.33716	30009
board_size	11.34241	9.139535	4.38210***	40526***
board_indep_perc	0.363487	0.338672	1.1202	12090

## Chapter 5: Regression Analysis

This section shows the multivariate analysis performed using OLS regressions where the dependent variable proxies for cash holdings. Tables 13 and 14 show regression results where the dependent variables are (1) cash over total net assets and (2) cash and equivalents over total net assets, respectively. Each cell in Table 11 shows the coefficient and the standard error in parenthesis. Each column represents a different regression. In column/regression 1, I test how all the corporate governance variables affect firms' cash holdings levels in publicly traded firms in Latin America. When I do not include control variables, the *board\_size*, and *board\_indep\_perc* variables are statistically significant at least at a 5 percent level. Larger boards and a higher proportion of independent board members positively affect the cash holdings in Latin America. Note that the board independence results are consistent with those found in the correlation analysis above. This result, although going against the hypothesis, is interesting in itself. In emerging economies where the manager is the primary owner, better monitoring might imply higher levels of cash holdings because the cash holdings are less subject to being misused by the manager/owner.

Next, in the second model (column 2), I test how management and institution ownership affect sample firms' cash holdings level when controlling for growth, size, and profitability. Note that I am also controlling for country differences in each regression. When controlling for firms' properties such as profitability and size, management and institutional ownership do not affect cash holdings. This result does not support hypothesis 1.

Then, in the third model, I test how the board independence and CEO-Chairman of the board duality affect the firms' cash holdings. The third model shows that *board\_indep\_perc*

positively and statistically affects cash holdings. This result is consistent with model-one results. Board independence is a relevant corporate governance variable that affects cash holdings, even after controlling for firms' characteristics.

In model/regression 4, I test how gender diversity affects firms' cash holdings levels. I find that the variables *exe\_female\_percent* and *board\_female\_percent* are not statistically significant. This result does not support hypothesis 4. Finally, in column 5, I test the full model with all the corporate governance and control variables. The variable associated with board independence retains its statistically significant level at a 1 percent level.

Table 14 shows the regression analysis where the dependent variable is the proportion of cash and short-term investment over total net assets. In general, the results in Panel B are consistent with the results I explained and shown in Panel A of Table 11. The main difference related to the corporate governance variables associated with the hypotheses is that the percentage of independent directors, although statistically different from zero, is less robust across the regressions performed.

**Table 13***Regression Results - Cash Over Total Net Assets*

	(1)	(2)	(3)	(4)	(5)
insider_percent	-0.00002 (0.00010)	0.00005 (0.00013)			0.000092 (0.000143)
holder_institutional	0.00936 (0.00841)	-0.004581 (0.01027)			-0.01146 (0.01103)
board_indep_perc	0.02465** (0.01069)		0.03699*** (0.01253)		0.04309*** (0.01417)
board_size	0.00143*** (0.00046)		0.000027 (0.000484)		0.000272 (0.000613)
board_duality	0.00042 (0.00601)		-0.002305 (0.006249)		0.00101 0.00717
exe_female_percent	0.00317 (0.01285)			0.01130 (0.01358)	0.01898 (0.01580)
board_female_percent	0.00843 (0.01720)			-0.01739 (0.02106)	-0.00888 (0.02319)
sales_log		0.005954*** (0.001757)	0.004395*** (0.001568)	0.00552*** (0.00146)	0.00513*** (0.00193)
roa		-0.1371 (0.9322)	-0.07722 (0.0903)	-0.09660 (0.09146)	-0.1830* (0.1001)
price_to_book		0.00498 (0.00314)	0.001993 (0.002863)	0.00299 (0.00288)	0.00429 (0.00316)
td_ebitda		-0.00664*** (0.001654)	-0.00598*** (0.00147)	-0.00578*** (0.00149)	-0.00689*** (0.00316)
cashflow_netassets		0.08855 (0.05818)	0.1178** (0.05513)	0.12253** (0.05542)	0.1164* (0.06267)
nwc_netassets		0.00209 (0.02416)	0.02546 (0.02077)	0.02835 (0.02088)	0.001539 (0.02513)

**Table 13 (continued)**

did_yield		0.00044 (0.00134)	-0.00034 (0.001163)	-0.00040 (0.00116)	0.000563 (0.00137)
Intercept	0.02169** (0.01067)	0.03123** (0.01409)	0.02996*** (0.01086)	0.02802** (0.01090)	0.03117** (0.01579)
Country Controls					
Colombia	-0.01913 (0.00645)	-0.01840* (0.00915)	-0.02231** (0.00935)	-0.01731* (0.00942)	-0.02634** (0.01044)
Chile	-0.00091 (0.00645)	-0.00401 (0.00838)	-0.00156 (0.00714)	-0.00266 (0.00705)	-0.00141 (0.00873)
Peru	-0.01056 (0.00810)	-0.01807* (0.00977)	-0.0182** (0.00847)	-0.01870** (0.00839)	-0.01876* (0.0101)
Argentina	-0.02605** (0.01048)	-0.03279** (0.01100)	-0.0336*** (0.01037)	-0.03457*** (0.01010)	-0.04168*** (0.01278)
Mexico	0.00879 (0.00793)	0.00468 (0.00832)	-0.005767 (0.007949)	0.00264 (0.00704)	-0.00813 (0.00965)
Adjusted R-Squared	0.1041	0.2153	0.1888	0.1701	0.2395
F-Statistic	4.438***	5.469***	5.669***	5.408***	4.679***

**Table 14***Regression Results - Cash and Equivalents Over Total Net Assets*

	(1)	(2)	(3)	(4)	(5)
insider_percent	-0.00003 (0.00016)	0.00011 (0.00017)			0.00012 (0.00018)
holder_institutional	0.01609 (0.01223)	-0.00809 (0.01273)			-0.01471 (0.01381)
board_indep_perc	0.03262** (0.01572)		0.026336 (0.01622)		0.03635** (0.01832)
board_size	0.00171** (0.00067)		0.000028 (0.000312)		0.00029 (0.00078)
board_duality	-0.00656 (0.00887)		-0.004323 (0.008184)		-0.00327 (0.00944)
exe_female_percent	0.00658 (0.01878)			-0.01116 (0.01723)	0.00839 (0.02019)
board_female_percent	0.00896 (0.02550)			-0.02434 (0.02697)	-0.02027 (0.03000)
sales_log		0.00648*** (0.00220)	0.00392* (0.00201)	0.00479*** (0.00184)	0.00556** (0.00244)
roa		-0.22134* (0.11707)	-0.1441 (0.1157)	-0.16228 (0.11622)	-0.28278** (0.12884)
price_to_book		0.00678* (0.00402)	0.006718* (0.003723)	0.00718* (0.00372)	0.00660 (0.00409)
td_ebitda		-0.00975*** (0.00209)	-0.00879*** (0.001901)	-0.00875*** (0.00190)	-0.01016*** (0.00215)
cashflow_netassets		0.22738*** (0.07381)	0.1897*** (0.0711)	0.19640*** (0.07059)	0.25930*** (0.08089)
nwc_netassets		0.05864* (0.03001)	0.0691*** (0.0264)	0.06709** (0.02636)	0.06371** (0.03126)

Table 14 (continued)

did_yield		0.00114 (0.00167)	0.00053 (0.00147)	0.00054 (0.00146)	0.00127 (0.00172)
Intercept	0.04564*** (2.906)	0.05835*** (0.01792)	0.06125*** (0.01389)	0.06383*** (0.01387)	0.06273*** (0.02029)
Country Controls					
Colombia	-0.04226*** (0.01312)	-0.03990*** (0.01257)	-0.04048*** (0.01205)	-0.03482*** (0.01202)	-0.04467*** (0.01335)
Chile	-0.02517*** (0.00953)	-0.02768** (0.01074)	-0.02777*** (0.009324)	-0.02912*** (0.00912)	-0.02633** (0.01142)
Peru	-0.02231* (0.01166)	-0.03869*** (0.01234)	-0.03756*** (0.01092)	-0.03894*** (0.01069)	-0.03965*** (0.01301)
Argentina	-0.03573** (0.01521)	-0.05206*** (0.01414)	-0.04324*** (0.01311)	-0.04449*** (0.01271)	-0.05862*** (0.01644)
Mexico	-0.01568 (0.01157)	-0.02917*** (0.01062)	-0.03065*** (0.01023)	-0.02607*** (0.00898)	-0.03901*** (0.01253)
Adjusted R-Squared	0.07689	0.2854	0.225	0.2233	0.2853
F-Statistic	3.499***	7.447***	6.845***	7.203***	5.643***

## **Chapter 6: Conclusions, Recommendations, and Further Research**

Using a sample of Latin American firms with detailed information about their corporate governance, I show how corporate governance affects cash holdings levels. I find a positive and statistically significant effect of board size and institutional ownership on cash holdings. Managerial ownership, which is directly related to hypothesis 1, does not seem to be a relevant variable.

I also find a negative and significant correlation between board duality and cash holdings. This result relates with one of the hypotheses, although the sign is opposite of the evidence found in developed economies. This result does not hold in other univariate and multivariate analyses performed.

OLS regression results show that board independence is positively and statistically significantly associated with cash holdings when controlling for firms' characteristics. This result related to hypothesis 3 is the opposite of what other researchers have found in developed economies. I will further research the potential cause of this positive relationship. As I described in the analysis of results, in emerging economies where the manager is the primary owner, better monitoring might increase the levels of cash holdings because the cash holdings are potentially less subject to being misused by the manager/owner.

An important limitation of this research is that the database available only provides the most recent corporate governance variables. This limitation does not allow me to perform a Panel Data (Cross-sectional/Time-Series) regression analysis to make sure that the most recent year, 2019, in my case, drives the results. Future avenues of research include studying the interaction of corporate governance variables with country governance proxies.



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