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**Essays on cash holdings, accounting quality and cost of capital under IFRS adoption
in Latin America**

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RIBEIRÃO PRETO

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in Latin America**

Tese apresentada ao Programa de Pós-Graduação em Controladoria e Contabilidade da Faculdade de Economia, Administração e Contabilidade de Ribeirão Preto da Universidade de São Paulo, para obtenção do título de Doutora em Ciências.

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RIBEIRÃO PRETO

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“I always say: To have a big dream requires the same effort as having a small dream.

Dream big!”

Jorge Paulo Lemann

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RESUMO

Essa tese objetiva analisar as relações entre saldo de caixa, qualidade da informação contábil e custo de capital, considerando a adoção das Normas Internacionais de Contabilidade (IFRS) na América Latina. No primeiro artigo, foi analisado o efeito da adoção das IFRS na qualidade da informação contábil, especificamente em relação às práticas de gerenciamento de resultado nas empresas. Os resultados demonstraram que a adoção das IFRS reduziu o escopo de gerenciamento de resultados nas empresas da América Latina. Os resultados também demonstram que a adoção das IFRS diminuiu o saldo de caixa nessas empresas, como uma consequência de melhores padrões de qualidade nos relatórios financeiros. Testes adicionais sugerem que os benefícios da adoção das IFRS são mais pronunciados em empresas que não possuem negociação de ADRs no mercado norte-americano, uma vez que as empresas com ADRs já apresentam fortes incentivos para melhoria da qualidade da informação contábil. No segundo artigo, foi analisado o efeito da adoção das IFRS na relação entre saldo de caixa e custo de capital nas empresas da América Latina. Os resultados demonstraram que a adoção das IFRS impactou a relação entre saldo de caixa e custo de capital próprio nas empresas da América Latina. Ou seja, quando essas empresas aumentam o custo de capital próprio após a adoção das IFRS, elas também aumentam os seus níveis de caixa. Análises adicionais demonstraram que a adoção das IFRS impactou o custo de capital próprio somente em empresas não internacionalizadas, pois essas empresas estão mais propensas a dificuldades de captação que as empresas internacionalizadas. Para o custo da dívida, os resultados não se mostraram significativos, uma vez que os credores já possuem mecanismos próprios para controle de garantias de empréstimos. Por fim, no terceiro artigo, foi analisado se os *accruals* discricionários mensurados pelo lucro bruto possuem *value relevance* no contexto de adoção das IFRS, quando comparado aos *accruals* discricionários mensurados pelo lucro líquido. Adicionalmente, foi analisado se os *accruals* discricionários mensurados pelo lucro bruto possuem informação complementar ao saldo de caixa, impactando o *value relevance*. Os resultados demonstraram que os *accruals* discricionários mensurados pelo lucro bruto impactam no *value relevance* das empresas e esses resultados são afetados pela adoção das IFRS. Para os *accruals* discricionários mensurados pelo lucro líquido, não foram encontrados resultados significativos. Os testes adicionais sugerem que, no contexto de melhores níveis de informação contábil, a informação relacionada ao lucro bruto se torna mais confiável, se tornando uma melhor maneira de prever o desempenho futuro das empresas que o saldo de caixa. No geral, a presente tese visa contribuir para a literatura, demonstrando que a adoção de padrões internacionais de contabilidade influencia as relações entre saldo de caixa, qualidade da informação contábil e custo de capital nos países da América Latina, emergindo *insights* frutíferos para pesquisas futuras.

Palavras-chave: saldo de caixa, *accruals*, custo de capital, IFRS, América Latina.

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ABSTRACT

This thesis aims to explore the relations between cash holdings, accounting quality and cost of capital in the context of IFRS adoption in Latin America. In the first essay, we verified the effect of IFRS adoption on accounting quality, especially, earnings management practices. The results show that the adoption of IFRS standards reduced the scope of earnings management practices in Latin American firms. The results also show that IFRS adoption has decreased cash holdings in these firms, as a consequence of higher quality standards. Additional findings suggest that the benefits of IFRS adoption is more pronounced in non-ADR firms since ADR firms present strong incentives to improve the level of accounting information quality. In the second essay, we analyzed the effects of IFRS adoption in the relationship between cash holdings and the cost of capital in Latin American firms. Our findings demonstrated that IFRS adoption impacted the relationship between cash holdings and cost of equity in Latin American firms. That is, when the firms increase cost of equity post-IFRS adoption, they also increase cash levels. Additional analysis demonstrated that IFRS adoption impacted cost of equity only in non-internationalized firms since these firms are more likely to face challenges in relation to the cost of capital than its counterparts. For the cost of debt, we did not find significant results since creditors already have their own mechanisms for loans guarantees. Finally, in the third essay, we analyzed whether discretionary accruals measured by gross income are value relevant in the context of IFRS adoption, comparing with discretionary accruals measured by net income. In addition, we analyzed whether discretionary accruals measured by gross income have complementary information to cash holdings, impacting value relevance. The results demonstrated that discretionary accruals measured by gross income influences value relevance and, the results are sensitive to the context of IFRS adoption. For discretionary accruals measured by net income, we did not find significant results. Additional findings suggest that in context of better accounting quality, the information related to gross income became more reliable, being a better way to predict future performance of firms than cash holdings. In general, this thesis seeks to contribute to literature demonstrating that the adoption of IFRS standards influences the relations between cash holdings, accounting quality and cost of capital in Latin American countries, emerging fruitful insights for future research.

Keywords: Cash holdings. Accruals. Cost of capital. IFRS. Latin America.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADR – American Depositary Receipt

B3 – *Brasil, Bolsa, Balcão* (Brazilian Stock Exchange)

BIG 4 – Deloitte, Ernst & Young, KPMG and Pricewaterhouse Coopers

CAPM – Capital Asset Pricing Model

CNMV – *Comisión Nacional del Mercado de Valores*

CPI – Consumer Price Index

EMBI - *J.P. Morgan* Emerging Market Bond Index

E.U. – European Union

GDP – Gross Domestic Product

GMM – Generalized Method of Moments

IAS – International Accounting Standards

IASB – International Accounting Standards Board

IFRS – International Financial Reporting Standards

Ke – Cost of Equity

Ki – Cost of Debt

NYSE – New York Stock Exchange

ROA – Return on Assets

SEC – U.S. Securities and Exchange Commission

T-Bond – Treasury Bond U.S.

TRBC – The Refinitiv Business Classifications

U.K. – United Kingdom

U.S. – United States of America

USD – American dollars

VIF – Variance Inflating Factor

WACC – Weighted Average Cost of Capital

WGI – Worldwide Governance Indicators

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INTRODUCTION

Cash refers to immediate liquid assets that can be used at any time in payments of various types (Assaf Neto, 2012). Cash also includes cash equivalents, which are short-term and highly liquid investments, that is, they can be immediately converted into cash and present an insignificant risk of change in value (International Accounting Standards Board [IASB], 2021).

Cash holdings management is one of the most important decisions in a firm (Chen & Mahajan, 2010). Cash holdings have occupied relevant amounts in the balance sheets of firms in different parts of the world, increasing the importance of decisions regarding these resources.

Magerakis, Siriopoulos and Tsagkanos (2015) showed that the U.K. non-financial public companies, in the period 1980-2012, maintained the average proportion of cash and cash equivalents in relation to total assets at 15.39%. For North American firms, Bates, Kahle and Stulz (2009) demonstrate that this proportion is 23.2%, in 2006. Dylewski (2010) analyzed Latin American public companies, from 1995 to 2009, and found that there is an increasing performance of liquid assets in relation to total assets, with some fluctuations due to instabilities in the economic scenario.

The amount of cash accumulated by firms has traditionally been justified by the transactional reason, that is, the cash retention occurs at the expense of the needs of the firms' operational activities (Baumol, 1952; Miller & Orr, 1966).

Evidence has shown that the existence of information asymmetry makes it difficult to raise external resources, making it more expensive for firms, due to adverse selection problems, so that companies prefer to keep their resources in cash (Dittmar, Mahrt-Smith & Servaes, 2003; García-Teruel & Martínez-Solano, 2008; García-Teruel, Martínez-Solano & Sánchez-Ballesta, 2009), protecting the investments and the operation of the firms, which is called by precautionary motive (Opler, Pinkowitz, Stulz & Williamson, 1999).

Hail, Leuz and Wysocki (2010) highlight that less informed investors tend to remain afraid to invest in markets where the information is asymmetrical, as they are unaware of the information relevant to their decisions.

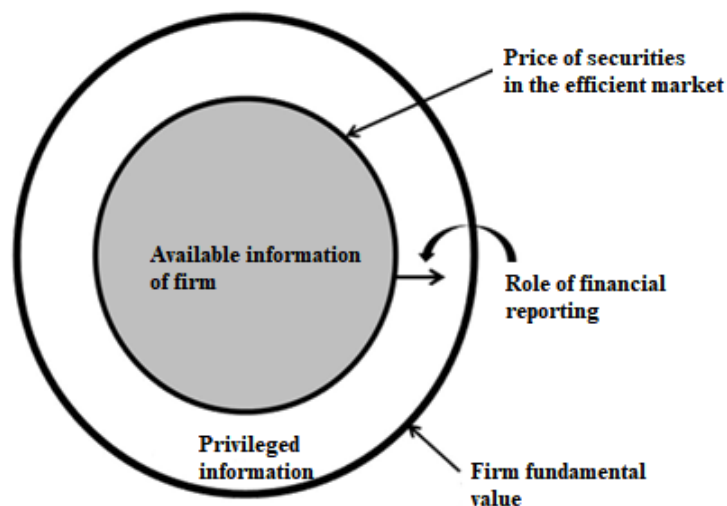
Informational asymmetry occurs when one of the participants in a business has better information than the other participant (s), which can be characterized by adverse selection or moral hazard. The first type occurs when one or more participants in a market (or potential) transaction have information advantage over other participant (s). The second is moral risk is

characterized by the segregation between ownership and control, which can cause agency conflicts, by the search for the managers' own interests (Scott, 2009, p. 13).

Scott (2009, p. 116) highlights that Accounting plays an important role in mitigating informational asymmetry, acting as a mechanism to control adverse selection, aiming to improve the functioning of markets and reduce their incompleteness.

Scott (2009, p. 116) also complements that the role of financial reports is to convert privileged information into information available to users, expanding the internal circle (Figure 1). However, this fails to achieve the firm's fundamental value since the cost of eliminating all internal information is "astronomical". For this reason, the firm's fundamental value is seen as a theoretical concept (Scott, 2009, p. 116).

Figure 1 Role of financial reporting



Source: adapted from Scott (2009, p. 117).

In this context, the adoption of International Financial Reporting Standards (IFRS) plays an important role in reducing information asymmetry. The adoption of IFRS standards is one of the most important regulatory changes in Accounting, mainly due to the fact that these standards require clearer and more understandable information, aiming to assist the users in their decision-making process (Barbosa Neto, Dias & Pinheiro, 2009).

Empirical evidence has shown that, in general, benefits from the adoption of IFRS, due to the mitigation of information asymmetry, as evidenced in several articles, such as, Soderstrom and Sun (2007), Barth, Landsman and Lang (2008), Yurisandi and Puspitasari (2015). Despite that, the impacts of adopting IFRS standards have been widely explored in

Anglo-Saxon and European countries (Nobes, 2011). In Latin America, it is still a recent phenomenon, emerging opportunities for research (García, Alejandro, Sáenz & Sánchez, 2017; Pelucio-Grecco, Geron, Grecco & Lima, 2014).

Fortin, Barros and Cutler (2010, p. 92) point out that the stability and growth of most Latin American economies experienced during 2000s were crucial to the beginning of the process of implementing international standards. In addition, the authors added that, although these countries are relatively underdeveloped, capital markets have experienced significant relative growth in the past two decades, encouraging an improvement in financial reporting (Fortin et al., 2010, p. 15).

Aiming to explore the relations between cash holdings, accounting quality and cost of capital in the context of IFRS adoption in Latin America, this thesis is structured into three essays.

In the first essay, we verified the effect of IFRS adoption on accounting quality of non-financial public firms in Latin America from 2005 to 2018. The results show that the adoption of IFRS standards reduces the scope of earnings management practices. The results also show that IFRS adoption has decreased cash holdings in Latin American firms. That is, companies with higher quality maintain lower cash levels, emerging economic consequences by demonstrating that better quality of financial reports could play a role to reduce the effects of asymmetric information between firms and investors (García-Teruel et al., 2009).

Additional findings suggest that the benefits of IFRS adoption is more pronounced in non-ADR firms since ADR firms present strong incentives to improve the level of accounting information quality.

In the second essay, we analyzed the effects of IFRS adoption in the relationship between cash holdings and the cost of capital in Latin American firms. Our overall findings demonstrated that IFRS standards might impact the relationship between cash holdings and cost of equity. That is, when the firms increase cost of equity post-IFRS, they also increase cash levels. Consequently, the cost of capital seems to cost more after IFRS adoption and cash holdings became sensitive to the adoption of these standards. For the cost of debt, we did not find significant results since creditors already have their own mechanisms for loans guarantees.

Additional analysis suggests that cost of equity is sensitive to the context of IFRS adoption in non-internationalized firms.

Finally, in the third essay, we analyzed the relations between cash holdings, discretionary accruals and value relevance in non-financial public firms in Latin American from 2005 to 2019. In this sense, we verified whether discretionary accruals measured by gross

income are value relevant in the context of IFRS adoption, comparing with discretionary accruals measured by net income. In addition, we analyzed whether discretionary accruals measured by gross income have complementary information to cash holdings, impacting value relevance. The results demonstrated that discretionary accruals measured by gross income influence value relevance and, the results are sensitive to the context of IFRS adoption. We did not find significant results to discretionary accruals measured by net income. Additional results demonstrated that, in context of better accounting quality, the information of income (in this case, gross income) became more reliable, being a better way to predict future performance of firms than cash holdings.

1. THE EFFECT OF IFRS ADOPTION ON CASH HOLDINGS IN LATIN AMERICA UNDER THE EARNINGS MANAGEMENT PERSPECTIVE

Abstract

The aim of this study is to analyze the effect of mandatory IFRS adoption on cash holdings in Latin America. We also verified the effect of mandatory IFRS adoption on earnings management practices in Latin American firms. We applied robust-GMM regressions in a sample of 7,058 firm-year observations from Brazil, Argentina, Chile, Colombia, Mexico and Peru in the period of 2005 to 2018. The findings demonstrate that the adoption of IFRS standards has decreased earnings management practices in Latin American firms and these firms are reducing its cash holdings, suggesting that better quality of financial reports could play a role to reduce the effects of asymmetric information. Additional analysis demonstrates that the benefits of IFRS adoption is more pronounced in non-ADR firms once ADR firms has already demonstrated strong incentives to improve the level of accounting information quality. Our study seeks to contribute to the cash management literature, demonstrating that cash holdings are sensitive to accounting information quality since better quality of financial reports though the IFRS adoption could mitigate the effects of asymmetric information even in low investor protection countries, as Latin America. Our findings also contribute to the expansion of studies in this context, corroborating with previous evidence that incentives have a play on the effectiveness of IFRS standards.

Keywords: Cash Holdings. IFRS. Earnings Management. Latin America. Accounting Quality.

1.1 Introduction

Cash holdings management is one of the most important decisions in a firm (Chen & Mahajan, 2010). Opler, Pinkowitz, Stulz and Williamson (1999) highlight that cash holdings are impacted by three main factors. The first is related to transaction costs, in which larger amounts of cash tend to reduce that costs. The second is related to informational asymmetry, which makes external financing more expensive. Finally, the last factor is associated with agency problems under uncertainty and risk, increasing cash holdings by firms (Dittmar, Mahrt-Smith & Servaes, 2003; Ferreira & Vilela, 2004).

Several studies have investigated the role of informational asymmetry in cash decisions (Dittmar et al., 2003; Farinha, Mateus & Soares, 2018; García-Teruel & Martínez-Solano, 2008;

García-Teruel, Martínez-Solano & Sánchez-Ballesta, 2009; Sun, Yung & Rahman, 2014). The results converge to a positive relationship between cash holdings and asymmetric information.

In the presence of lower earnings quality, there is a perception that asymmetric information is more accentuated (Sun et al., 2014). Consequently, managers need to maintain a liquidity buffer to protect against a possible lack of cash or to cover future investment needs (García-Teruel et al., 2009).

In this sense, Accounting plays an important role in reducing information asymmetry, notably through the adoption of International Financial Reporting Standards (IFRS). Lourenço and Castelo Branco (2015) indicate that, with the IFRS adoption, a set of rules gives rise to a set of principles guided by the useful information provided by financial reports.

Empirical evidence has shown that the benefits of IFRS adoption for investors are mixed (Brown, 2011), especially because the adoption of these standards can occur unevenly between countries, affecting the quality of financial reports, due to factors such political and legal system, tax, capital market development, property, and capital structure (Holthausen, 2009; Nobes, 2011; Soderstrom & Sun, 2007). Other associated factor is the level of enforcement in the adopting countries (Ball, 2006; Christensen, Hail & Leuz, 2013; Li, 2010).

The effects of adopting IFRS have been widely seen in Anglo-Saxon and European countries (Nobes, 2011). Latin American countries continue to be less explored since the adoption of these standards (García, Alejandro, Sáenz & Sánchez, 2017). Besides that, Latin American countries has experienced significant relative growth rates in the past two decades, encouraging the improvement of corporate financial reports to possibility investors the same level of protection that they enjoy in major world markets (Fortin, Barros & Cutler, 2010, p. 15).

Rathke, Santana, Lourenço and Dalmácio (2016) demonstrated that IFRS adoption tends not to be sufficient to improve the accounting information quality in Brazil and Chile, when compared to Anglo-Saxon and Continental European economies. Despite of, García et al. (2017) found evidence that changes from local accounting standards to IFRS standards provided an increase in value relevance of Latin American firms.

Montoya (2018) verified a widely sample of Latin American and Caribbean firms from 2006 to 2014 and found evidence that, during the period of IFRS application, companies report lower earnings management levels, increasing accounting information quality. Under the view of earnings opacity, Mongrut and Winkelried (2019) provided evidence that the adoption of IFRS standards tend not to be able to reduce the degree of opacity in Latin American firms.

The aim of this study is to analyze the effect of mandatory IFRS adoption on cash holdings in Latin American firms. For this purpose, we analyze a sample of 734 firms from Brazil, Argentina, Chile, Colombia, Mexico, and Peru for the period of 2005 to 2018. In addition, we analyzed the incremental effect of the accounting information quality, through earnings management practices, on cash holdings in the context of mandatory IFRS adoption in Latin America.

The overall results show that the adoption of IFRS standards has reduced the scope of earnings management practices in Latin America. Furthermore, the findings also demonstrate that companies with higher information quality (though IFRS adoption variable) maintain lower cash levels, suggesting that better quality of financial reports could play a role to reduce the effects of asymmetric information in Latin American firms.

Additional analysis demonstrates that the benefits of IFRS adoption is more pronounced in non-ADR firms. That is, the presence of ADR has already demonstrated strong incentives to improve the level of accounting quality.

Therefore, the study seeks to contribute to the cash management literature, demonstrating that cash holdings are sensitive to accounting quality and thus better quality of financial reports though the IFRS adoption could play a role to reduce the effects of asymmetric information even in low investor protection countries. The findings also contribute to the expansion of studies in Latin America, corroborating with previous evidence that incentives have a play on the application of IFRS standards.

1.2 Theoretical Background and Hypotheses Development

1.2.1. Firm decisions on corporate cash holdings

Management decisions regarding cash holdings would be irrelevant whether the capital markets were perfects since the companies could raise funds at any time, with no opportunity cost and the access to financing would not have additional costs (Opler et al., 1999). However, the world of imperfect markets turns strategic decisions regarding cash holdings.

Kim, Mauer and Sherman (1998) and Opler et al. (1999) argue that cash levels need to be actively balanced to maximize the net benefits, that is the benefits must be balanced against the costs that these resources impose to the firms. The determinants of cash holdings are related to some benefits or costs, which the variations imply in a change of the optimal level of cash.

Kim et al. (1998) developed a model of optimal cash holdings based on a trade-off between the benefit of taking future investment opportunities through internal funds and the costs of maintaining cash balances. They analyzed 915 U.S. firms listed in the Compustat database from 1995 to 1994 through panel data regressions. The results showed that firms with higher growth opportunities, higher market-to-book ratios, higher cash flow volatility and small size lead to higher levels of cash holdings. The authors also found a relation between liquidity and the impact of future economic conditions. The findings support the argument that firms tend to maintain cash holdings as a way of anticipating future profitable investment opportunities.

Opler et al. (1999) analyzed 1,048 US firms listed on the Compustat database from 1971 and 1994. They found that firms with greater investment opportunities, smaller size, and higher cash flow risks hold relatively high ratios of cash holdings, providing supportive evidence of the trade-off model of cash holdings. The authors argue that firms that have the greatest access to capital markets tend to hold lower levels of cash holdings. In this sense, the evidence supports the view that firms hold cash as precautionary reasons especially when external financing is costly.

Dittmar et al. (2003) analyzed 11,591 firms from 45 countries around the World listed in the Global Vantage database from 1997 to 1999. They found that agency problems are important in determining cash balances, demonstrating that cash levels of low investor protection's countries tend to be up to twice those countries with these rights are higher.

In the analysis of E.U. public firms from 1987 to 2000, Ferreira and Vilela (2004) demonstrated that cash holdings are, among other determinants, positively related to investment opportunities and cash flow and negatively related to size, leverage, and cash substitutes, corroborating to the findings of Opler et al. (1999).

Ferreira and Vilela (2004) also found that the level of development of the capital market is negatively related to the level of cash holdings due to the transaction costs of raising additional resources. Consequently, firms tend to accumulate higher levels of cash holdings for precautionary reasons. Ozkan and Ozkan (2004) analyzed 1,029 U.K. public firms from 1984 to 1999 and found similar evidence.

García-Teruel et al. (2009) examined the effects of informational asymmetry and adverse selection costs on cash holdings of 65 Spanish non-financial companies listed in the *Comisión Nacional del Mercado de Valores* (CNMV) from 1995 to 2001. The results showed that accounting quality information influences cash holdings. That is, companies with higher quality maintain lower cash levels, demonstrating economic implications that better quality

tends to reduce the effects of asymmetric information and the costs of adverse selection in obtaining external financing. Besides, the results also indicated that a higher generation of operating cash flow increases the amount of cash.

Sun et al. (2014) analyzed 8621 US firms listed on the Compustat database from 1980 to 2005, aiming to identify the impact of accounting quality on the cash holdings. The main results showed that a low disclosure of earnings quality by managers causes an increase in the cash holdings, which is consistent with García-Teruel et al. (2009). The authors also found that low accounting quality has a negative impact on the value of cash, due to information asymmetry and agency costs, since investors tend to discount the value of cash holdings when managers are likely to use the excess of cash with less profitable acquisitions or adopting diversification practices for their benefit. These findings demonstrate that these two phenomena coexist, and these are not necessarily mutually exclusive (Sun et al., 2014).

In the same way, Farinha et al. (2018) provide evidence to support prior studies. The authors examined U.K. public firms from 1998 to 2015. The findings suggest that cash holdings are positively related to asymmetric information. That is, firms tend to keep cash balances to not overlook profitable investment opportunities (Myers & Majluf, 1984).

1.2.2. The effects of IFRS adoption on the accounting information quality

The IFRS adoption for public firms around the World is one of the most significant regulatory changes in the history of Accounting (Daske, Hail, Leuz & Verdi, 2008). Nowadays, more than 160 countries have already adopted these standards, improving the greater comparability and the quality of the financial reports, assisting investors and other market participants in their economic decisions (International Financial Reporting Standards Foundation [IFRS], 2020).

Some studies argue that IFRS adoption could occur unequally between the countries (Holthausen, 2009; Soderstrom & Sun, 2007) since the accounting information quality is dependent on the context in which it is based (Dechow, Ge & Schrand, 2010; Paulo, 2007; Scott, 2009).

Ball, Kothari and Robin (2000) and Bushman and Piotroski (2006) highlight that the quality of financial reports is directly influenced by the institutional environment, especially in countries of code law origin, as they are dependent on the legal system. Whether there are legal system's ambiguities, the enforcement becomes weak, reducing the incentives for managers to

disclose reliable and timely information (Lopes & Walker, 2008) and, thereby, reducing the information quality in the accounting numbers (Leuz, Nanda & Wysocki, 2003). Brown (2011) points out that empirical evidence has shown that the benefits of adopting IFRS standards for investors tend to be mixed.

Soderstrom and Sun (2007) provided a review study about the effects of IFRS adoption in European countries. They found that, in general, studies have pointed out that IFRS adoption improves accounting information quality. The authors highlight that accounting standards, incentives and political and legal systems influence directly the accounting information quality, and consequently the way of IFRS standards are implemented, generating different economic consequences.

Barth, Landsman and Lang (2008) examined whether the application of International Accounting Standards (IAS) is associated with an increase in accounting quality through a broad sample of 327 firms from 21 countries on the WorldScope database from 1994 to 2003. The authors found that adopting firms generally present an increase in accounting information quality when compared with their counterparts. The results also show that adopting firms evidence an improvement in accounting quality between the pre- and post-adoption periods. The authors highlighted that although they have included research features to mitigate the firm's incentives and economic environment, they cannot be sure that the findings are attributed exclusively to the change in the reporting system.

Jeanjean and Stolowy (2008) analyzed whether the adoption of IFRS affected the earnings management practices of publicly held companies in Australia, the United Kingdom and France. The results showed that Australian and U.K. companies had a decrease in the level of earnings management post-IFRS adoption, improving the accounting information quality, however, in fact, it had an increase in France. These findings evidence that firm's incentives and national institutional factors play a role in framing accounting standards.

Van Tendeloo and Vanstraelen (2005) demonstrated that, in general, the adoption of IFRS standards could not provide a difference in earnings management behavior when compared to local standards for public firms in Germany for the period of 1999 to 2001. Moreover, the findings demonstrated that the increase in earnings smoothing with IFRS adoption is significantly reduced when the firm has a Big 4 auditorship.

Paulo, Girão, Carter and Sousa (2013) analyzed the impact of IFRS adoption on accounting information quality of public firms in Brazil and Europe (Frankfurt, Madrid, Paris, and London) from 2000 to 2011. The findings showed that the IFRS adoption tends not to provide on average an increase in persistence, conservatism, and earnings management

practices. The authors highlight the fact that the results may be influenced by the financial crisis that occurred after 2005, also highlighting the importance of macroeconomic effects in the behavior of the firm's results. This is consistent with Christensen et al. (2013), through the analysis of 56 countries in the period from 2001 to 2009, demonstrated that changes in the application of IFRS standards, notably the levels of enforcement, play a critical role in the improvements observed.

Peluccio-Grecco, Geron, Grecco and Lima (2014) found preliminary evidence of the improvement in accounting information quality in Brazil during IFRS period. Houqe, Easton and Van Zijl (2014) found similar evidence that the IFRS adoption leads to an improvement of information quality also in countries with low investor protection. Through the analysis of more than 500 French, German and Swiss listed companies for 2003 and 2011, the authors found a significant improvement in both forecast accuracy and forecast dispersion post-IFRS.

Rathke et al. (2016) demonstrated that Latin American (Brazil and Chile) firms for the period of 2011 to 2012 presented a higher level of earnings management than Anglo-Saxon (U.K. and Australia) and Continental European (France and Germany) firms. The authors highlighted that IFRS adoption and strong incentives by ADR issuers tend not to be sufficient to improve the accounting information quality in the short term. However, Manzano and Conesa (2014) found evidence that IFRS adoption reduced the earnings management in Mexican firms during 1997 to 2009.

1.2.3. Hypotheses development

The IFRS adoption seeks to provide better transparency of the financial statements, reducing the level of information asymmetry between companies and the market, by improving the information content generated by accounting (IFRS, 2020). Ball (2006) points out that the adoption of IFRS has the potential to facilitate the comparability of information between adopters, increase transparency, decrease information costs, and reduce information asymmetry.

Verdi (2006) arguments that better levels of financial reporting can improve investment efficiency by the reduction of information asymmetry in two aspects: (i) between firms and investors, through the reduction of adverse selection costs and thus lower costs of raising funds for firms; and (ii) between investors and managers, through the mitigation of agency conflicts and thus lower shareholder's costs of monitoring managers and improves project selection.

The ideal set of standards varies in each country, being determined according to its history, culture, and legal system (Nobes, 2011). In this sense, accounting information is directly influenced by the context and may cause differences in information content between countries, mainly due to factors related to the managers' incentives, economic agents, law enforcement, ownership and control structure, sources of financing (Ball, 1999; Burgstahler, Hail & Leuz, 2006; Dechow et al., 2010) and due to institutional and capital market characteristics (Ball et al., 2000; Bushman & Piotroski, 2006; Pope & Walker, 1999).

Consequently, improving the information quality through the adoption of IFRS standards would only be significant in countries with incentives to adopt these standards (Christensen, Lee, Walker & Zeng, 2015). Despite that, some studies have demonstrated that the benefits of IFRS adoption could also be perceived in low investor countries, including Latin America (Manzano & Conesa, 2014; García et al., 2017; Houqe et al., 2014; Montoya, 2018; Pelucio-Grecco et al., 2014).

Studies have also demonstrated that cash decisions are influenced by the context of information asymmetry and thus higher (lower) level of information asymmetry tends to provide incentives for managers to hold more (less) cash (Farinha et al., 2018; García-Teruel et al., 2009; Sun et al., 2014). Better levels of accounting information may reduce the negative effects of information asymmetries and adverse selection costs, allowing firms to reduce its levels of corporate cash holdings (García-Teruel et al., 2009).

Thus, considering that previous studies demonstrated the benefits of IFRS adoption could also appear in contexts of low investor protection, it is expected that mandatory IFRS adoption could lead to a lower level of cash holdings in Latin America, as stated by H1:

H₁: The mandatory IFRS adoption resulted in a decrease in the level of cash holdings in Latin American public companies.

In addition to the main hypothesis H₁, we propose an additional hypothesis, H₂, which aims to contribute to the explanation of the effects of the accounting information quality under cash holdings, in the context of full adoption of IFRS standards.

We propose that IFRS standards lead to lower levels of earnings management practices, consequently, firms are reducing its levels of asymmetric information and improving accounting information quality, mitigating its financing costs. Consequently, firms with higher levels of accounting information quality (measured by accruals quality) might improve the cash

holdings management, investment efficiency and thus better allocation of resources, reducing its cash levels.

H₂: Lower levels of earnings management lead to lower levels of cash post-IFRS adoption in Latin American public firms.

Thus, in a context of IFRS adoption, it is expected that lower levels of earnings management practices, and consequently higher levels of accounting information quality, will be sufficient to reduce cash holdings in Latin American firms.

1.3 Research Design

1.3.1. Sample and data description

Our sample initially comprises 1,232 public firms from Latin America, considering the six largest economies, that is Argentina, Brazil, Chile, Colombia, Mexico, and Peru from 2005 to 2018.

We excluded financial industry and insurance services since they have operational and cash management differences (Bates, Kahle & Stulz, 2009). We also excluded firm-observations with losses because the calculation of some variables could be subjected to mathematical bias. Besides, firms with losses have specific incentives for earnings management practices and thus managers tend to report even more losses to improve performance in the future by ‘taking a bath’ practice. This behavior could harm the effect of earnings management in our models. Finally, we remove firm-observations with null available information in all period and with negative equity to provide consistency in the estimations.

The final sample comprises 734 public firms, in a total of 7,058 firm-year observations from 2005 to 2018, in an unbalanced panel data. Table 1.1 shows the composition of the final sample.

Table 1.1 Sample description

Description	Firms	Observations
Total public firms	1,232	17,248
(-) financial and insurance firms	(427)	(5,978)
(=) initial sample	805	11,270
(-) null firm-year observations in all years		(1,840)
(-) firm-year observations with negative net income	(71)	(1,906)
(-) firm-year observations with negative equity		(466)
(=) final sample	734	7,058

Source: the authors.

Final sample comprises 734 non-financial public firms from Latin America.

Latin American countries' sample includes Argentina, Brazil, Chile, Colombia, Mexico and Peru. Financial information was collected in USD.

Unbalanced panel data contains 7,058 firm-year observations from 2005 to 2018.

Table 1.2 shows the final sample segregated according to country and industry classifications. The most representative countries of the sample are Brazil (30.8%) and Chile (21.7%). The most representative industries are Basic Materials (18.9%), Consumer cyclical (19.3%) and Consumer non-cyclical (20.7%).

Table 1.2 Sample classification

Panel (a): Sample classification by country

Country	Number of obs	Freq. %
Argentina	711	10.07%
Brazil	2,177	30.84%
Chile	1,531	21.69%
Colombia	432	6.12%
Mexico	1,054	14.93%
Peru	1,153	16.34%
Total	7,058	100%

Panel (b): Sample classification by industry

Industry	Number of obs	Freq. %
Industrials	1,123	15.91%
Basic materials	1,333	18.89%
Consumer non-cyclical	1,451	20.56%
Utilities	1,153	16.34%
Energy	198	2.81%
Consumer cyclical	1,364	19.33%
Healthcare	187	2.65%
Technology	113	1.60%
Telecommunications	136	1.93%
Total	7,058	100%

Source: the authors.

Industry classification of TRBC Economic Sector Name.

Final sample comprises 7,058 firm-year observations from 2005 to 2018.

Table 1.2 shows also that the Colombian firms present the lowest number of firm-year observations (432), which corresponds to 6.12% of the final sample. Regarding the industry classification, the lowest number of firm-year observations comprises Technology and Telecommunications, both around 2% of the final sample.

1.3.2. Variables and econometric model

The dependent variable is corporate cash holdings, defined as the ratio of cash and cash equivalents¹ divided by total assets, following previous studies as Bates et al. (2009), García-Teruel et al. (2009) and Ozkan and Ozkan (2004).

The interest variable is a dummy for mandatory IFRS adoption by country. The variable takes the value one (1) for the years post-IFRS adoption and zero (0) for prior years. We choose the period pre- and post- IFRS due to the fact that most companies are not to prepared to the short period of the implementation of the IFRS standards (IFRS, 2020).

Table 1.3 IFRS mandatory adoption by sample country

Country	Stock Exchange	Year
Argentina	<i>Bolsa de Comercio de Buenos Aires</i>	2012
Brazil	<i>B3 - Brasil, Bolsa, Balcão</i>	2010
Chile	<i>Bolsa de Santiago</i>	2009
Colombia	<i>Bolsa de Valores de Colombia</i>	2015
Mexico	<i>Bolsa Mexicana de Valores</i>	2012
Peru	<i>Bolsa de Valores de Lima</i>	2012

Source: IFRS (2020b).

The accounting quality could be measured by a variety of attributes, including persistence, smoothness, timeliness, accruals, loss avoidance, investor responsiveness (Dechow et al., 2010). We did not choose a specific measure of accounting quality, but a general one that aggregates more information. Dechow (1994) points that earnings are a summary of performance produced by the firm under the accrual's basis of accounting. Reported earnings consist of cash earnings and non-cash earnings. While the first is measured by cash flow from operating activities, accruals are accounting adjustments with no direct cash flow consequences.

¹ If the firm did not have available information of cash and cash equivalents, we consider cash and short-term investments for these years.

Therefore, earnings are an aggregate of operating cash flows and total accruals (Hribar & Collins, 2002).

We calculated the total accruals (TA) as the difference between net income and cash flow from operating activities (Dechow et al., 2010; Healy, 1985; Sloan, 1996). After, we applied the model proposed by Kothari, Leone and Wasley (2005) to calculate the discretionary (DA) component. This model includes the return on assets (ROA) to control the influence of different levels of performance between firms. The descriptive statistics are reported in Appendix A.

$$TA_{i,t} = \delta_0 + \delta_1(1/ASSETS_{i,t-1}) + \delta_2(\Delta SALES_{i,t} - \Delta AR_{i,t}) + \delta_3 PPE_{i,t} + \delta_4 ROA_{i,t} + u_{i,t} \quad (1.1)$$

Where,

$TA_{i,t}$ is total accruals of firm i in year t , weighted by total assets of firm i in year $t-1$;

$ASSETS_{i,t-1}$ is total assets of firm i in year $t-1$;

$\Delta SALES_{i,t}$ is net revenue for year t minus net revenue for year $t-1$ for firm i , weighted by total assets for firm i in year $t-1$;

$\Delta AR_{i,t}$ is net receivables of year t minus net receivables of year $t-1$ of firm i , weighted by total assets of firm i in year $t-1$;

$PPE_{i,t}$ is net property, plant and equipment of firm i in year t ;

$ROA_{i,t}$ is net income of firm i in year t divided by total assets of firm i in year t ;

$u_{i,t}$ is the regression error term.

The model was calculated by cross-sectional regression for the sample period as previous studies (Barth et al., 2008; García-Teruel et al., 2009; Jones, 1991; Verdi, 2006) to obtain the residues of the regression, specifically, the discretionary accruals component (DA).

After the estimation of the DA component (Appendix B), we obtained the absolute value of the residue, $|DA|$, as an inverse measure of the accounting information quality, that is, a greater magnitude of discretionary accruals indicates a higher level of earnings management (Barth et al., 2008; Chen, Tang, Jiang & Lin, 2010; Dechow et al., 2010; García-Teruel et al., 2009; Rathke et al., 2016; Van Tendeloo & Vanstraelen, 2005).

We highlight the limitation inherent to the accrual estimation process. The regression obtained R^2 coefficient of 8.4%, which suggests that most of the variation in accruals is due to the discretionary component, carrying exaggerated frequencies in these components (Ball, 2013). Consequently, the behavior that is not actually managed by the firm tends to be classified as discretionary, even if no discretion has been exercised. However, measuring the accounting information quality is inherently difficult since the estimation models are not able to segregate

the dependence of the decision context and the fundamental performance of the firms (Christensen et al., 2015; Dechow et al., 2010).

Control variables include factors traditionally explored in the cash holdings literature, which can affect the cash management. In addition, we include variables related to incentives of firms that could affect the earnings management practices. Finally, we also control country incentives and macroeconomic effects, which tend to affect firms as well as market.

Table 1.4 shows the firms' control variables related to the determinants of cash holdings, based on previous literature.

Table 1.4 Cash control variables

Variable	Description	Calculation	Expected coefficient	Theoretical reference
SIZE	Firm size	Natural logarithm of total assets	(-)	Economies of scale favor larger firms since they are more diversified hence lower probability of being in financial distress (Rajan & Zingales, 1995). Thus, larger firms hold less cash (Bates et al., 2009; Opler et al., 1999).
GOP	Growth opportunities	Ratio of company market value and book value	(+)	Firms with greater growth opportunities are able to maintain higher cash levels to carry out investment projects (Kim et al., 1998; Opler et al., 1999; Ozkan & Ozkan, 2004). Firms with greater growth opportunities are subject to have greater costs of financial distress (Bates et al., 2009).
FLOW	Operating cash flow	Ratio of cash from operating activities and total assets	(+)	Firms with higher cash flows have higher cash levels (Bates et al., 2009; Ferreira & Vilela, 2004; Opler et al., 1999; Ozkan & Ozkan, 2004).
LEV	Leverage	Ratio of total debt and total assets	(+/-)	In case of the debt is high enough, firms will hold less cash to reduce leverage (Bates et al., 2009). However, leveraged firms are expected to hold more cash to reduce the probability of financial distress (Ferreira & Vilela, 2004).
NWC	Net working capital	Current net assets minus cash and cash equivalents, divided by total assets	(-)	Liquid assets can be seen as cash substitutes (Bates et al., 2009; Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004; Opler et al., 1999) since working capital and investments compete for available resources (Fazzari & Petersen, 1993).
CAPEX	Capital expenditures	Ratio of capital expenditures and total assets	(+/-)	Firms with more capital expenditures have more liquid assets (Opler et al., 1999). Capital expenditures tend to increase the debt capacity and reduce the cash demand since the assets created by these expenses can be used as collateral (Bates et al., 2009).

DIV	Dividend payment	Dividend dummy	(-)	Dividend-paying firms are less risky and have greater access to capital markets, reducing cash levels (Bates et al., 2009; Ferreira & Vilela, 2004; Opler et al., 1999).
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Source: the authors.

We include the control of American Depositary Receipts (ADR). Companies that issued ADR are expected to have superior quality even before the mandatory adoption of IFRS standards since they must comply with the requirements of the U.S. Securities and Exchange Commission (SEC), which require more transparency and better information disclosures.

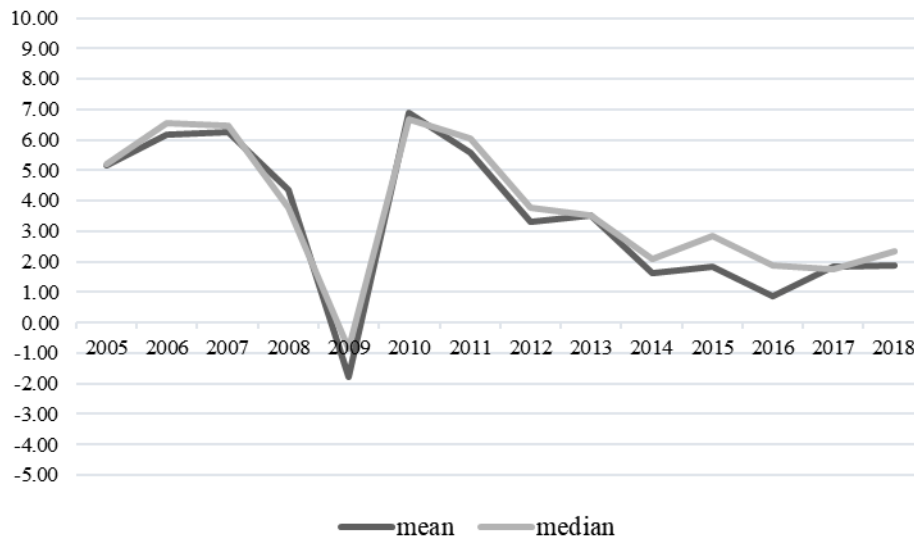
Lang, Lins and Maffett (2012) found that earnings management practices are lower for companies that have securities traded on U.S. markets. Black and Nakao (2017) demonstrated similar results for Brazilian firms in the context of IFRS adoption. We control ADR issuers by a dummy variable that takes one (1) for the years from the date of issuance, or zero (0) if the company does not have issued ADR in the New York Stock Exchange (NYSE).

We include the control of Big 4 auditorship since big audit firms need to protect their reputation, which could affect the propensity of firms audited by them to reduce earnings management practices (Francis & Wang, 2008; Rathke et al., 2016).

The control of macroeconomic events considers the Gross Domestic Product (GDP) growth variable, which is compiled by The World Bank Group (see Appendix C). This variable captures the positive and negative fluctuations in the GDP rate over the years. Then, a decline in the rate is one of the most important characteristics of an indicative of the economic crises' occurrence (Frankel & Saravelos, 2012), which tends to differ among countries (Iatridis & Dimitras, 2013).

Filip and Raffounier (2014) found that drastic changes in the economic environment have a significant impact on companies' earnings management practices, affecting the quality of accounting information. Bliss, Cheng and Denis (2015) found that, in times of crisis, the marginal benefit of resource retention was increased, as a way to firms finance their operations and reduce financial costs. Dylewski (2010) found similar results for Latin American firms. Dahrouge and Saito (2013) demonstrated that high financial costs hamper immediate adjustment to the optimal cash level in periods of crises.

Graph 1.1 illustrates the GDP growth for 2005 to 2018, demonstrating the average values for the sample.

Graph 1.1 GDP growth rates per year

Source: the authors.

Average values of GDP annual growth rate (%) from 2005 to 2018.

Sample contains Argentina, Brazil, Chile, Colombia, Mexico and Peru.

Annual GDP growth rates are available at The World Bank Group database.

Graph 1.1 shows evidence of a higher decline in GDP for the years of global crises, especially in the Subprime Crisis in 2008-2009 (Achim, Borlea & Brebam, 2010). In recent years, although GDP growth has presented positive averages, it has been decreasing with some fluctuations, signaling that crisis continues.

The control of country characteristics, notably enforcement, is consistent with Simnett, Vanstraelen and Chua (2009) and Alrazi, Villiers and Van Staden (2016). Barth et al. (2008) corroborate that the adoption of IFRS tends to improve the quality of accounting information, decreasing earnings management practices in companies. However, the authors emphasize that incentives and the institutional environment play a relevant role in determining these standards.

The rule of law (LAW) variable measures the perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of the contract enforcement, property rights, the policy and the courts, as well as the likelihood of crime and violence (Kaufmann, Kraay & Mastruzzi, 2010, p. 4).

Finally, we also include the control of corruption (CORRUPT) variable. It measures the perceptions of the extent to which public power is exercised for private gain and own interests (Kaufmann et al., 2010, p.4).

These variables are compiled by The World Bank Group, at the initiative of the Worldwide Governance Indicator (WGI) project. Both varies in a scaled from -2.5 (weak) to 2.5 (strong). The scores for each sample country are available in Appendix D and E.

The summary of all variables, including the name, description and database source is available in Appendix F. The final sample was winsorized at 0.1 percentile and 99.9 percentile, as previous studies (Barth et al., 2008; Dechow et al., 2010; Dittmar et al., 2003; Kothari et al., 2005; Naranjo, Saavedra & Verdi, 2016). We highlight that variables from the World Bank database and dummies were not winsorized.

In summary, based on previous studies and on the inclusion of additional variables, we firstly verified whether IFRS adoption standards influence the earnings management practices in Latin American firms, as stated by equation 1.2.

$$\begin{aligned} |DA|_{i,t} = & \beta_0 + \beta_1 IFRS_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 DIV_{i,t} + \beta_4 LEV_{i,t} + \beta_5 FLOW_{i,t} \\ & + \beta_6 NWC_{i,t} + \beta_7 CAPEX_{i,t} + \beta_8 GOP_{i,t} + \beta_9 AUDIT_{i,t} + \beta_{10} ADR_{i,t} \\ & + \beta_{11} GDP_{i,t} + \beta_{12} LAW_{i,t} + u_{i,t} \end{aligned} \quad (1.2)$$

Where,

$|DA|_{i,t}$ is absolute discretionary accruals from Kothari et al. (2005) model of firm i in year t ; $IFRS_{i,t}$ equals to 1 (one) from the year t of mandatory IFRS adoption and, 0 (zero) before the mandatory adoption;

$SIZE_{i,t}$ is the natural logarithm of total assets of firm i in year t ;

$DIV_{i,t}$ is the dividend dummy that takes 1 if the firm i presented cash-dividend payment in the year t or 0, otherwise;

$LEV_{i,t}$ is the ratio of total debt of firm i in the year t and total assets of firm i in the year t ;

$FLOW_{i,t}$ is the ratio of cash from operating activities of firm i in the year t and total assets of the firm i in the year t ;

$NWC_{i,t}$ is the current net assets minus cash and short-term investments of firm i in the year t , divided by total assets of firm i in the year t ;

$CAPEX_{i,t}$ is the ratio of capital expenditures of firm i in the year t and total assets of firm i in the year t ;

$GOP_{i,t}$ is the ratio of company market value of firm i in the year t and book value of firm i in the year t ;

$AUDIT_{i,t}$ is the dummy variable that takes 1 if the firm i is audited by big-4 audit firms in the year t and 0, otherwise;

$ADR_{i,t}$ is the dummy variable that takes 1 if the firm i has ADR listing at NYSE stock exchange in the year t and 0, otherwise;

$GDP_{i,t}$ is the gross domestic product growth in the year t according to the country of firm i ;

$LAW_{i,t}$ is the rule of law range from -2.5 (weak) to 2.5 (strong) in the year t according to the country of firm i ;

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}, \beta_{12}$ are the estimated coefficients in the regression;

$u_{i,t}$ is the regression error term.

Besides, to test the main hypothesis of the study, we propose the following equation 1.3:

$$\begin{aligned} CASH_{i,t} = & \beta_0 + \beta_1 |DA|_{i,t} + \beta_2 IFRS_{i,t} + \beta_3 IFRS_{i,t} x |DA|_{i,t} + \beta_4 SIZE_{i,t} + \\ & \beta_5 DIV_{i,t} + \beta_6 LEV_{i,t} + \beta_7 FLOW_{i,t} + \beta_8 NWC_{i,t} + \beta_9 CAPEX_{i,t} + \beta_{10} GOP_{i,t} + \\ & \beta_{11} AUDIT_{i,t} + \beta_{12} ADR_{i,t} + \beta_{13} GDP_{i,t} + \beta_{14} LAW_{i,t} + u_{i,t} \end{aligned} \quad (1.3)$$

Where,

$CASH_{i,t}$ is corporate cash holdings of the firm i in the year t ;

$|DA|_{i,t}$ is absolute discretionary accruals from Kothari et al. (2005) model of firm i in year t ;

$IFRS_{i,t}$ equals to 1 (one) from the year of mandatory IFRS adoption and, 0 (zero) before the mandatory adoption;

$IFRS_{i,t} \times |DA|_{i,t}$ is the interaction variable of IFRS of firm i in year t and DA of firm i in year t ;

$SIZE_{i,t}$ is the natural logarithm of total assets of firm i in year t ;

$DIV_{i,t}$ is the dividend dummy that takes 1 if the firm i presented cash-dividend payment in the year t or 0, otherwise;

$LEV_{i,t}$ is the ratio of total debt of firm i in the year t and total assets of firm i in the year t ;

$FLOW_{i,t}$ is the ratio of cash from operating activities of firm i in the year t and total assets of the firm i in the year t ;

$NWC_{i,t}$ is the current net assets minus cash and short-term investments of firm i in the year t , divided by total assets of firm i in the year t ;

$CAPEX_{i,t}$ is the ratio of capital expenditures of firm i in the year t and total assets of firm i in the year t ;

$GOP_{i,t}$ is the ratio of company market value of firm i in the year t and book value of firm i in the year t ;

$AUDIT_{i,t}$ is the dummy variable that takes 1 if the firm i is audited by big-4 audit firms in the year t and 0, otherwise;

$ADR_{i,t}$ is the dummy variable that takes 1 if the firm i has ADR listing at NYSE stock exchange in the year t and 0, otherwise;

$GDP_{i,t}$ is the gross domestic product growth in the year t according to the country of firm i ;

$LAW_{i,t}$ is the rule of law range from -2.5 (weak) to 2.5 (strong) in the year t according to the country of firm i ;

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}, \beta_{12}, \beta_{13}, \beta_{14}$ are the estimated coefficients in the regression; $u_{i,t}$ is the regression error term.

Based on the H_1 , we expect that the adoption of IFRS standards has influenced the corporate cash holdings ($CASH$) in the Latin American firms. Thus, it is expected a negative β_2 coefficient. The incremental analysis (H_2) demonstrates the joint effect of IFRS adoption and accounting information quality ($|DA|$) under the corporate cash holdings ($CASH$) by the coefficient β_3 .

The use of conventional methods of estimating data, as fixed and random effects may not be adequate since unobserved variables can have some variation in time, not being captured by the fixed effect. Besides, some of the regressors could be correlated with past and current values of idiosyncratic error component (Dahrouge & Saito, 2013; Guney, Ozkan & Ozkan, 2003; Ozkan & Ozkan, 2004).

Consequently, we applied Generalized Method of Moments (GMM) dynamic panel data estimations to control for endogeneity by using instruments based on lags of the original regressors, following García-Teruel et al. (2009). We consider control variables related to firm,

industry, macroeconomic and country-level characteristics. We obtained the GMM estimator in two steps to ensure homoscedasticity in the residuals (Arellano & Bond, 1991).

Finally, considering that dynamic panel data is sensitive to the autocorrelation of residues, the Arellano and Bond (1991) test is consistent since we reject the null hypothesis of the absence of the first-order autocorrelation.

1.4 Results Discussion

The descriptive statistics of the sample variables are demonstrated on Table 1.5, considering the period of 2005 to 2018.

Table 1.5 Descriptive statistics

Variable	Number of obs	Mean	Median	Std. Dev.	Min.	Max.
SIZE	7,051	19.965	20.055	2.029	13.755	24.190
CASH	7,032	0.072	0.039	0.091	0.000	0.485
IFRS	7,058	0.596	1.000	-	-	-
LEV	7,051	0.211	0.207	0.159	0	0.622
FLOW	6,763	0.090	0.080	0.089	-0.137	0.432
NWC	7,046	0.043	0.017	0.150	-0.316	0.500
GOP	7,051	1.263	1.013	0.989	0.062	6.226
CAPEX	6,463	0.058	0.045	0.050	0.000	0.269
DIV	5,201	0.935	1.000	-	-	-
AUDIT	6,957	0.689	1.000	-	-	-
ADR	7,058	0.069	0.000	-	-	-
DA	6,851	0.061	0.042	0.063	0.000	0.454
GDP	7,058	3.237	0.030	3.102	-5.919	10.125
LAW	7,058	-0.032	3.257	0.720	-0.886	1.433
CORRUPT	7,058	0.051	-0.315	0.724	-0.928	1.582

Source: the authors.

The number of observations considers the firm-year observations.

SIZE is the natural logarithm of total assets.

CASH is the ratio of cash and cash equivalents and total assets.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

LEV is the ratio of total debt and total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and short-term investments, divided by total assets.

GOP is the ratio of company market value and book value.

CAPEX is the ratio of capital expenditures and total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE.

|DA| is the absolute discretionary accruals obtained from the Kothari et al. (2005) model.

GDP is the gross domestic product growth per year of each country.

LAW is the rule of law range from -2.5 (weak) to 2.5 (strong).

CORRUPT is the control of corruption range from -2.5 (weak) to 2.5 (strong).

Table 1.5 shows the average amount of cash holdings in Latin American firms is 7.2% to total assets during the period. This average value is equivalent to that found for Spanish firms (García-Teruel et al., 2009) and below to firms from countries like U.S., France, U.K., and Japan (Guney et al., 2003). The highest cash amount reached 48.5% to total assets.

The average level of discretionary accruals is 6.1%, which is similar to found by Rathke et al. (2016). The highest value of discretionary accruals reached 45.4%.

The leverage is on average 21% of total assets. The most leveraged firms presented the ratio between total debt and total asset of 62.2% during the period.

While most of the sample firms are audited by Big 4 auditorship (68.9%), only 7% of the firm-year observations comprise ADR firms.

Finally, most of the firm-year observations (93.5%) correspond to dividend-paying firms. The GDP growth rate presents an average value of 3.1%, but it varies from -5.9% to 10.1% for the period of 2005 to 2018.

We ran Shapiro-Wilk test to verify the normality of the variables (Appendix G). Most of the variables do not follow a normal distribution, except for the dummy's variables AUDIT and IFRS, because its p-values are higher than 0.05.

Considering the non-normality of the variables, we ran Spearman correlation coefficients (Appendix H). Only the variables LAW and CORRUPT present higher levels of correlation (0.78). Consequently, we consider LAW and CORRUPT separately in all estimations to not disturb the results.

We ran Mann-Whitney non-parametric test, which is an alternative to the Student's t-test when there is no normality of the variables. The Mann-Whitney test verifies the equality of medians between two groups, instead of means, such as the t-test (Fávero & Belfiore, 2017, p.277). Thus, the medians of the groups were compared pre- and post-IFRS, as presented in Table 1.6.

	Mann-Whitney test	IFRS	
		<i>Pre</i>	<i>Post</i>
CASH	Mean	0.073	0.071
	Median	0.035	0.041
	Std. Dev.	0.094	0.088
	Number of obs	2,835	4,197
	Freq. of obs	40.32%	59.68%

	Z (prob-Z)	-2.154 (0.03)**	
DA	Mean	0.069	0.055
	Median	0.048	0.038
	Std. Dev.	0.069	0.059
	Number of obs	2,732	4,119
	Freq. of obs	39.88%	60.12%
	Z (prob-Z)	-9.181 (0.00)***	

Source: the authors.

CASH is the ratio between cash and cash equivalents and total assets.

|DA| is the absolute discretionary accruals obtained from the Kothari et al. (2005) model.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

Pre refers to the period before mandatory IFRS adoption in each country (IFRS = 0).

Post refers to the period after the mandatory IFRS adoption in each country (IFRS = 1).

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

The Mann-Whitney results show that the group before IFRS adoption differs significantly (at 5%) from its counterparts. The average value of corporate cash holdings is lower post-IFRS adoption. The difference between groups is also significant (at 1%) when we analyze discretionary accruals. The results demonstrate that there is a reduction in the level of discretionary accruals post-IFRS adoption, suggesting an increase in the quality of accounting information.

This technique only provides preliminary evidence that IFRS standards influence the level of corporate cash holdings and the accruals management practices in Latin American firms. Therefore, we ran all the proposed models using GMM regressions with control variables of firm, industry, country and macroeconomic factors.

Table 1.7 demonstrate our first estimations to verify whether IFRS adoption reduced the level of discretionary accruals in the firms analyzed, as previous stated in equation 1.2.

Table 1.7 The effect of IFRS adoption on |DA|

Dependent Variable		DA								
		Model (1)			Model (2)			Model (3)		
Independent Variables		Coef.	P-value		Coef.	P-value		Coef.	P-value	
DA										
	Lag 1.	0.094 <i>0.039</i>	0.016 **		0.098 <i>0.039</i>	0.011 ***		0.095 <i>0.039</i>	0.014 ***	
	IFRS	-0.020 <i>0.004</i>	0.000 ***		-0.020 <i>0.005</i>	0.000 ***		-0.020 <i>0.005</i>	0.000 ***	
	SIZE	0.038 <i>0.007</i>	0.000 ***		0.038 <i>0.007</i>	0.000 ***		0.038 <i>0.007</i>	0.000 ***	
	DIV	0.004 <i>0.007</i>	0.529		0.004 <i>0.007</i>	0.507		0.005 <i>0.007</i>	0.500	
	LEV	0.031	0.261		0.031	0.259		0.032	0.251	

	<i>0.027</i>			<i>0.028</i>			<i>0.028</i>		
FLOW	0.126	0.007	***	0.127	0.008	***	0.124	0.009	***
	<i>0.047</i>			<i>0.047</i>			<i>0.048</i>		
NWC	-0.020	0.488		-0.018	0.533		-0.017	0.557	
	<i>0.029</i>			<i>0.029</i>			<i>0.029</i>		
CAPEX	-0.042	0.334		-0.041	0.355		-0.041	0.354	
	<i>0.044</i>			<i>0.044</i>			<i>0.044</i>		
GOP	-0.001	0.660		-0.001	0.668		-0.001	0.768	
	<i>0.002</i>			<i>0.002</i>			<i>0.002</i>		
ADR	0.013	0.455		0.011	0.515		0.012	0.505	
	<i>0.017</i>			<i>0.017</i>			<i>0.018</i>		
AUDIT	0.017	0.026	**	0.017	0.033	**	0.017	0.033	**
	<i>0.008</i>			<i>0.008</i>			<i>0.008</i>		
GDP				0.000	0.874		0.000	0.937	
				<i>0.000</i>			<i>0.000</i>		
LAW							-0.009	0.360	
							<i>0.010</i>		
Const	-0.752	0.000	***	-0.757	0.000	***	-0.762	0.000	***
	<i>0.137</i>			<i>0.142</i>			<i>0.141</i>		
Industry control	yes			yes			yes		
Number of obs	3512			3512			3512		
Number of groups	519			519			519		
Number of instruments	89			90			91		
Wald Chi2 (prob)	59.79 (0.00)***			59.12 (0.00)***			60.3 (0.00)***		
Mean VIF	1.25			1.25			1.27		
Breusch-Pagan/Cook-Weisberg test (prob)	12.18 (0.00)***			12.47 (0.00)***			23.95 (0.00)***		
Arellano-Bond test Order 1	-9.00 (0.00)***			-9.07 (0.00)***			-9.06 (0.00)***		
Arellano-Bond test Order 2	0.51 (0.61)			0.56 (0.57)			0.50 (0.62)		

Source: the author.

GMM two-step estimation results with robust standards errors.

Robust standards errors are in italics.

Model (1) includes firm-level and industry control variables.

Model (2) includes firm-level, industry and crisis control variables.

Model (3) includes firm-level, industry, crisis, country-level (rule of law) control variables.

Industry control was omitted by the GMM estimation in all regressions.

|DA| is the absolute discretionary accruals obtained from the Kothari et al. (2005) model.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

LEV is the ratio of total debt and total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and short-term investments, divided by total assets.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

GDP is the gross domestic product growth per year of each country.

LAW is the rule of law range from -2.5 (weak) to 2.5 (strong).

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Table 1.7 shows that IFRS adoption reduced the level of absolute discretionary accruals in Latin American firms for 2005 to 2018. After controlling macroeconomic and country effects, the result remains consistent (Model 1, 2 and 3).

As the variable $|DA|$ is an inverse measure of accounting information quality, the negative coefficient indicates that IFRS adoption has reduced the scope of earnings management practices around 2% in these firms, corroborating with the results documented by Pelucio-Grecco et al. (2004) for Brazil, Manzano and Conesa (2014) for Mexico, Houque et al. (2014) for France, Germany and Sweden, García et al. (2017) and Montoya (2018) for a set of Latin American firms.

Some control variables also presented significant coefficients, as firm size, cash flow from operating activities and Big 4 auditorship. Firm size presented a positive coefficient, indicating that larger (smaller) firms tend to present more (less) earnings management practices. This is consistent to the view that larger sized firms tend to manage their earnings to mitigate the pressure of investors and to meet target's analysts (Barton & Simko, 2002; Myers, Myers & Skinner, 2007).

While operating cash flow can be seen as a proxy for expected growth in the firm's operations (Larcker & Richardson, 2004), the results show that growing companies (larger cash flows) tend to exhibit larger accruals (Burgstahler et al., 2006).

The positive coefficient of Big 4 auditorship contradicts the previous evidence (Francis & Wang, 2008; Rathke et al., 2016) since it was expected that firms audited by Big 4 would have less incentive to manage its earnings compared to the firms audited by other audit firms. Despite, Montoya (2018) found a positive coefficient, demonstrating that incentives or pressures in Latin American companies may be relevant factors to increase the use of discretion in accounting numbers.

Future studies could analyze a widely perspective of audit and earnings management in Latin America, mainly because if the market perceives that firms audited by a Big 4 have a higher degree of discretionary accruals, the transaction cost increases a lot for the audit firm, affecting for example brand, service quality and reputation (Almeida & Almeida, 2009; Comunale & Sexton, 2003; Ferguson, Francis & Stokes, 2003).

Some authors have suggested other characteristics impact the audit quality, as partner rotation and audit firm rotation (Chen, Lin & Lin, 2008; Davis, Soo & Trompeter, 2009; Kim, Lee & Lee, 2015; Silvestre, Costa & Kronbauer, 2018). Then, only dichotomous variable could not be able to fully reflect the audit quality service since the evidence suggest that these factors could have adverse effects on earnings quality, especially in case of short-term relationship

between the audit and client firms (Davis et al., 2009) or in case of voluntary audit firm rotate (Silvestre et al., 2018).

Finally, we provide additional regression with the inclusion of CORRUPT rather than LAW (Appendix I panel a) and the results support our previous evidence.

Table 1.8 shows the effect of IFRS standards on cash holdings to test our main hypothesis (Equation 1.3).

Table 1.8 Cash holdings and IFRS adoption

Dependent Variable	CASH								
	Model (1)			Model (2)			Model (3)		
Independent Variables	Coef.	P-value		Coef.	P-value		Coef.	P-value	
CASH									
Lag 1.	0.379	0.000	***	0.383	0.000	***	0.382	0.000	***
	<i>0.059</i>			<i>0.060</i>			<i>0.059</i>		
IFRS	-0.013	0.002	***	-0.013	0.002	***	-0.013	0.002	***
	<i>0.004</i>			<i>0.004</i>			<i>0.004</i>		
SIZE	0.012	0.050	**	0.012	0.059	*	0.012	0.072	*
	<i>0.006</i>			<i>0.006</i>			<i>0.006</i>		
DIV	-0.004	0.425		-0.004	0.422		-0.004	0.398	
	<i>0.005</i>			<i>0.005</i>			<i>0.005</i>		
LEV	0.010	0.704		0.011	0.667		0.013	0.634	
	<i>0.026</i>			<i>0.027</i>			<i>0.027</i>		
FLOW	0.182	0.000	***	0.185	0.000	***	0.187	0.000	***
	<i>0.029</i>			<i>0.029</i>			<i>0.029</i>		
NWC	-0.132	0.000	***	-0.131	0.000	***	-0.131	0.000	***
	<i>0.027</i>			<i>0.027</i>			<i>0.027</i>		
CAPEX	-0.265	0.000	***	-0.266	0.000	***	-0.269	0.000	***
	<i>0.048</i>			<i>0.049</i>			<i>0.049</i>		
GOP	0.003	0.452		0.002	0.494		0.002	0.481	
	<i>0.003</i>			<i>0.003</i>			<i>0.003</i>		
ADR	-0.009	0.914		-0.010	0.912		-0.012	0.888	
	<i>0.087</i>			<i>0.089</i>			<i>0.088</i>		
AUDIT	0.000	0.954		0.001	0.910		0.001	0.829	
	<i>0.006</i>			<i>0.006</i>			<i>0.006</i>		
GDP				0.000	0.749		0.000	0.699	
				<i>0.000</i>			<i>0.000</i>		
LAW							0.005	0.653	
							<i>0.012</i>		
Const	-0.205	0.114		-0.198	0.129		-0.189	0.151	
	<i>0.130</i>			<i>0.131</i>			<i>0.131</i>		
Industry control	Yes			yes			yes		
Number of obs	3622			3622			3622		
Number of groups	529			529			529		

Number of instruments	89	90	91
	109.16	117.66	119.92
Wald Chi2 (prob)	(0.000)***	(0.000)***	(0.000)***
Mean VIF	1.24	1.25	1.26
Breusch-Pagan/Cook-Weisberg test (prob)	573.98 (0.000)***	577.48 (0.000)***	539.61 (0.000)***
Arellano-Bond test Order 1	-6.718 (0.000)***	-6.756 (0.000)***	-6.743 (0.000)***
Arellano-Bond test Order 2	0.2177 (0.8277)	0.2322 (0.816)	0.2299 (0.8181)

Source: the authors.

GMM two-step estimation results with robust standards errors.

Robust standards errors are in italics.

Model (1) includes firm-level and industry control variables.

Model (2) includes firm-level, industry and crisis control variables.

Model (3) includes firm-level, industry, crisis, country-level (rule of law) control variables.

Industry control was omitted by the GMM estimation in all regressions.

CASH is the ratio of cash and cash equivalents and total assets.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

LEV is the ratio of total debt and total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and short-term investments, divided by total assets.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

GDP is the gross domestic product growth per year of each country.

LAW is the rule of law range from -2.5 (weak) to 2.5 (strong).

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Table 1.8 shows a negative and statistically significant coefficient (1% level) of IFRS standards, demonstrating that mandatory IFRS adoption decreased corporate cash holdings in the firms analyzed. This result was verified in model 1, 2 and 3.

This result is consistent with García-Teruel et al. (2009), Sun et al. (2014) and Farinha et al. (2018), demonstrating that accounting quality (through IFRS variable) plays a role on cash management, reducing the level of asymmetry information and thus allows lower levels of cash holdings. Consequently, the set of IFRS standards leads to better accounting information quality, which should be a factor to reduce the asymmetry between firms and investors.

The results also demonstrate that some cash determinants are relevant to the Latin American context, as firm size (SIZE), cash flow generation (FLOW), liquid assets substitutes (NWC) and capital expenditures (CAPEX).

The firm size coefficient is positive, demonstrating that larger firms hold more cash, contrary to the trade-off model of economies of scale in larger firms (Bates et al., 2009; Ferreira & Vilela, 2004; Opler et al., 1999). Despite that, the evidence corroborates with the argument that larger firms tend to have more discretionary power over the investment and financial policies, increasing cash amounts, according to Free Cash Flow Theory (Ferreira & Vilela, 2004; Opler et al., 1999). Besides that, Pecking Order Theory states that larger firms should have more cash holdings since they have presumably been more successful after controlling for investment (Ferreira & Vilela, 2004; Opler et al., 1999).

The cash flow generation presented a positive coefficient, showing an increase in cash holdings (Bates et al., 2009; Ferreira & Vilela, 2004; Opler et al., 1999; Ozkan & Ozkan, 2004). This is consistent to the view of when current operational cash flows are enough to finance new investments, firms should repay debt and maintain higher cash levels, as stated by Pecking Order Theory (Ferreira & Vilela, 2004; Opler et al., 1999).

The negative coefficient of NWC variable corroborates with the argument that liquid assets can be cash substitutes (Bates et al., 2009; Ferreira & Vilela, 2004; Ozkan & Ozkan, 2004; Opler et al., 1999) since working capital and investments compete for available resources (Fazzari & Petersen, 1993). According to Trade-off Theory, cash holdings contribute to minimize costs of external funds or to liquidate existing assets, acting as a buffer between sources of financing and uses of funds (Ferreira & Vilela, 2004; Opler et al., 1999).

Capital expenditures have a negative impact on cash holdings, demonstrating that capital expenditures should increase debt capacity and reduce the demand for cash holdings since these expenses create assets that should be used as collateral (Bates et al., 2009). Further, a productivity shock could increase investments and firms could temporarily invest more and hold less cash (Riddick & Whited, 2009).

Appendix J shows the same regressions but considering the control of corruption instead of rule of law. The results corroborate with previous estimation of Table 1.8, demonstrating a negative and significant coefficient of IFRS adoption on cash holdings.

Table 1.9 shows the results of the regressions that include the joint effect of mandatory IFRS adoption and earnings management practices on cash holdings, through the interaction between IFRS and $|DA|$, as stated in H_2 .

Table 1.9 Cash holdings, Earnings management and IFRS adoption

Dependent Variable	CASH		
	Model (1)	Model (2)	Model (3)

Independent Variables									
	Coef.	P-value		Coef.	P-value		Coef.	P-value	
CASH									
Lag 1.	0.371 <i>0.059</i>	0.000	***	0.375 <i>0.059</i>	0.000	***	0.374 <i>0.059</i>	0.000	***
DA	0.135 <i>0.043</i>	0.001	***	0.136 <i>0.043</i>	0.002	***	0.141 <i>0.043</i>	0.001	***
IFRS	-0.009 <i>0.005</i>	0.063	*	-0.009 <i>0.005</i>	0.059	*	-0.009 <i>0.005</i>	0.050	**
IFRS_ DA	-0.033 <i>0.062</i>	0.592		-0.031 <i>0.062</i>	0.618		-0.032 <i>0.061</i>	0.606	
SIZE	0.007 <i>0.006</i>	0.248		0.007 <i>0.007</i>	0.285		0.006 <i>0.007</i>	0.357	
DIV	-0.004 <i>0.005</i>	0.368		-0.004 <i>0.005</i>	0.348		-0.005 <i>0.005</i>	0.318	
LEV	0.007 <i>0.026</i>	0.785		0.008 <i>0.026</i>	0.754		0.010 <i>0.026</i>	0.709	
FLOW	0.175 <i>0.029</i>	0.000	***	0.178 <i>0.029</i>	0.000	***	0.180 <i>0.029</i>	0.000	***
NWC	-0.129 <i>0.029</i>	0.000	***	-0.128 <i>0.029</i>	0.000	***	-0.128 <i>0.028</i>	0.000	***
CAPEX	-0.266 <i>0.047</i>	0.000	***	-0.266 <i>0.047</i>	0.000	***	-0.269 <i>0.048</i>	0.000	***
GOP	0.002 <i>0.003</i>	0.539		0.002 <i>0.003</i>	0.588		0.002 <i>0.003</i>	0.581	
ADR	0.000 <i>0.087</i>	0.999		-0.001 <i>0.089</i>	0.994		-0.002 <i>0.088</i>	0.985	
AUDIT	-0.002 <i>0.006</i>	0.774		-0.001 <i>0.006</i>	0.841		-0.001 <i>0.006</i>	0.914	
GDP				0.000 <i>0.000</i>	0.696		0.000 <i>0.000</i>	0.621	
LAW							0.009 <i>0.012</i>	0.438	
Const	-0.109 <i>0.133</i>	0.411		-0.099 <i>0.134</i>	0.457		-0.082 <i>0.135</i>	0.544	
Industry control		yes			yes			yes	
Number of obs		3610			3610			3610	
Number of groups		529			529			529	
Number of instruments		91			92			93	
Wald Chi2 (prob)		127.54 (0.00)***			139.04 (0.00)***			141.75 (0.00)***	
Mean VIF		1.54			1.52			1.52	
Breusch-Pagan/Cook-Weisberg test (prob)		666.11 (0.00)***			671.71 (0.00)***			640.04 (0.00)***	
Arellano-Bond test Order 1		-6.69 (0.00)***			-6.73 (0.00)***			-6.72 (0.00)***	

Arellano-Bond test	-0.01	-0.00	-0.01
Order 2	(0.99)	(0.995)	(0.991)

Source: the author.

GMM two-step estimation results with robust standards errors.

Robust standards errors are in italics.

Model (1) includes firm-level and industry control variables.

Model (2) includes firm-level, industry and crisis control variables.

Model (3) includes firm-level, industry, crisis, country-level (rule of law) control variables.

Industry control was omitted by the GMM estimation in all regressions.

|DA| is the absolute discretionary accruals obtained from the Kothari et al. (2005) model.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

IFRS_ |DA| is the interaction variable of IFRS and DA.

SIZE is the natural logarithm of total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

LEV is the ratio of total debt and total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and short-term investments, divided by total assets.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

GDP is the gross domestic product growth per year of each country.

LAW is the rule of law range from -2.5 (weak) to 2.5 (strong).

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

The results indicate a significant influence of the level of earnings management on cash holdings for all models (firm-level, country-level and macroeconomic controls). We found that |DA| has a positive and significant effect on cash holdings, with a cash variation around 13.5%. That is, firms with higher (lower) values of discretionary accruals tend to maintain higher (lower) levels of cash (García-Teruel et al., 2009).

In complement, we found that IFRS adoption reduced the level of cash holdings, corroborating with our previous results of Table 1.8. Besides that, the incremental analysis did not provide significant results, not corroborating with the additional hypothesis H₂.

Firm control variables also provide significant results according to previous estimations of Table 1.8, except the variable firm size that did not present statistically coefficients. Finally, for greater consistency in the results, we estimate the same regressions considering the inclusion of control of corruption instead of rule of law (Appendix K panel a). The results remain consistent and thus demonstrate the same sign and significance of the variables IFRS and |DA|.

1.5 Robustness Check

1.5.1 Additional regression for earnings management

To ensure the consistency of our previous estimations, we run the regressions using absolute discretionary accruals based on the model of Larcker and Richardson (2004). The model is presented in equation 1.4.

$$TA_{i,t} = \delta_0 + \delta_1(1/ASSETS_{i,t-1}) + \delta_2(\Delta SALES_{i,t} - \Delta AR_{i,t}) + \delta_3 PPE_{i,t} + \delta_4 BTM_{i,t} + \delta_5 CFO_{i,t} + u_{i,t} \quad (1.4)$$

Where,

$TA_{i,t}$ is total accruals of firm i in year t , weighted by total assets of firm i in year $t-1$;

$ASSETS_{i,t-1}$ is total assets of firm i in year $t-1$;

$\Delta SALES_{i,t}$ is net revenue for year t minus net revenue for year $t-1$ for firm i , weighted by total assets for firm i in year $t-1$;

$\Delta AR_{i,t}$ is net receivables of firm i for year t minus net receivables of firm i for year $t-1$, weighted by total assets of firm i in year $t-1$;

$PPE_{i,t}$ is net property, plant and equipment of firm i in year t ;

$BTM_{i,t}$ is the book-to-market ratio of firm i in year t ;

$CFO_{i,t}$ is operating cash flow of firm i for year t weighted by total assets of firm i in year $t-1$;

$u_{i,t}$ is the regression error term.

The results of the regression to obtain the absolute discretionary accrual $|DA2|$ from Larcker and Richardson (2004) model are reported in Appendix L.

Table 1.10 shows the results for the analysis of IFRS adoption on earnings management practices.

Table 1.10 The effect of IFRS adoption on |DA2|

Dependent Variable	DA2								
	Model (1)			Model (2)			Model (3)		
Independent Variables	Coef.	P-value		Coef.	P-value		Coef.	P-value	
DA2									
Lag 1.	0.211 <i>0.051</i>	0.000	***	0.209 <i>0.051</i>	0.000	***	0.210 <i>0.051</i>	0.000	***
IFRS	-0.008 <i>0.003</i>	0.013	***	-0.008 <i>0.003</i>	0.016	**	-0.007 <i>0.003</i>	0.037	**
SIZE	0.020 <i>0.006</i>	0.001	***	0.020 <i>0.006</i>	0.002	***	0.020 <i>0.006</i>	0.001	***
DIV	0.003 <i>0.005</i>	0.475		0.003 <i>0.005</i>	0.480		0.003 <i>0.005</i>	0.523	
LEV	0.006 <i>0.021</i>	0.775		0.006 <i>0.021</i>	0.794		0.000 <i>0.021</i>	0.993	
FLOW	0.000 <i>0.031</i>	0.988		0.000 <i>0.031</i>	0.991		0.003 <i>0.031</i>	0.930	
NWC	0.022 <i>0.031</i>	0.477		0.022 <i>0.031</i>	0.475		0.024 <i>0.032</i>	0.446	
CAPEX	-0.071 <i>0.034</i>	0.040	**	-0.070 <i>0.034</i>	0.043	**	-0.069 <i>0.034</i>	0.040	**
GOP	-0.002 <i>0.002</i>	0.440		-0.002 <i>0.002</i>	0.432		-0.002 <i>0.002</i>	0.517	
ADR	0.045 <i>0.030</i>	0.137		0.048 <i>0.030</i>	0.110		0.046 <i>0.029</i>	0.117	
AUDIT	0.014 <i>0.007</i>	0.029	**	0.014 <i>0.007</i>	0.035	**	0.014 <i>0.007</i>	0.036	**
GDP				0.000 <i>0.000</i>	0.731		0.000 <i>0.000</i>	0.525	
LAW							-0.024 <i>0.008</i>	0.003	***
const	-0.394 <i>0.124</i>	0.001	***	-0.386 <i>0.126</i>	0.002	***	-0.395 <i>0.122</i>	0.001	***
Industry control		yes			yes			yes	
Number of obs		3121			3121			3121	
Number of groups		463			463			463	
Number of instruments		89			90			91	
Wald Chi2 (prob)		51.37 (0.00)***			50.57 (0.00)***			64.47 (0.00)***	
Mean VIF		1.25			1.25			1.27	
Breusch-Pagan/Cook-Weisberg test (prob)		1373.04 (0.00)***			1376.51 (0.00)***			1385.41 (0.00)***	
Arellano-Bond test Order 1		-6.49 (0.00)***			-6.49 (0.00)***			-6.51 (0.00)***	
Arellano-Bond test Order 2		0.84 (0.40)			0.80 (0.42)			0.83 (0.41)	

Source: the author.

GMM two-step estimation results with robust standards errors.

Robust standards errors are in italics.

Model (1) includes firm-level and industry control variables.

Model (2) includes firm-level, industry and crisis control variables.

Model (3) includes firm-level, industry, crisis, country-level (rule of law) control variables.

Industry control was omitted by the GMM estimation in all regressions.

|DA2| is the absolute discretionary accruals from Larcker and Richardson (2004) model.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

LEV is the ratio of total debt and total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and short-term investments, divided by total assets.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

GDP is the gross domestic product growth per year of each country.

LAW is the rule of law range from -2.5 (weak) to 2.5 (strong).

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

The results of Table 1.10 are similar to those found in Table 1.7. The IFRS adoption variable remains significant and presents a negative coefficient, indicating that IFRS adoption has reduced the scope of earnings management practices in Latin American firms. The same occurs when we include control of corruption rather than rule of law (Appendix I panel b).

Table 1.11 Complementary regression of the effect of IFRS adoption and earnings management on cash holdings

Dependent Variable	CASH								
	Model (1)			Model (2)			Model (3)		
Independent Variables	Coef.	P-value		Coef.	P-value		Coef.	P-value	
CASH									
Lag 1.	0.376	0.000	***	0.374	0.000	***	0.375	0.000	***
	<i>0.060</i>			<i>0.061</i>			<i>0.061</i>		
DA2	0.106	0.240		0.108	0.229		0.101	0.259	
	<i>0.090</i>			<i>0.090</i>			<i>0.090</i>		
IFRS	-0.010	0.103	*	-0.009	0.107		-0.010	0.098	*
	<i>0.006</i>			<i>0.006</i>			<i>0.006</i>		
IFRS_ DA2	-0.112	0.271		-0.111	0.275		-0.103	0.313	
	<i>0.102</i>			<i>0.102</i>			<i>0.102</i>		
SIZE	0.013	0.049	**	0.012	0.066	*	0.012	0.077	*
	<i>0.006</i>			<i>0.006</i>			<i>0.007</i>		
DIV	-0.003	0.601		-0.003	0.604		-0.003	0.596	
	<i>0.005</i>			<i>0.005</i>			<i>0.005</i>		
LEV	0.027	0.279		0.028	0.268		0.030	0.233	
	<i>0.025</i>			<i>0.025</i>			<i>0.025</i>		
FLOW	0.184	0.000	***	0.187	0.000	***	0.188	0.000	***
	<i>0.031</i>			<i>0.030</i>			<i>0.031</i>		
NWC	-0.143	0.000	***	-0.143	0.000	***	-0.142	0.000	***
	<i>0.031</i>			<i>0.031</i>			<i>0.031</i>		
CAPEX	-0.256	0.000	***	-0.258	0.000	***	-0.261	0.000	***
	<i>0.050</i>			<i>0.050</i>			<i>0.051</i>		
GOP	0.001	0.879		0.000	0.934		0.001	0.887	
	<i>0.004</i>			<i>0.004</i>			<i>0.004</i>		

ADR	-0.010	0.903		-0.007	0.936	-0.009	0.916
	<i>0.085</i>			<i>0.088</i>		<i>0.087</i>	
AUDIT	0.001	0.868		0.001	0.844	0.002	0.791
	<i>0.007</i>			<i>0.007</i>		<i>0.007</i>	
GDP				0.000	0.588	0.000	0.626
				<i>0.000</i>		<i>0.000</i>	
LAW						0.003	0.818
						<i>0.013</i>	
const	-0.218	0.103	*	-0.203	0.131	-0.198	0.144
	<i>0.134</i>			<i>0.134</i>		<i>0.135</i>	
Industry control	yes			yes		yes	
Number of obs	3241			3241		3241	
Number of groups	483			483		483	
Number of instruments	91			92		93	
	140.18					144.78	
Wald Chi2 (prob)	(0.00)***			147.25 (0.00)***		(0.00)***	
Mean VIF	1.52			1.5		1.5	
Breusch-Pagan/Cook-Weisberg test (prob)	624.66			631.95 (0.00)***		574.14	
	(0.00)***					(0.00)***	
Arellano-Bond test							
Order 1	-6.16 (0.00)***			-6.16 (0.00)***		-6.15 (0.00)***	
Arellano-Bond test							
Order 2	0.51 (0.61)			0.50 (0.62)		0.50 (0.62)	

Source: the author.

GMM two-step estimation results with robust standards errors.

Robust standards errors are in italics.

Model (1) includes firm-level and industry control variables.

Model (2) includes firm-level, industry and crisis control variables.

Model (3) includes firm-level, industry, crisis, country-level (rule of law) control variables.

Industry control was omitted by the GMM estimation in all regressions.

|DA2| is the absolute discretionary accruals from Larcker and Richardson (2004) model.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

IFRS_|DA2| is the interaction variable of IFRS and DA2.

SIZE is the natural logarithm of total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

LEV is the ratio of total debt and total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and short-term investments, divided by total assets.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

GDP is the gross domestic product growth per year of each country.

LAW is the rule of law range from -2.5 (weak) to 2.5 (strong).

In general, the results of Table 1.11 are similar to those found in Table 1.9, corroborating with previous results that demonstrates a reduction on cash levels post-IFRS adoption. We also

estimate the cash model considering the inclusion of control of corruption instead of rule of law (Appendix K panel b).

1.5.2 Subsample analysis of ADR and non-ADR issuers

Considering that firms that issued ADR are expected to have superior quality even before the mandatory adoption of IFRS standards and studies suggest that ADR can play a role in minimizing earnings management practices (Black & Nakao, 2017; Lang et al., 2012), we ran additional regression by subsample analysis considering ADR and non-ADR firms. The results are presented in Table 1.12.

Table 1.12 Subsample analysis of ADR issuers

Dependent Variable	CASH						
	Non-ADR firms				ADR firms		
	Coef.	Robust Std. Err.	P-value		Coef.	Robust Std. Err.	P-value
Independent Variables							
CASH							
Lag 1.	0.374	0.061	0.000 ***		0.357	0.211	0.091 *
IFRS	-0.013	0.004	0.005 ***		-0.028	0.016	0.082 *
SIZE	0.012	0.007	0.086 *		-0.005	0.024	0.824
DIV	-0.001	0.004	0.763		-0.009	0.015	0.562
LEV	0.009	0.028	0.751		0.000	0.102	0.999
FLOW	0.187	0.029	0.000 ***		0.027	0.145	0.853
NWC	-0.128	0.028	0.000 ***		-0.116	0.096	0.224
CAPEX	-0.267	0.051	0.000 ***		-0.262	0.184	0.153
GOP	0.001	0.003	0.750		0.016	0.014	0.254
AUDIT	0.000	0.006	0.962		0.018	0.024	0.455
GDP	0.000	0.000	0.787		0.000	0.001	0.810
LAW	-0.008	0.013	0.551		0.082	0.044	0.063 *
const	-0.187	0.137	0.172		0.182	0.564	0.747
Industry control		yes				yes	
Number of obs		3280				342	
Number of groups		492				42	
Number of instruments		90				90	
Wald Chi2 (prob)		112.55 (0.00)***				84.5 (0.00)***	

Source: the author.

GMM two-step estimation results with robust standards error.

Industry control was omitted by the GMM estimation in all regressions.

CASH is the ratio of cash and cash equivalents and total assets.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

LEV is the ratio of total debt and total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and short-term investments, divided by total assets.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

GDP is the gross domestic product growth per year of each country.

LAW is the rule of law range from -2.5 (weak) to 2.5 (strong).

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

The results show that for both group of firms, the IFRS adoption reduced cash holdings due to an increase of the accounting information quality. However, when we compare the significance of the coefficients, the findings suggest that the benefits from IFRS adoption are more pronounced in non-ADR firms (higher significance level for this group).

The findings suggest that ADR has already demonstrated lower levels of earnings management (Lang et al., 2012) since ADR firms tend to have strong incentives to improve the level of accounting information quality, and thus the effects of IFRS standards are less pronounced in such firms.

1.6 Concluding Remarks

This study analyzed the effect of the mandatory adoption of IFRS standards on cash holdings in Latin American firms from 2005 to 2018. We also analyzed the incremental effect of earnings management practices post-IFRS adoption on cash holdings in these firms.

We first verified the effect of IFRS adoption on accounting quality of firms in Latin America. The results show that the adoption of IFRS standards reduces the scope of earnings management practices in these firms. This finding contributes to the debate of the benefits of IFRS adoption in low investor protection countries (Houqe et al., 2014; García et al., 2017; Manzano & Conesa, 2014; Montoya, 2018; Pelucio-Grecco et al., 2014).

Furthermore, the results show that IFRS adoption has decreased cash holdings in Latin American firms. That is, companies with higher quality maintain lower cash levels, emerging economic consequences by demonstrating that better quality of financial reports could play a role to reduce the effects of asymmetric information between firms and investors (García-Teruel et al., 2009).

Finally, our findings also demonstrate that the benefits of IFRS adoption is more pronounced in non-ADR firms once the presence of ADR has already represented strong incentives to improve the level of accounting information quality.

We highlight some limitations from the study: (i) discretionary accruals metrics are subjected to estimations' problems since they are not unique. We chose Kothari et al. (2005) model since it is more widespread in the literature nowadays and provide additional tests by Larcker and Richardson (2004) model; (ii) as the sample selection is non-probabilistic, the

results cannot be generalized to other contexts and periods; (iii) accounting quality can be measured by a set of attributes. Considering that only one measure may not be capable to capture all the possible benefits of IFRS adoption, we chose one more general; (iv) IFRS variable only comprises pre- and post- mandatory adoption, not considering the possibility of early adoption in some firms.

Therefore, future studies could analyze corporate cash holdings in the context of IFRS adoption, including other perspectives as governance mechanisms and ownership concentration, credit rated firms and other measures of accounting quality in Latin America and in others settings of firms.

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2. CASH HOLDINGS AND COST OF CAPITAL IN LATIN AMERICA: DO IFRS STANDARDS MATTER?

Abstract

We analyzed the effects of IFRS adoption in the relationship between cash holdings and cost of capital in Latin American firms. We applied GMM two step regressions in a sample composed by 735 public firms in Latin America, in a total of 8,986 firm-year observations from 2005 to 2018. Our main findings demonstrated that IFRS adoption impacts the relationship between cash holdings and cost of equity in Latin American firms. Besides the benefits of IFRS adoption can be perceived in an overall sample of firms, when we compare the groups of internationalized and non-internationalized firms, these benefits can be perceived only for the group of non-internationalized firms. That is, internationalized firms already present higher levels of information quality due its greater complexity of information processing and international diversification. Additional analysis suggests that IFRS adoption could be sufficient to reduce costs of raising funds in Latin American firms. That is, lower levels of information asymmetric tend to provide incentives for managers to hold less cash amount. Regarding the cost of debt, the results show that IFRS adoption does not influence debt markets since creditors have their own mechanisms for loans guarantee and privileged access to firm's financial information. Our study seeks to contribute to cash management literature by demonstrating that the relationship between cash holdings and cost of capital are sensitive to the context of IFRS adoption in Latin America.

Keywords: Cash holdings. IFRS. Cost of capital. Latin America. Internationalization.

2.1 Introduction

In perfect capital markets, Modigliani and Miller (1958) demonstrated that the capital structure tends to not affect the firm's cost of capital, so that the financing and investment decisions might be independent. Transaction costs would be nil and markets perfectly liquid (Copeland, Weston & Shastri, 1998). Consequently, cash decisions would be irrelevant to firm value, characterizing cash holdings as negative debt, not changing the fact if a firm holds an extra dollar of cash financed with an extra dollar of debt (Opler, Pinkowitz, Stulz & Williamson, 1999).

However, perfect capital markets become implausible, due to several imperfections in the markets, such as informational asymmetry (Stein, 2003). Scott (2009, p. 117) characterizes the difference between an efficient and an inefficient market through the existence of privileged information, that is, in an inefficient market, insiders can take advantage from the private information, which is characteristic of adverse selection.

According to Gârleanu and Pedersen (2004), adverse selection tends to distort the choice of investors and make capital allocations inefficient and costly, leading to an increase in the cost of capital. This is because investors realize that a large part of the financial information provided by a firm is not useful, that is, they are not able to inform the true status of that firm (Scott, 2009, p. 117).

In the environment of informational asymmetry, the process of raising external resources by firms is more expensive, as investors do not have the same level of information as the manager (Myers & Majluf, 1984). Consequently, firms can maintain considerable levels of cash resources to reduce external dependence (Dittmar, Mahrt-Smith & Servaes, 2003; Farinha, Mateus & Soares, 2018; García-Teruel & Martínez-Solano, 2008; García-Teruel, Martínez-Solano & Sánchez-Ballesta, 2009; Sun, Yung & Rahman, 2014).

Accounting has a fundamental role in providing relevant information to users, controlling adverse selection and reducing the incompleteness of financial markets (Scott, 2009, p. 116). In this way, the adoption of IFRS has a relevant role in mitigating the effects of information asymmetry, being considered one of the most significant changes in the history of Accounting (Daske, Hail, Leuz & Verdi, 2008).

However, the adoption of the International Financial Reporting Standards (IFRS) varies depending on the history, culture, and legal system of the adopting countries (Nobes, 2011). Gao (2010) adds that a higher quality of disclosure may not necessarily be associated with a reduction in the cost of capital. Previous studies have demonstrated an indirect effect of a reduction in the cost of capital in firms around the world (Daske et al., 2008; Karamanou & Nishiotis, 2009; Lee, Walker, & Christensen, 2010; Li, 2010; Saha & Bose, 2021). This situation can also be verified in lower developed countries (Gasparini, 2015; Lima, 2011; Lima, Lima & Gotti 2018; Moscariello, Skerratt, & Pizzo 2014; Silva & Nardi, 2014), although the evidence in this kind of context is still scarce (Pelucio-Grecco, Geron, Grecco, & Lima, 2014).

The purpose of this study is to analyze the effects of IFRS adoption in the relationship between cash holdings and the cost of capital in Latin American firms. For this purpose, we analyzed a sample composed by 735 public firms in Latin America, in a total of 8,986 firm-year observations from 2005 to 2018.

Our findings demonstrated that the IFRS adoption impacts the relationship between cash holdings and the cost of equity in Latin American firms since the cost of equity became significant post-IFRS adoption. Regarding the cost of debt, the results demonstrated that IFRS adoption tend to not provide influence on debt markets since creditors have their own mechanisms for loans guarantee and privileged access to financial information of firms.

Our results also demonstrated that the benefit from IFRS adoption can be perceived only for the group of non-internationalized firms. These results are consistent with the view that internationalized firms already present higher level of quality in its financial reports since they have greater complexity of information processing and international diversification.

In addition, our findings show that cost of equity is sensitive to the context of IFRS adoption in non-internationalized firms. In this sense, non-internationalized firms already face challenges in relation to cost of capital, and it is more pronounced post the adoption of IFRS standards.

Finally, the results suggest that IFRS adoption tend to be sufficient to reduce costs of raising funds in Latin American firms. That is, lower levels of information asymmetric and, consequently lower external funding costs, tend to provide incentives for managers to hold less cash amounts.

Therefore, the study aims to contribute to the cash management literature, demonstrating that the cost of equity is sensitive to the context of IFRS adoption, and this relationship varies in relation to the degree of internationalization in Latin American firms. These findings contribute to financial reporting and, consequently, allocation of resources in the capital market. Our study also provides evidence of the effect of IFRS adoption on cash management decisions considering the context of Latin America.

2.2 Theoretical Background and Hypothesis Development

2.2.1 Cash Holdings and Cost of Capital

The existence of market imperfections might justify the reasons that firms maintain certain amounts of cash holdings. Gao, Harford and Li (2013) argue that one of the most relevant financial decisions is related to the amounts allocated in cash holdings. Keynes (1936) points out three reasons to explain cash holdings decisions. The first is related to fluctuations in inflows and outflows of resources in the short-term period. The second is related to the firm's

future cash needs so that the cash is kept as a buffer, for precautionary reasons, as a manner to mitigate a lack of cash and losses of future investment opportunities. Finally, the speculative reason in which companies retain resources to speculate future returns.

Ferreira and Vilela (2004) found that the level of development of the capital markets has a negative impact on cash holdings. The lower level of market development tends to limit the access of external financing due to the high transaction costs involved in raising additional funds. Consequently, firms tend to accumulate larger amounts in cash for precautionary reasons (Ferreira & Vilela, 2004).

Three theoretical models complement each other in determining the factors that impact cash holdings' decisions: Static Tradeoff Theory, Pecking Order Theory and Free Cash Flow Theory (Ferreira & Vilela, 2004).

According to the tradeoff model, there is an optimum level of cash holdings, which is obtained by weighing the marginal costs and the benefits of maintaining cash resources (Ferreira & Vilela, 2004). The main benefits are related to the minimization of the cost of raising funds, continuity of investment and security policies when there are financial disturbances. The opportunity cost could be the highest cash retention cost (Opler et al., 1999). In addition to these factors, Koshio and Cia (2004) identified the existence of an arbitrage benefit, which companies maintain high cash levels to take advantage of interest rate differences between foreign and domestic markets.

The alternative view of the tradeoff model considers there is a lack of an optimal cash level since there are costs associated with raising outside funds. Firms that have already accessed public markets could raise outside funds more easily whether they have credit lines available outstanding (Opler et al., 1999).

García-Teruel and Martínez-Solano (2008) found that firms subject to a greater propensity for problems of asymmetry information have higher costs of being "distant" from the optimal cash level, consequently, these firms are subjected to present larger amounts of cash holdings.

Through the Pecking Order Theory, firms choose to finance their investments primarily by retained earnings. Then, they can turn to debt markets and, finally, issue equity (Myers & Majluf, 1984). The firms tend to prefer debt over equity since adverse selection costs make equity more expensive (Opler et al., 1999). This theory states that, although there is no optimal cash level, cash holdings can be used as a buffer between retained earnings and investment opportunities (Ferreira & Vilela, 2004).

The Free Cash Flow Theory proposes that managers can accumulate cash holdings in order to increase the capacity of assets under their control and use them for their own benefit, harming the interests of shareholders (Jensen, 1986).

From the perspective of Agency Theory, the decision of the sources of financing in companies could lead to conflicts between managers, shareholders and creditors. Raising debts implies that managers would have lower level of funds available to spend in their own benefits, consequently, debt financing could be applied to monitor the behavior of managers (Jensen, 1986).

2.2.2 The role of IFRS standards in the cost of capital

The investor decisions are influenced by disclosed information since investors are willing to sell their shares after receiving information that changes their expectations (Gao, 2010). The quality of accounting information affects the various contractual terms, which could lead to higher costs of capital in case of lower levels of information quality (Francis, La Fond, Olsson & Schipper 2005).

The IFRS are a set of accounting standards issued by the International Accounting Standards Board (IASB) with the purpose of being a set of accounting rules that could be applied equally to financial reporting by all firms around the world (Ball, 2006). As well enhancing the comparability, reliability, and transparency of disclosed information (Ball, Li & Shivakumar, 2015). Consequently, the lower levels of information asymmetry could contribute to better decisions by users in the allocation of scarce resources (Ball et al., 2015).

Daske et al. (2008) investigated the economic consequences of mandatory IFRS adoption in 26 countries. The authors found that, on average, market liquidity increased, and the cost of capital decreased. Despite that, the benefits were more pronounced in countries with greater transparency and higher levels of enforcement law.

Lee et al. (2010) analyzed companies from 17 European countries from 1995 to 2006, demonstrating that the cost of equity tends to be lower post IFRS adoption, especially in countries with higher incentives to transparency. Similarly, Li (2010) found a reduction of cost of equity by 47 basis points in countries of European Union.

In Brazil, Lima (2011) investigated 148 companies listed on the BM&FBOVESPA. The results showed that incentives such as size, exposure to the international scenario, external financing, growth opportunities, performance, ownership structure and presence of auditors are

determinant in the behavior of companies in relation to IFRS standards. Furthermore, the findings suggest weak evidence of a reduction in the cost of equity and an increase in market liquidity in Brazilian companies.

Other studies such as Silva and Nardi (2014) and Gasparini (2015) also found evidence for Brazilian companies. Silva and Nardi (2014) analyzed 93 companies belonging to the IBrX-100 during the mandatory IFRS adoption. The findings demonstrated an increase in the quality of accounting information and a small reduction in the cost of equity by seven basis points in that period. Gasparini (2015) analyzed 160 public companies in Brazil, from 2004 to 2013, and found a small reduction in the implicit cost of equity in three basis points.

Despite that, Gatsios et al. (2016) found that the adoption of IFRS standards does not contribute to reduce the equity cost in Brazilian firms in the period of 2004 to 2013. The results suggest that the process of IFRS adoption might take more time to impact the cost since it also depends on the use by firms.

Considering that creditors have different information needs than equity investors, the effects of IFRS adoption may not be necessarily generalized to debt markets (Florou & Kosi, 2015). IFRS adoption could be viewed by creditors as affording higher levels of discretionary power by managers since its standards are perceived to be more principles-based than rules-based, consequently, they could lead more discretion power to managers (Ball et al., 2015).

Moscariello et al. (2014) analyzed a sample of U.K. and Italian public firms from 2002 to 2008 and found evidence of no effect on the U.K. debt cost, consistent with the fact that U.K. domestic standards are closer to IFRS standards. On the other hand, the findings suggest that more weight was placed on the accounting numbers in Italian firms post-IFRS, demonstrating that the benefits from IFRS adoption to creditors tend to occur even in a weak enforcement regime.

Ball et al. (2015) investigated the effect of IFRS adoption on debt contracting in a sample of debt issues between 2001 and 2010 in 22 IFRS adopters' countries and 21 non-IFRS adopters' countries. They found a significant decline in frequency and intensity of accounting-based covenants use. Greater declines were observed in countries whose domestic standards are more differed from IFRS and for financial firms, but not in countries with higher scores of enforcement law.

Florou and Kosi (2015) analyzed an international sample of government bonds and private loans from 2000 to 2007. They found that the likelihood of a firm accesses the bond market tends to be higher for mandatory adopters and the cost of bonds decreased 36.6 basis points per annum post IFRS. In contrast, the authors did not find a significant relationship

between loan rates and IFRS adoption. The authors point out these results suggest positive externalities for debt financing in the context of IFRS adoption, but only for bond markets, where the reliance on public financial reporting is more pronounced.

Persakis and Iatridis (2017) verified the effects of IFRS adoption on earnings quality, investor protection and cost of capital (both equity and debt) in public firms in Euro zone and Asian countries from 2000 to 2014. The findings showed that the cost of capital is lower post IFRS adoption. Considering the joint effects of investor protection, earnings quality and IFRS adoption on cost of capital, the results demonstrated that the cost of capital tends to be lower for firms with strong investor protection and higher earnings quality after the IFRS adoption.

Based on a sample of 6,500 credit ratings and 137,000 loan contracts from Brazilian credit market, Lima et al. (2018) found that a dispersion in credit ratings assigned by creditors was reduced for firms with improved accounting information after the period of transition to IFRS standards. Their results also demonstrated that IFRS mandatory adoption may be positive or negative consequences for firms on the credit market, depending on the presence of incentives. In this sense, the results showed that firms with incentives to improve earnings quality display lower levels of cost of debt, longer maturity, greater loans and less demand for collaterals after the transition period. The authors highlighted although Brazil is considered an emerging economy, firm-level incentives could compensate the lack of a strong institutional framework, corroborating to the emergence of economic benefits of IFRS adoption.

Saha and Bose (2021) examined the relationship between IFRS disclosure and the cost of capital for a sample of Australian firms. They found that firms with a higher level of IFRS disclosure have lower cost of capital. Further analysis shows that IFRS disclosure requirements are negatively related to the cost of debt and equity.

2.2.3 Hypothesis Development

The informational asymmetry between firms and investors can lead them to discount the price and increase the cost of raising funds since they tend to associate that firm with lower levels of accounting quality reports (Myers & Majluf, 1984).

Lee et al. (2010) suggest that the benefits of IFRS adoption could lead to lower levels of information asymmetry and reduce the cost for analysis and decision-making process, reflecting in the reduction of the cost of capital.

García-Teruel et al. (2009), Sun et al. (2014) and Farinha et al. (2018) emphasize that a higher level of information asymmetry and/or less application of the law tends to provide

incentives for managers to hold larger amounts of cash, while remaining afraid of the higher external funding costs.

Some authors found evidence that IFRS adoption could provide benefits even in emerging economies (Lima et al., 2018; Moscariello et al., 2014). The authors point out that firm-level incentives could compensate the lack of a strong institutional framework, corroborating to the emergence of economic benefits of IFRS adoption (Lima et al., 2018).

Saha and Bose (2021) found evidence that IFRS requirements are negatively related to the cost of capital in Australian firms, contributing to the debate on the relative costs and benefits of IFRS disclosure requirements of financial statements.

Our proposal is to analyze the effects of IFRS adoption in the relationship between cash holdings and the cost of capital in Latin American firms. Therefore, we have proposed the following hypothesis:

H1: The mandatory adoption of IFRS influenced the relationship between cash holdings and cost of capital in Latin American firms.

The impact of the cost of capital on cash amounts after the adoption of IFRS is analyzed for the cost of equity (K_e), cost of debt (K_i) and weighted average cost of capital (WACC).

In addition to the general hypothesis H1, we proposed an additional hypothesis, H2, to verify the additional contribution of the cost of capital (in this case, cost of equity) in cash amounts post-IFRS adoption, considering the degree of internationalization in Latin American firms. Singh and Nejadmalayeri (2004) found previous evidence that a higher degree of international diversification results in lower levels of cost of capital.

H2: The relationship between cash holdings and cost of capital is moderated by the degree of internationalization in Latin American firms post-IFRS adoption.

Previous evidence has demonstrated differences in cash holdings of firms with a higher degree of internationalization when compared to domestic firms. Doukas and Pantzalis (2003) argue that internationalized firms have better access to the capital market than domestic firms.

In a study with North American firms, Chiang and Wang (2011) demonstrated that the level of internationalization is a determinant of cash holdings. The authors found that cash holdings increase as the international expansion increases, but to a certain extent, called

“turning point”, because, after that, the cash resources start to fall with the increase of internationalization.

Arata, Sheng and Lora (2015) suggests a different behavior for Brazilian and Chilean firms during the period from 2006 to 2010, demonstrating that the cash level increases quadratically as internationalization increases. The authors state that it may be due the fact that the funds raised are invested in bonds in the countries of origin, causing a yield differential. In addition, the authors found that, in the period before the financial crisis, companies held smaller amounts of cash, since access to credit was more abundant.

Finally, Fernandes and Gonenc (2016) analyzed the influence of internationalization on the cash holdings of firms in 40 countries for the period from 1990 to 2011. The authors found evidence that geographical and industrial diversification negatively affect cash decisions, mainly due to economies of scale in multinational firms. Since they are diversified in different markets, they tend to reduce, on average, their cash amounts. Furthermore, country-level tests demonstrate that institutional differences related to tax systems, investor protection, political stability, capital market development, economic growth and cultural aspects have effects on these types of diversification firms.

Therefore, we aim to capture different features of non-internationalized and internationalized firms regarding its influence on cash holdings and cost of capital in the context of IFRS adoption.

2.3 Research Design

2.3.1 Sample and data description

The initial sample comprises 1,255 public firms from Argentina, Brazil, Chile, Colombia, Mexico, and Peru from 2005 to 2018.

Financial industry and insurance firms were excluded from the initial sample since they present operational and cash management differences (Bates, Kahle & Stulz, 2009). We also excluded observations of firms with negative equity, null available information and less than three firm-year observations during the sample period.

The final sample comprises an unbalanced panel data of 735 public firms, in a total of 8,986 firm-year observations from 2005 to 2018. Table 2.1 shows the final sample composition.

Table 2.1 Final sample composition

Description	Firms	Observations
Total public firms	1,255	17,150
(-) financial and insurance firms	(423)	(5,922)
(=) initial sample	832	11,228
(-) firm-year observations with null information in all period		
(-) firm-year observations with negative equity	(97)	(2,242)
(-) firm-year observations with less than three per firm		
(=) final sample	735	8,986

Source: the authors.

Final sample comprises 735 non-financial public firms from Latin America.

Final sample contains Argentina, Brazil, Chile, Colombia, Mexico and Peru.

Unbalanced panel data contains 8,986 firm-year observations from 2005 to 2018.

All financial information was collected in USD dollars.

Table 2.2 shows the segregation of final sample according to the classification of country (Panel A) and industry (Panel B).

Table 2.2 Sample classification

(a) Panel A: sample description by country		
Country	Number of obs.	Freq. %
Argentina	961	10.69%
Brazil	2,813	31.30%
Chile	1,960	21.81%
Colombia	537	5.98%
Mexico	1,336	14.87%
Peru	1,379	15.35%
Total	8,986	100%

(b) Panel B: sample description by industry		
Industry	Number of obs.	Freq. %
Industrials	1,436	15.98%
Basic materials	1,709	19.02%
Consumer non-cyclical	1,839	20.47%
Utilities	1,383	15.39%
Energy	275	3.06%
Consumer cyclical	1,817	20.22%
Healthcare	203	2.26%
Technology	137	1.52%
Telecommunications	187	2.08%
Total	8,986	100%

Source: the authors.

Final sample comprises 8,986 firm-year observations from 2005 to 2018.

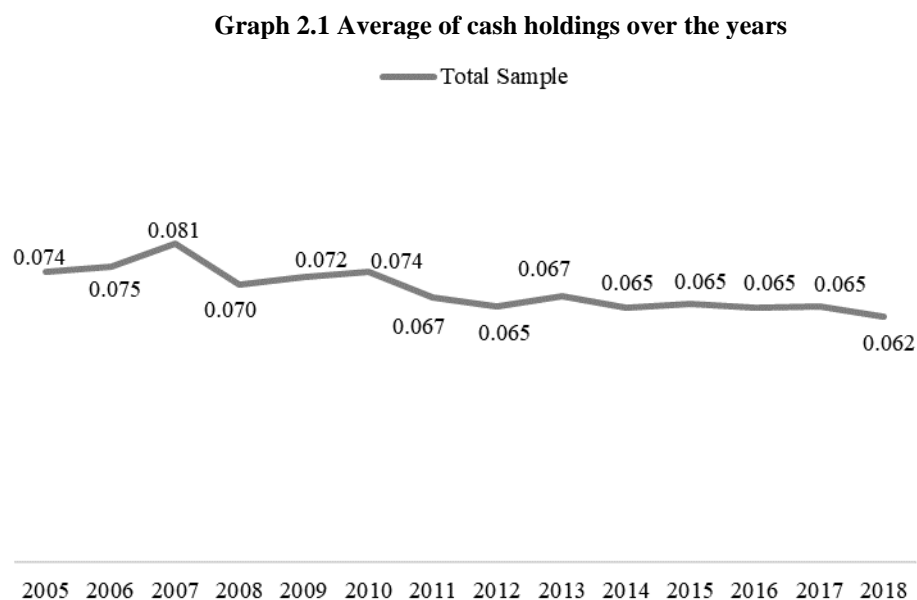
Industry classification of TRBC Economic Sector Name.

The most representative countries of the final sample are Brazil (31.3%) and Chile (21.8%). Colombian firms present the lowest number of firm-year observations (5.98%). The most representative industries are Basic Materials (19%), Consumer cyclical (20.2%) and Consumer non-cyclical (20.47%). The technology industry presents the lowest number of firm-year observations, around 2% of final sample.

2.3.2 Variables and regression specification

The dependent variable is the corporate cash holdings (CASH), which is defined as the ratio of cash and cash equivalents² divided by the total assets (Bates et al., 2009; García-Teruel et al., 2009; Ozkan & Ozkan, 2004).

Graph 2.1 shows the behavior of the mean values of cash and cash equivalents to total assets over the sample. The graph shows that the values are slightly stable over the years. However, we can observe a decline in these values, especially after 2010. When we compare the initial value (2008) and last one (2018), we can observe a negative variation around 16%. We highlighted average values of cash holdings only give us a general overview since they could be influenced by expressive variations in the dataset.



Source: the authors.

Total sample includes Brazil, Argentina, Chile, Colombia, Mexico, and Peru.

²If the firm did not present information of cash and cash equivalents, we consider cash and short-term investments for these years.

The interest variable is the mandatory IFRS adoption in each country as described in Table 2.3. We consider IFRS as a dummy variable that takes the value one (1) for the years post-IFRS adoption and zero (0) for prior years. Considering that a restricted group of firms had been prepared for the voluntary adoption, the present research considered only the pre and post period of IFRS mandatory adoption (IFRS, 2020). The mandatory adoption is still a recent phenomenon in Latin America, as Colombian firms in 2015.

Table 2.3 IFRS mandatory adoption per country and year

Country	Stock Exchange	Year
Argentina	<i>Bolsa de Comercio de Buenos Aires</i>	2012
Brazil	<i>B3 - Brasil, Bolsa, Balcão</i>	2010
Chile	<i>Bolsa de Santiago</i>	2009
Colombia	<i>Bolsa de Valores de Colombia</i>	2015
Mexico	<i>Bolsa Mexicana de Valores</i>	2012
Peru	<i>Bolsa de Valores de Lima</i>	2012

Source: IFRS (2020b).

Under the cost of capital perspective, we consider the cost of equity (K_e), cost of debt (K_i) and weighted average cost of capital (WACC).

The cost of equity (K_e) is obtained by the Capital Asset Pricing Model (CAPM) proposed by Sharpe (1964) and Lintner (1965). Considering that the sample comprises less developed countries, we applied the adapted model, as proposed in the studies of Damodaran (2002), Damodaran (2007), Assaf Neto (2004) and Assaf Neto, Lima and Araújo (2008). The following steps were performed to calculate the cost of equity (K_e):

- Identification of unlevered betas of US companies by industry per year;
- Allocation of unlevered beta to each firm according to the pairing of industry and year;
- Calculation of debt index (the ratio of total debt and total equity) for each firm per year;
- Identification of corporate tax rate of each country per year;
- Calculation of levered betas for each firm per year;
- Identification of US average risk-free rate (T-bond 10-year maturity) per year;
- Identification of S&P 500 index per year;
- Identification of CPI inflation rate of each country per year;

- Identification of J.P. Morgan Emerging Market Bond Index (EMBI rate) of each country per year;
- Calculation of the cost of equity for each firm per year.

Equation 2.1 shows the calculation of the levered beta:

$$\beta_L = \beta_U \left[1 + (1 - Tc) * \left(\frac{D}{E} \right) \right] \quad (2.1)$$

Where,

β_L is the levered beta from US firms by industry per year available at Damodaran online database;

β_U is the unlevered beta of each firm of the sample per year;

Tc is the corporate tax rate per country and year (Appendix K);

D/E is the ratio of total debt and total equity of each firm of the sample per year.

Equation 2.2 shows the calculation of the cost of equity (Ke):

$$Ke = Rf_{US} + \beta_L(Rm_{US} - Rf_{US}) - CPI_{US} + CPI_{LA} + EMBI \quad (2.2)$$

Where,

Ke is the cost of equity of each firm of the sample per year;

Rf_{US} is the US average risk-free rate per year (US treasury 10-year Bond);

β_L is the levered beta of each firm of the sample per year;

Rm_{US} is the S&P 500 index per year available at Damodaran online database;

CPI_{US} is the CPI-US index per year;

CPI_{LA} is the CPI index of each country of the sample per year;

$EMBI$ is the J.P. Morgan Emerging Market Bond Index (EMBI rate) of each country per year.

The cost of debt (Ki) is obtained net of the effect of tax rates (Gitman, 2010), according to Equation 2.3.

$$Ki = \frac{\text{Financial interests}}{\text{Debt}} * (1 - Tc) \quad (2.3)$$

Where,

Ki is the cost of debt of each firm per year;

Financial interests are financial expenses of each firm per year;

Debt is the average total debt of each firm per year;

Tc is the corporate tax rate per country and year (Appendix K).

In addition to the cost of equity and cost of debt, we calculate the weighted average cost of capital (WACC). The weighted average cost of capital is obtained as a result of each component of cost of capital and weights based on its contribution to the total capital amount (Gitman, 2010; Ross, Westerfield & Jordan, 1997).

In relative terms, WACC is the rate used to discount the value of money over time through the conversion of future cash flows into its present value for the shareholders (Copeland, Koller & Murrin, 2000, p. 220). Equation 2.4 shows the calculation of WACC:

$$WACC = \left[\frac{E}{(E + D)} * Ke \right] + \left[\frac{D}{(E + D)} * Ki \right] \quad (2.4)$$

Where,

WACC is the weighted average cost of capital of each firm per year;

E is total equity of each firm per year;

D is total debt of each firm per year;

$(E + D)$ is total capital (total debt plus total equity) of each firm per year;

Tc is the corporate tax rate per country and year (Appendix K).

Ke is the cost of equity of each firm per year;

Ki is the cost of debt of each firm per year.

The following variables describe the controls of firm, which traditionally affect the cash holdings, country-level and the macroeconomic control of Gross Domestic Product (GDP).

Firm size (SIZE) is measured by the natural logarithm of total assets (Chang & Noorbash, 2009; Foley, Hartzell, Titman & Twite, 2007). Larger firms are expected to hold less cash since these firms tend to be more diversified (Rajan & Zingales, 1995; Titman & Wessels, 1988) and present higher levels of economies of scale (Bates et al., 2009; Opler et al., 1999) when compared to its counterparts.

We include the cash flow from operating activities over total assets (FLOW). Firms with higher cash flows are expected to present higher cash levels since they accumulate more cash (Bates et al., 2009; Ferreira & Vilela, 2004; Opler et al., 1999; Ozkan & Ozkan, 2004).

We control for liquid assets substitutes, which are measured by the net working capital of the firm (NWC). The existence of other net assets can substitute cash holdings (Bates et al., 2009; Ferreira & Vilela, 2004; Opler et al., 1999; Ozkan & Ozkan, 2004) since they compete for available resources (Fazzari & Petersen, 1993).

Firms with greater growth opportunities (GOP) can maintain higher cash levels to carry out investment projects (Kim, Mauer & Sherman, 1998; Opler et al., 1999; Ozkan & Ozkan, 2004). In addition, firms with greater growth opportunities are subject to have greater costs of financial distress (Bates et al., 2009).

Capital expenditures (CAPEX). Firms with higher levels of capital expenditures tend to present more liquid assets (Opler et al., 1999). Besides, whether capital expenditures create assets that can be used as collateral, capital expenditures tend to increase the debt capacity and reduce the demand for cash (Bates et al., 2009).

Dividend-paying firms (DIV) should maintain less cash balances (Opler et al., 1999) since they tend to present less risky and greater access to the capital market (Bates et al., 2009; Ferreira & Vilela, 2004).

Shorter debt maturity firms (MDEBT) will keep higher cash holdings in order to mitigate the possibility of financial distress (Ferreira & Vilela, 2004; Guney, Ozkan & Ozkan, 2003). Short-term debt is related to higher levels of asymmetric information (Guedes & Opler, 1996). Consequently, it is expected a negative relationship between debt maturity and cash holdings.

We include the control of profitability (PROFIT). Firms with higher results retain higher level of liquidity so profitable companies should have more cash (Ferreira & Vilela, 2004; Opler et al., 1999).

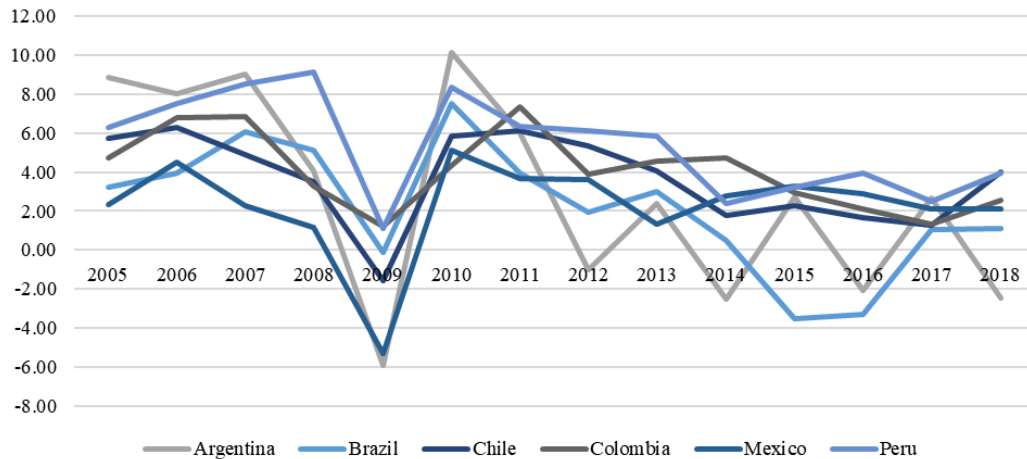
We also control for audit firm size (AUDIT). Firms that are audited by a big four auditorship would tend to disclosure higher levels of financial reporting (Francis & Wang, 2008).

We include a dummy variable to control when a firm has issued American Depositary Receipts (ADR) in the United States of America. That is, the ADR variable takes the value of one (1) for the years from the date of issuance and zero (0) for the previous year or if the company does not have issued ADR. Considering that ADR issuers must comply with the requirements of U.S. Securities and Exchange Commission (SEC), these firms tend to present better accounting information (Lang, Lins & Maffett, 2012).

The rule of law (LAW) variable measures the perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of the contract enforcement, property rights, the policy, and the courts, as well as the likelihood of crime and violence (Kaufmann, Kraay & Mastruzzi, 2010, p. 4). The range of -2.5(weak) to 2.5 (strong) indicates the level of enforcement in the country and it is consistent with previous studies as Simnett, Vanstraelen and Chua (2009) and Alrazi, Villiers and Van Staden (2016). The scores of each country were obtained in the World Bank database (Appendix D).

The macroeconomic control considers the GDP growth rate (Appendix C). This rate reveals positive and negative variations in the GDP growth rate over the years (The World Bank Group, 2020). Graph 2.2 shows the GDP growth rate by country per year:

Graph 2.2 GDP Growth rates



Source: The World Bank Group (2020).

According to Graph 2.2, negative variations are expressive in periods of global crises, as 2008-2009 and 2015-2016. That is, the effects of economic crisis can be demonstrated by negative changes in GDP rate (Filip & Raffounier, 2014; Frankel & Saravelos, 2012; Iatridis & Dimitras, 2013).

To test our research hypotheses, we propose the equation 2.5:

$$\begin{aligned}
 CASH_{i,t} = & \beta_0 + \beta_1 K_{i,t} + \beta_2 IFRS_{i,t} + \beta_3 IFRS_{i,t} \times K_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 FLOW_{i,t} \\
 & + \beta_6 NWC_{i,t} + \beta_7 DIV_{i,t} + \beta_8 CAPEX_{i,t} + \beta_9 GOP_{i,t} + \beta_{10} MDEBT_{i,t} \\
 & + \beta_{11} PROFIT_{i,t} + \beta_{12} ADR_{i,t} + \beta_{13} LAW_{i,t} + \beta_{14} GDP_{i,t} + u_{i,t}
 \end{aligned} \quad (2.5)$$

Where,

$CASH_{i,t}$ is corporate cash holdings of firm i in year t ;

$K_{i,t}$ is the cost of capital of firm i in year t ;

$IFRS_{i,t}$ equals to 1 (one) from the year of mandatory IFRS adoption and, 0 (zero) otherwise;

$IFRS_{i,t} \times K_{i,t}$ is the interaction variable between IFRS and K of firm i in the year t ;

$SIZE_{i,t}$ is the natural logarithm of total assets of firm i in year t ;

$FLOW_{i,t}$ is the ratio of cash from operating activities and total assets of firm i in year t ;

$NWC_{i,t}$ current net assets minus cash and cash and equivalents, divided by total assets of firm i in year t ;

$DIV_{i,t}$ is the dividend dummy that takes 1 if the firm i has cash-dividend payment in year t and 0, otherwise;

$CAPEX_{i,t}$ is the ratio of capital expenditures and total assets of firm i in year t ;

$GOP_{i,t}$ is the ratio of company market value and book value of firm i in year t ;

$MDEBT_{i,t}$ is the ratio of long-term debt and total debt of firm i in year t ;

$PROFIT_{i,t}$ is the return on assets of firm i in year t ;

$ADR_{i,t}$ is the dummy variable that takes 1 if the firm i is ADR listing at NYSE stock exchange in year t and 0, otherwise;

$LAW_{i,t}$ is the rule of law score that ranges from -2.5 (weak) to 2.5 (strong) for the country of firm i in year t ;

$GDP_{i,t}$ is the gross domestic product growth for the country of firm i in year t ;

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}, \beta_{12}, \beta_{13}, \beta_{14}$, are the estimated coefficients in the regression;
 $u_{i,t}$ is the regression error term.

Our interest variable is the interaction between IFRS adoption and the cost of capital (β_3), considering the estimations for the cost of equity, cost of debt and weighted average cost of capital. We expect that the relationship between cash holdings and cost of capital could be influenced by IFRS standards in Latin America.

Regarding the second hypothesis, we performed the model previous stated in equation 2.5 but considering the regressions 'estimations for the groups of internationalized and non-internationalized firms.

The list of all variables, including its description and database source, is available on Appendix M.

The use of conventional methods of estimating data, as fixed and random effects may not be adequate since unobserved variables can have some variation in time, not being captured by the fixed effect. Besides, some of the regressors could be correlated with past and current values of idiosyncratic error component (Dahrouge & Saito, 2013; Guney et al, 2003; Ozkan & Ozkan, 2004).

Consequently, we applied Generalized Method of Moments (GMM) dynamic panel data estimations to control for endogeneity by using instruments based on lags of the original regressors. We consider control variables related to firm, industry, macroeconomic and country-level characteristics. We obtained the GMM estimator in two steps to ensure homoscedasticity in the residuals (Arellano & Bond, 1991).

2.4 Results Discussion

Table 2.4 shows the descriptive statistics of the final sample from 2005 to 2018, considering non-financial public firms from Argentina, Brazil, Chile, Colombia, Mexico and Peru.

Table 2.4 Descriptive statistics

Variable	Number of obs.	Mean	Median	Std. Dev.	Min	Max
CASH	8,948	0.069	0.035	0.092	0.000	0.508
Ke	8,986	0.231	0.216	0.083	0.115	0.612
Ki	8,242	0.088	0.036	0.319	0.000	2.834
WACC	7,455	0.160	0.154	0.052	0.066	0.368
IFRS	8,986	0.614	1.000	-	-	-
SIZE	8,979	19.807	19.931	2.105	13.42	24.169
FLOW	8,979	0.070	0.065	0.094	-0.218	0.402
NWC	8,979	0.058	0.033	0.171	-0.407	0.585
DIV	5,965	0.913	1.000	-	-	-
CAPEX	8,979	0.051	0.037	0.053	0.000	0.285
GOP	8,979	1.207	0.996	0.927	0.048	6.226
MDEBT	8,053	0.606	0.702	0.320	0.000	1.000
PROFIT	8,754	0.045	0.041	0.090	-0.288	0.399
ADR	8,941	0.063	1.000	-	-	-
AUDIT	5,374	1.000	1.000	-	-	-
LAW	8,986	-0.027	-0.315	0.721	-0.886	1.433
GDP	8,986	3.088	3.202	3.132	-5.919	10.125

Source: the authors.

The final sample was winsorized at 0.1 percentile and 99.9 percentile, except variables from The World Bank database and dummies.

CASH is the ratio of cash and cash equivalents and total assets.

Ke is the cost of equity.

Ki is the cost of debt.

WACC is the weighted average cost of capital.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law ranges from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

The average amount of cash is 6.9% to total assets during the period, which is similar to found in the study of García-Teruel et al. (2009) for a sample of Spanish firms. The average amount is below to that found in U.S., France, U.K., and Japan in the study of Guney et al. (2003). The highest amount of cash to total assets reached 50.8%.

The average value of Ke reached 23.1%, KI 8.8% and WACC 16% during the period. The highest value of weighted average cost of capital (WACC) reached 36.8%. The average debt maturity reached 60.6% in the period, demonstrating that sample firms present an average of 60% of long-term debt. The profitability is an average of 4.5% in the period, with a maximum

value of 39.9%. The firms presented positive growth rates in the period as the mean value of GOP was 1.207.

The Shapiro-Wilk test to verify the normality of the sample variables is presented on Appendix N. The results demonstrated that only the dummy variable IFRS presented normal distribution.

We also verified the multicollinearity of the variables, the interaction variable of Ke and IFRS (Ke_IFRS) and WACC and IFRS (WACC_IFRS) presented $VIF > 10$. The test (not reported) presented VIF values of 20.33 and 18.72, respectively.

According to Burrill (2002) and Balli and Sorensen (2013), an interaction of the variables tends to correlate with the simple variables that define them and with other explanatory variables (called predictors). The authors attribute this multicollinearity to the spurious correlation since, although the interaction is logically the independence of simple variables to which it is related, the more complex models are, they tend to present more multicollinearity, hampering the detection of the effects of the interactions and contaminating the dataset (Balli & Sorensen, 2013; Burrill, 2002).

To solve this multicollinearity, Draper and Smith (1981), Burrill (2002) and Balli and Sorensen (2013) suggest that the method of product's orthogonalization might be applied in terms of linear effects from which they were obtained. The orthogonalization consists of regressing the interacted variable (called product) with the corresponding original variables. The obtained residue then represents the interacted variable, so that it has a mean and zero correlation with the other variables, describing the "pure" effect of the original interaction (Burrill, 2002).

Therefore, we applied the cross-section regression with robust standard errors, considering the interaction variable as dependent and its corresponding original variables as independent. The results are presented in Appendix O.

The results of GMM regressions to verify our primary research hypothesis are presented below. Table 2.5 presents the results of the impact of IFRS adoption, cost of equity (Ke) and its interactions on cash holdings (CASH).

Table 2.5 GMM regression of cash holdings, cost of equity and IFRS adoption

Dependent Variable		CASH		
Independent Variables	Coef.	Robust Std. Err.	P-value	
CASH				
Lag 1.	0,330	0,066	0,000	***
Ke	-0,023	0,044	0,593	
IFRS	-0,007	0,004	0,055	*
Ke_IFRS	0,044	0,019	0,020	**
SIZE	0,007	0,005	0,148	
FLOW	0,124	0,031	0,000	***
NWC	-0,304	0,035	0,000	***
DIV	0,007	0,005	0,224	
CAPEX	-0,220	0,048	0,000	***
GOP	0,008	0,004	0,055	*
MDEBT	0,055	0,011	0,000	***
PROFIT	0,071	0,032	0,027	**
ADR	0,087	0,080	0,276	
LAW	0,016	0,013	0,217	
GDP	0,000	0,000	0,618	
Const	-0,153	0,110	0,163	
Industry control		Yes		
Number of obs		2869		
Number of groups		442		
Number of instruments		93		
Prob-Chi2		203.91 (0.000)***		
Arellano-Bond test				
Order (1)		-5.8969 (0.000)***		
Order (2)		0.6107 (0.5414)		

Source: the authors.

GMM two-step regression with robust standard errors.

AUDIT was dropped from the model because of collinearity.

Industry control dropped because of collinearity.

CASH is the ratio of cash and cash equivalents and total assets.

Ke is the cost of equity.

Ke_IFRS is the residual of the interaction variable of Ke and IFRS.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash and equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law ranges from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Table 2.5 shows a negative and significant coefficient (at 10% of significance level) of IFRS adoption on cash holdings. This evidence suggests that the IFRS adoption might be

sufficient to reduce costs of raising funds in Latin American firms. Therefore, lower levels of information asymmetric tend to provide incentives for managers to hold less cash levels, because of lower levels of external funding costs (Farinha et al., 2018; García-Teruel et al., 2009; Sun et al., 2014).

Besides that, the regression also demonstrated a significant coefficient of the interaction between cost of equity and IFRS adoption (Ke_IFRS). We can infer that IFRS adoption might impact the relationship between cash holdings and the cost of equity in Latin American firms since the cost of equity became significant post-IFRS adoption.

In other words, when the firms increase cost of equity post-IFRS, they also increase cash levels. Consequently, the cost of capital seems to cost more after IFRS adoption and cash holdings became sensitive to the adoption of these standards. Before the IFRS adoption, the cost of equity did not present direct impact on cash levels, which differs in the post-adoption period.

Therefore, whether the cost of equity increases, cash levels also tend to increase since the interaction coefficient is higher than only IFRS, demonstrating an economically significance of the results.

Table 2.6 presents the results of the impact of IFRS adoption, cost of debt (Ki) and its interactions on cash holdings (CASH).

Table 2.6 GMM regression of cash holdings, cost of debt and IFRS adoption

Dependent Variable	CASH			
Independent Variables	Coef.	Robust Std. Err.	P-value	
CASH				
Lag 1.	0,327	0,064	0,000	***
Ki	0,017	0,019	0,380	
IFRS	-0,006	0,004	0,107	
Ki_IFRS	-0,010	0,013	0,465	
SIZE	0,008	0,005	0,125	
FLOW	0,125	0,031	0,000	***
NWC	-0,301	0,034	0,000	***
DIV	0,006	0,006	0,270	
CAPEX	-0,212	0,049	0,000	***
GOP	0,007	0,004	0,072	*
MDEBT	0,054	0,011	0,000	***
PROFIT	0,074	0,032	0,023	**
ADR	0,088	0,081	0,279	
LAW	0,012	0,012	0,311	
GDP	0,000	0,000	0,430	
Const	-0,164	0,105	0,118	
Industry control		Yes		
Number of obs		2869		
Number of groups		442		

Number of instruments	93
Prob-Chi2	203.35 (0.000)***
Arellano-Bond test	
Order (1)	-5.899 (0.000)***
Order (2)	0.58618 (0.5578)

Source: the authors.

GMM two-step regression with robust standard errors.

AUDIT was dropped from the model because of collinearity.

Industry control dropped because of collinearity.

CASH is the ratio of cash and cash equivalents and total assets.

Ki is the cost of debt.

Ki_IFRS is the interaction variable of KI and IFRS.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash and equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law ranges from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Table 2.6 did not present significant results in our interest variables. The evidence suggests that IFRS adoption tend to not provide influence on cash holdings nor with the interaction with IFRS and cost of debt. Florou and Kosi (2015) argue that creditors and equity investors have different information requirements, as consequence the effects of IFRS adoption may not be necessarily generalized to the debt market. It might be linked to the fact of creditors have their own mechanisms for contractual incentives, as restrictive clauses, covenants, warranties and applying adjustments to the financial statements to seek their self-interests in granting loans.

In addition, IFRS adoption cannot be perceived as a direct benefit to the debt market since creditors have privileged access through more direct channels with the firms, that might reduce agency costs faced by borrowers with low quality in its financial statements (Bharath, Sunder & Sunder, 2008).

Table 2.7 presents the results of the impact of IFRS adoption, weighted average cost of capital (WACC) and the interaction variable (WACC_IFRS) on the dependent variable of cash holdings (CASH).

Table 2.7 GMM regression of cash holdings, WACC and IFRS adoption

Dependent Variable		CASH		
Independent Variables	Coef.	Robust Std. Err.	P-value	
CASH				
Lag 1.	0,282	0,075	0,000	***
WACC	0,022	0,069	0,749	
IFRS	-0,005	0,005	0,222	
WACC_IFRS	-0,035	0,041	0,395	
SIZE	0,000	0,009	0,978	
FLOW	0,143	0,032	0,000	***
NWC	-0,215	0,037	0,000	***
DIV	0,001	0,005	0,855	
CAPEX	-0,190	0,055	0,000	***
GOP	0,007	0,004	0,107	
MDEBT	0,048	0,011	0,000	***
PROFIT	0,097	0,039	0,013	**
ADR	0,009	0,006	0,100	*
LAW	0,015	0,014	0,279	
GDP	0,000	0,000	0,499	
Const	-0,003	0,187	0,987	
Industry control		Yes		
Number of obs		1918		
Number of groups		383		
Number of instruments		93		
Prob-Chi2		117.77 (0.000)***		
Arellano-Bond test				
Order (1)		-3.6736 (0.000)***		
Order (2)		1.2197 (0.2226)		

Source: the authors.

GMM two-step regression with robust standard errors.

AUDIT was dropped from the model because of collinearity.

Industry control dropped because of collinearity.

CASH is the ratio of cash and cash equivalents and total assets.

WACC is the average cost of capital.

WACC_IFRS is the residual of the interaction variable of WACC and IFRS.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash and equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law ranges from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Table 2.7 shows the GMM results considering the weighted average cost of capital, which considers the weighting between debt and equity. The findings did not provide significant

results to our interest variables. Despite the fact of the results are significant for cost of equity, when we analyze the weighted average cost of capital, we did not find significant coefficients since the effects could be diluted by the weighing of the sources of capital.

Aiming to analyze our second hypothesis, we first provide a descriptive statistic from internationalized and non-internationalized firms, in addition to the non-parametrical test of Mann-Whitney to verify whether there are differences between these two groups of firms, considering the comparison of cash holdings (CASH) and cost of equity (Ke).

To verify the differences between these groups of firms, we consider the DOI variable, that is a dummy variable that takes the value of one in case of DOI different from zero. In other words, whether a firm presented foreign revenues in a respective year different from zero, we attributed the value of one in the DOI dummy variable. On the other hand, whether a firm presented foreign revenues equals to zero in a respective year, we attributed the value of zero in that year.

Table 2.8 Mann-Whitney test for internationalized and non-internationalized firms

Mann-Whitney test		Dummy DOI	
		0	1
CASH	Mean	0.072	0.074
	Median	0.041	0.049
	Std. Dev.	0.090	0.082
	Number of obs.	1985	2095
	Freq. of obs.	48,65%	51,35%
	Z (prob-Z)	-2.521 (0.0117)***	
Ke	Mean	0.248	0.246
	Median	0.237	0.229
	Std. Dev.	0.079	0.088
	Number of obs	1985	2095
	Freq. of obs	48,65%	51,35%
	Z (prob-Z)	2.769 (0.0056)***	

Source: the authors.

CASH is the ratio of cash and cash equivalents and total assets.

Ke is the cost of equity.

DOI is the ratio of foreign revenues and total revenues.

DOI_DUMMY takes the value of 1 for firms that presented DOI different of zero, and 0 otherwise.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

The results from the Mann-Whitney test on Table 2.8 demonstrated that the difference between groups is significant at 1% level of significance. That is, we observed that the degree of internationalization provides differences in cash and cost of equity levels between firms.

According to Table 2.8, the most part of the sample are internationalized firms (51%) and non-internationalized firms correspond to 49%. The descriptive statistic shows that the mean and median values of cash holdings are higher in internationalized firms than its counterparts. This is consistent with the findings of Arata et al. (2015), whose results demonstrated that the degree of internationalization is a determinant of cash holdings, and that cash amounts increases quadratically as the degree of firm internationalization grows.

In relation to the cost of equity, the higher values are from non-internationalized firms. That is, internationalized firms present lower levels of cost of capital. Singh and Nejadmalayeri (2004) found that higher degree of international diversification results in lower overall cost of capital (combined debt and equity).

Table 2.9 shows the GMM regression's results of cash holdings, cost of equity and IFRS adoption and its interaction, considering the groups of non-internationalized (Panel A) and internationalized firms (Panel B).

Table 2.9 GMM regression of cash holdings, cost of equity and IFRS adoption for DOI subsamples
(a) Panel A: Subsample of non-internationalized firms (DOI = 0)

Dependent Variable		CASH		
Independent Variables	Coef.	Robust Std. Err.	P-value	
CASH				
Lag 1.	0,272	0,066	0,000	***
IFRS	-0,011	0,007	0,080	*
Ke	-0,073	0,069	0,290	
Ke_IFRS	0,065	0,030	0,029	**
SIZE	0,015	0,008	0,063	*
FLOW	0,070	0,050	0,164	
NWC	-0,259	0,043	0,000	***
DIV	0,010	0,010	0,299	
CAPEX	-0,132	0,081	0,105	
GOP	0,018	0,006	0,004	***
MDEBT	0,050	0,018	0,007	***
PROFIT	-0,058	0,053	0,276	
ADR	0,054	0,017	0,002	***
LAW	0,011	0,022	0,606	
GDP	-0,001	0,001	0,119	
Const	-0,293	0,171	0,086	*
Industry control		Yes		
Number of obs.		898		
Number of groups		203		
Number of instruments		93		
Prob-Chi2		114.94 (0.000)***		

(b) Panel B: Subsample of internationalized firms (DOI = 1)

Dependent Variable		CASH		
Independent Variables	Coef.	Robust Std. Err.	P-value	
CASH				
Lag 1.	0,239	0,066	0,000	***
IFRS	-0,003	0,007	0,722	
Ke	-0,043	0,051	0,392	
Ke_IFRS	0,035	0,024	0,151	
SIZE	-0,012	0,010	0,230	
FLOW	0,112	0,044	0,011	***
NWC	-0,392	0,060	0,000	***
DIV	0,003	0,008	0,684	
CAPEX	-0,270	0,081	0,001	***
GOP	0,011	0,007	0,134	
MDEBT	0,053	0,021	0,011	***
PROFIT	0,154	0,044	0,000	***
ADR	0,382	0,014	0,000	***
LAW	0,064	0,020	0,001	***
GDP	0,000	0,001	0,850	
Const	0,221	0,216	0,308	
Industry control		yes		
Number of obs		947		
Number of groups		182		
Number of instruments		93		
Prob-Chi2		1526.39 (0.000)***		

(c) Panel C: Arellano-Bond test for the regression

Order	Z	Prob> z
Order 1	-2,942	0.0033***
Order 2	1,525	0,127

H0: no autocorrelation

Source: the authors.

GMM two-step regression with robust standard errors.

AUDIT dropped because of collinearity.

Industry control dropped because of collinearity.

DOI is the ratio of foreign revenues and total revenues.

DOI_DUMMY takes the value of 1 for firms that presented DOI different of zero, and 0 otherwise.

CASH is the ratio of cash and cash equivalents and total assets.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

Ke is the cost of equity.

Ke_IFRS is the residual of the interaction variable of KE and IFRS.

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash and equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law ranges from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Table 2.9 shows that, when we compare the groups of non-internationalized and internationalized firms, the benefits of IFRS adoption can be different. That is, the benefits of IFRS adoption can be perceived only for the group of non-internationalized firms. Panel B suggests that there is no impact of IFRS adoption on cash holdings of internationalized firms.

The negative and significant coefficient of IFRS adoption (10%) on cash holdings for non-internationalized firms (Panel A) demonstrates that IFRS adoption reduced cash holdings in these firms. As stated before, we did not find significance of IFRS adoption variable for the group of internationalized firms (Panel B). These results are consistent with the view that internationalized firms already present higher level of quality in its financial reports. International diversification creates greater informational need and creates greater incentives for firms to provide high quality information (Rusanescu, 2014).

The diversified firms with operations abroad have greater incentives to provide extensive financial information to its foreign clients, suppliers and potential investors (Isidro & Raonic, 2012). Besides that, the international capital competition generated incentives for improving the information quality and the accounting comparability (Land & Lang, 2002). In addition, institutional and foreign investors prefer high quality financial information when making international investments (Bradshaw, Bushee, & Miller, 2004).

Therefore, our results suggest the benefits from IFRS adoption might be perceived in non-internationalized firms since internationalized firms have greater incentives to provide higher quality of information since the complexity of information processing are higher with the international diversification (Rusanescu, 2014).

In addition to the statistical significance of IFRS adoption variable, Table 2.9 also shows that the interaction between IFRS adoption and cost of equity (Ke_IFRS) provided a positive coefficient at 5% of significance level on cash holdings for non-internationalized firms (Panel A). We did not find influence of Ke_IFRS for the group of internationalized firms (Panel B).

The findings suggest that the cost of equity is sensitive to the context of IFRS adoption in non-internationalized firms. Singh and Nejadmalayeri (2004) argue that internationalized firms already present lower levels of cost of capital. In this sense, non-internationalized firms already face challenges in relation to the cost of capital, and it is more pronounced post the adoption of IFRS standards.

2.5 Additional Results

2.5.1 Regressions of IFRS adoption and cost of capital

The following tables provide additional results considering the influence of IFRS adoption on the cost of capital. For this purpose, we verified the impact of IFRS on Ke, Ki and WACC, respectively. In this sense, we seek to capture additional aspects of the relationship between IFRS adoption and different features of cost of capital in firms from Latin America, expanding the studies in this context.

Table 2.10 GMM regression of cost of equity and IFRS adoption

Dependent Variable	Cost of equity (Ke)		
Independent Variables	Coef.	Robust Std. Err.	P-value
Ke			
Lag 1.	0,215	0,063	0,001 ***
IFRS	-0,008	0,004	0,029 **
SIZE	-0,001	0,005	0,817
FLOW	-0,010	0,024	0,672
NWC	-0,025	0,023	0,281
DIV	-0,004	0,004	0,297
CAPEX	0,004	0,030	0,890
GOP	-0,002	0,002	0,404
MDEBT	-0,001	0,005	0,789
PROFIT	-0,044	0,028	0,113
ADR	0,000	0,091	1,000
LAW	0,109	0,010	0,000 ***
GDP	-0,004	0,000	0,000 ***
Const	0,206	0,108	0,055 *
Industry control		yes	
Number of obs		2872	
Number of groups		443	
Number of instruments		91	
Prob-Chi2		370.35 (0.000)***	
Arellano-Bond test			
Order (1)		-5.9767 (0.000)***	
Order (2)		-2.3279 (0.0199)***	

Source: the authors.

GMM two-step regression with robust standard errors.

AUDIT dropped because of collinearity.

Industry control dropped because of collinearity.

Ke is the cost of equity.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash and equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law ranges from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Table 2.10 shows a negative relationship between IFRS adoption and the cost of equity. That is, the adoption of IFRS standards provided a decrease in the cost of equity in the sample analyzed. Although some evidence demonstrated the benefits from IFRS standards could be perceived in countries with higher levels of enforcement (Daske et al., 2008; Lee et al., 2010), our results provide evidence that a reduction in cost of equity could be perceived in Latin America, after controlling the firm-level and country-level incentives. Lima et al. (2018) points out that firm-level incentives could compensate the lack of strong institutional framework in this kind of countries (emerging ones), corroborating to emerge benefits from IFRS adoption. Besides Silva and Nardi (2014) found evidence of a reduction in cost of equity in Brazilian firms, Gatsios (2016) did not corroborate with previous evidence.

Our study complements both, providing a larger sample firms, including other countries from Latin America, beyond Brazil and, we include a large period of analysis post-IFRS adoption since there is a learning curve of IFRS adoption in countries, as stated by Markov and Tamayo (2006), demonstrating that the effect of adopting IFRS standards might depend on learning period for firms and users of financial reports.

Despite the fact that the Arellano-Bond test provided significant coefficient to second order autocorrelation, we estimated the model with additional lags to verify the consistence of our previous results. The additional test is provided in Appendix Q. The second-order autocorrelation has been overcome with the estimation with additional lags and the results remains the same, but with a decrease of the significance level of IFRS variable (10%).

The following table (Table 2.11) shows the regression results for IFRS and cost of debt.

Table 2.11 GMM regression of cost of debt and IFRS adoption

Dependent Variable	Cost of debt (Ki)		
Independent Variables	Coef.	Robust Std. Err.	P-value
Ki			
Lag 1.	0,488	0,121	0,000 ***
IFRS	-0,026	0,020	0,194
SIZE	-0,009	0,011	0,408
FLOW	0,083	0,050	0,093 *
NWC	-0,004	0,044	0,937

DIV	-0,017	0,009	0,061	*
CAPEX	-0,278	0,197	0,158	
GOP	0,020	0,012	0,090	*
MDEBT	0,008	0,038	0,823	
PROFIT	0,049	0,045	0,278	
ADR	-0,012	0,019	0,518	
LAW	0,046	0,040	0,256	
GDP	0,000	0,001	0,828	
Const	0,222	0,244	0,362	
Industry control		yes		
Number of obs		2844		
Number of groups		438		
Number of instruments		91		
Prob-Chi2		49.69 (0.000)***		
Arellano-Bond test				
Order (1)		-1.6075 (0.108)		
Order (2)		1.1288 (0.259)		

Source: the authors.

GMM two-step regression with robust standard errors.

AUDIT dropped because of collinearity.

Industry control dropped because of collinearity.

Ki is the cost of debt.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash and equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law ranges from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

The results from Table 2.11 suggest that IFRS adoption tend to not provide influence on the cost of debt in the sample analyzed. Florou and Kosi (2015) argue that creditors and equity investors have different information needs, as consequence the effects of IFRS adoption may not be necessarily generalized to debtholders. When we compare the evidence from debt environment, the benefits from IFRS adoption are mixed, as can be seen by Moscariello et al. (2014), Ball et al. (2015), Florou and Kosi (2015), Persakis and Iatridis (2017) and Lima et al. (2018).

One of the possible explanations might be linked to the fact of creditors have their own mechanisms for contractual incentives, by applying adjustments to the financial statements to seek their self-interests in granting loans. In this sense, the IFRS adoption would not be perceived as a direct benefit to the debt market.

Bharath et al. (2008) shed light on the relationship between banks and borrowers, arguing that banks have superior processing mechanisms for information in order to have access to private information that is used to designate the terms of the contracts and monitor the ex-post loan terms in order to reduce moral hazard costs. Therefore, the privileged access through more direct channels with the firms might reduce agency costs faced by borrowers with low quality in their financial statements.

Table 2.12 shows the results of the regression of weighted average cost of capital and IFRS adoption variable.

Table 2.12 GMM regression of weighted average cost of capital and IFRS adoption

Dependent Variable		Weighted average cost of capital (WACC)		
Independent Variables	Coef.	Robust Std. Err.	P-value	
WACC				
Lag 1.	0,213	0,062	0,001	***
IFRS	-0,006	0,003	0,037	**
SIZE	-0,004	0,003	0,214	
FLOW	0,024	0,013	0,066	*
NWC	0,037	0,014	0,011	***
DIV	-0,004	0,003	0,202	
CAPEX	-0,045	0,019	0,016	**
GOP	-0,001	0,002	0,715	
MDEBT	-0,011	0,006	0,057	*
PROFIT	0,019	0,013	0,167	
ADR	0,021	0,046	0,646	
LAW	0,081	0,006	0,000	***
GDP	-0,003	0,000	0,000	***
Const	0,200	0,070	0,004	***
Industry control		yes		
Number of obs		2565		
Number of groups		393		
Number of instruments		91		
Prob-Chi2		259.60 (0.000)***		
Arellano-Bond test				
Order (1)		-6.875 (0.000)***		
Order (2)		-1.2013 (0.2296)		

Source: the authors.

GMM two-step regression with robust standard errors.

AUDIT dropped because of collinearity.

Industry control dropped because of collinearity.

WACC is the weighted average cost of capital.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash and equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law ranges from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Considering that weighted average cost of capital (WACC) is composed by the weighting between two sources of capital (cost of equity and cost of debt), the results converged with the previous results considering Ke variable. Thus, there is also a negative relationship between IFRS adoption and average cost of capital. That is, IFRS adoption might reduce the average cost of capital in the firms analyzed.

2.5.2 Regression of degree of internationalization, cash holdings and IFRS adoption

In this section, we provide additional regression of the effect of IFRS adoption in cash holdings, by the analysis of degree of internationalization (DOI). That is, we segregate the firms in two groups: non-internationalized firms (Panel A) and internationalized firms (Panel B).

Table 2.13 GMM regression of cash and IFRS adoption for DOI subsamples

(a) Panel A: Subsample of non-internationalized firms (DOI = 0)

Dependent Variable		CASH		
Independent Variables	Coef.	Robust Std. Err.	P-value	
CASH				
Lag 1.	0,261	0,066	0,000	***
IFRS	-0,013	0,006	0,047	**
SIZE	0,014	0,008	0,079	*
FLOW	0,070	0,052	0,175	
NWC	-0,266	0,043	0,000	***
DIV	0,008	0,010	0,414	
CAPEX	-0,113	0,078	0,151	
GOP	0,019	0,006	0,002	***
MDEBT	0,056	0,018	0,002	***
PROFIT	-0,064	0,051	0,214	
ADR	0,067	0,019	0,000	***
LAW	0,001	0,018	0,967	
GDP	0,000	0,001	0,380	
Const	-0,297	0,163	0,069	*
Industry control		yes		
Number of obs		898		
Number of groups		203		
Number of instruments		91		
Prob-Chi2		118.22 (0.000)***		

(b) Panel B: Subsample of internationalized firms (DOI = 1)

Dependent Variable		CASH		
Independent Variables	Coef.	Robust Std. Err.	P-value	
CASH				
Lag 1.	0,240	0,063	0,000	***
IFRS	-0,003	0,007	0,656	
SIZE	-0,012	0,010	0,207	
FLOW	0,111	0,044	0,011	***
NWC	-0,397	0,059	0,000	***
DIV	0,003	0,008	0,663	
CAPEX	-0,271	0,080	0,001	***
GOP	0,011	0,008	0,149	
MDEBT	0,053	0,020	0,009	***
PROFIT	0,160	0,044	0,000	***
ADR	0,379	0,014	0,000	***
LAW	0,060	0,018	0,001	***
GDP	0,000	0,001	0,752	
Const	0,218	0,213	0,307	
Industry control		Yes		
Number of obs		947		
Number of groups		182		
Number of instruments		91		
Prob-Chi2		1292.02 (0.000)***		

(c) Panel C: Arellano-Bond test for the regression

Order	Z	Prob> z
Order 1	-2,893	0,004 ***
Order 2	1,501	0,133

H0: no autocorrelation

Source: the authors.

GMM two-step regression with robust standard errors.

AUDIT dropped because of collinearity.

Industry control dropped because of collinearity.

CASH is the ratio of cash and cash equivalents and total assets.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

DOI is the ratio of foreign revenues and total revenues.

DOI_DUMMY takes the value of 1 for firms that presented DOI different of zero, and 0 otherwise.

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash and equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law ranges from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Table 2.13 shows a negative and significant coefficient of IFRS adoption (5%) on cash holdings for non-internationalized firms. We did not find evidence of IFRS adoption for the group of internationalized firms. These results are consistent with the view that internationalized firms already present higher level of quality in its financial reports.

According to Isidro and Raonic (2012), firms that have diversified operations abroad have greater incentives to provide extensive financial information to their foreign clients, suppliers and potential investors.

Consequently, our results suggest the benefits from IFRS adoption might be perceived in non-internationalized firms since internationalized firms have greater incentives to provide higher quality of information. In this sense, the international expansion of business creates greater informational need and incentives for firms to provide high quality information since the complexity of information processing are higher with the international diversification (Rusanescu, 2014).

2.6 Concluding Remarks

We analyzed the effects of IFRS adoption in the relationship between cash holdings and cost of capital in Latin American firms. For this purpose, we analyzed a sample composed by 735 public firms in Latin America, in a total of 8,986 firm-year observations from 2005 to 2018.

Our findings demonstrated that IFRS standards impacts the relationship between cash holdings and cost of equity in Latin American firms since cost of equity became significant post-IFRS adoption. That is, when the firms increase cost of equity post-IFRS, they also increase cash levels. Consequently, the cost of capital seems to cost more after IFRS adoption and cash holdings became sensitive to the adoption of these standards.

When we verified cost of debt, we did not find significant results. It might be the fact that creditors have their own mechanisms for guarantying loans and better access to privileged information of firms.

Additional analysis demonstrated that the benefits of IFRS adoption can be perceived in an overall sample of firms, but when we compare the groups, the results are different. That is, the benefit from IFRS adoption can be perceived only for the group of non-internationalized firms. These results are consistent with the view that internationalized firms already present higher level of quality in its financial reports since they have greater complexity of information processing and international diversification.

Furthermore, our results also show that the cost of equity is sensitive to the context of IFRS adoption in non-internationalized firms. In this sense, non-internationalized firms already face challenges in relation to the cost of capital, and it is more pronounced post the adoption of IFRS standards.

Our study is subject to some limitations. There are some models to calculate the cost of capital. We chose the most widespread in the related literature. In addition, as the sample selection is non-probabilistic, our findings cannot be generalized to other contexts and periods. The degree of internationalization only considered a restricted number of firms with available information at Thomson Reuters (Refinitiv) database and it was measured by a dummy variable. Finally, IFRS adoption variable considers only the pre- and post-mandatory adoption, not considering the possibility of early adoption in some firms (in which tend not to be a relevant portion of the sample).

Therefore, future studies could consider other perspectives of cost of capital to measure the impact of IFRS adoption on cash holdings, also considering different features of internationalization in Latin American firms and in other contexts.

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3. DISCRETIONARY ACCRUALS MEASURED BY GROSS INCOME AND CASH HOLDINGS IN LATIN AMERICA: AN ANALYSIS OF VALUE RELEVANCE IN THE CONTEXT OF IFRS ADOPTION

Abstract

The aim of this study is to analyze whether discretionary accruals measured by gross income are value relevant in the context of IFRS adoption in Latin America, comparing to discretionary accruals measured by net income. In addition, we verified whether discretionary accruals measured by gross income have complementary information to cash holdings, impacting value relevance considering the periods of pre- and post-IFRS adoption. For this purpose, we analyzed 811 non-financial public firms from Latin America, in a total of 8,135 firm-year observations from 2005 to 2019. We applied Generalized Method of Moments (GMM) two step regressions and found a positive and significant relationship between discretionary accruals measured by gross income and value relevance post-IFRS adoption. We did not find significant results when we consider discretionary accruals measured by net income. Additional findings demonstrate that discretionary accruals measured by gross income have complementary information to cash holdings, impacting value relevance before IFRS adoption. When we analyzed the context after the adoption of the standards, the results were not significant. That is, since the adoption of IFRS standards increase accounting quality, the information of gross income became more reliable, being a better way to predict future performance of firms than cash holdings. Our study seeks to contribute to cash management literature by demonstrating that discretionary accruals measured by gross income have complementary information to cash holdings and this relationship is influenced by the adoption of IFRS standards. In addition, the findings suggest relevant insights to earnings management literature by the analysis of discretionary accruals measured by gross income.

Keywords: cash holdings, gross income, value relevance, IFRS, Latin America.

3.1 Introduction

Earnings are a summary of performance produced by the firm under the accrual's basis of accounting (Dechow, 1994), being an aggregate of operating cash flows and accruals (Hribar & Collins, 2002).

Core, Guay & Verdi (2008) demonstrated that accruals quality seems not to be itself a priced risk factor. On the other hand, evidence suggest that gross profits can be a powerful predictor of returns and can be considered as a factor to investors when selecting their portfolios (Novy-Marx, 2013).

Ball, Gerakos, Linnainmaa and Nikolaev (2016) show that cash-based operating profitability outperforms measures of profitability that include accruals. In addition, cash-based operating profitability subsumes accruals in predicting the cross section of average returns. Their findings suggest that cash-based profitability provides stronger signal of future returns.

Since previous evidence suggest that gross profits could play a role in predicting returns, the measurement of accruals by gross income can become more relevant instead of considering net income, as it is traditionally applied in the literature of earnings management.

The aim of this study is to analyze whether discretionary accruals measured by gross income are value relevant in the context of International Financial Reporting Standards (IFRS) adoption, comparing to discretionary accruals measured by net income. In addition, we analyze whether discretionary accruals measured by gross income have complementary information to cash holdings, impacting value relevance.

For this purpose, we analyzed 811 public firms from Latin America, in a total of 8,135 firm-year observations from 2005 to 2019. Through Generalized Method of Moments (GMM) two step regressions, we found that discretionary accruals measured by gross income influence value relevance, different from discretionary accruals measured by net income, in which we did not find significant results.

These results are significant only post-IFRS adoption, suggesting that in the context of higher levels of accounting quality, this kind of information became more relevant. García, Alejandro, Sáenz and Sánchez (2017) previous revealed the importance that the market accords to the implementation of international standardized standards, increasing value relevance.

Additional findings demonstrate that discretionary accruals measured by gross income have complementary information to cash holdings, impacting value relevance. But this result is significant only before IFRS adoption. When we analyzed post-IFRS adoption, the results were not significant. That is, since the adoption of IFRS standards increase accounting quality, the information of earnings, in this case gross income, became more reliable, being a better way to predict future performance of firms than cash holdings. Consequently, accrual accounting provides better matching of revenues and expenses than cash accounting and therefore makes accounting information more value relevant (Hung, 2000).

Therefore, our study seeks to contribute to cash management literature by demonstrating that discretionary accruals measured by gross income have complementary information to cash holdings and this relationship is influenced by the adoption of IFRS standards, emerging fruitful insights to the context of IFRS adoption in Latin America. In addition, the findings suggest relevant insights to earnings management literature by the analysis of discretionary accruals measured by gross income.

3.2 Related studies and hypothesis development

Accruals quality seems not to be an incrementally priced risk factor, in general, it does not affect expected returns (Core et al., 2008). Therefore, the authors suggest that accruals quality may well be manifested in other risk factors even though accruals quality itself is not a separate risk factor (Core et al., 2008).

Novy-Marx (2013) argues that strategies based on gross profitability is a way to generate value-like average excess returns, even though they are growth strategies that provide an excellent hedge for value, improving a value investor's investment opportunity set. The author found evidence that gross profits-to-assets is a powerful predictor of the cross section of returns (Novy-Marx, 2013). Additionally, the findings also suggest that gross profits-to-assets is complimentary to book-to-market ratio, contributing economically significant information above that contained in valuations, even among the largest, most liquid stocks (Novy-Marx, 2013).

Novy-Marx (2013) conclude that gross profitability can be a factor to be used by value investors when selecting their portfolios holdings since controlling for profitability increases the performance of value strategies.

Ball et al. (2016) show that cash-based operating profitability outperforms measures of profitability that include accruals, demonstrating that high average returns for profitable firms. Their findings also suggest that cash-based profitability provides stronger signal of future returns. Consequently, the authors argue that investors would be better off by just adding cash-based operating profitability to their investment opportunity set than by adding both types of measurement.

Considering the previous evidence, we aim to evaluate whether the information of discretionary accruals measured by gross profits could be value relevant, instead of the discretionary accruals measured by net profits traditionally explored in the literature. So, the main hypothesis is stated below:

H1: discretionary accruals measured by gross income are more value relevant than discretionary accruals measured by net income in the context of IFRS adoption.

Some evidence demonstrates that cash holdings are valued by the market. Loncan and Caldeira (2014) found that cash information is valued by investors up to an optimum threshold level. Pinkowitz, Stulz and Williamson (2006) found that cash holdings are valued by investors, but in lower levels when there are countries with weaker investor protection.

Our additional hypothesis aims to capture whether discretionary accruals measured by gross income have complementary information to cash holdings, and its relation can impact value relevance, as stated in H2:

H2: discretionary accruals measured by gross income complement the information of cash holdings, impacting value relevance of firms in the context of IFRS adoption.

For both hypotheses, we consider the context of mandatory adoption of international standards. García et al. (2017) show that changes from local accounting regulations to internationally approved standards increase the value relevance in Latin America. Consequently, we propose the comparison of the periods of pre- and post-IFRS adoption.

3.3 Research Design

3.3.1 Sample and data description

Our original sample include 1,246 public firms from Argentina, Brazil, Chile, Colombia, Mexico, and Peru from 2005 to 2019. From this original sample, we exclude financial and insurance firms, because its specific characteristics, totaling an initial sample of 895 public firms. We also exclude firm-year observations with null available information in all period and with negative equity to provide consistency in the estimations. Finally, we exclude firm-year observations with losses to avoid mathematical bias and firm-year observations with negative income since firms in this situation could present specific incentives for earnings management practices.

The final sample includes 811 public firms, in a total of 8,135 firm-year observations from 2005 to 2019, in an unbalanced panel data. Table 3.1 shows the sample description.

Table 3.1 Sample description

Description	Firms	Observations
Total public firms	1,246	18,690
(-) financial and insurance firms	(351)	(5,265)
(=) initial sample	895	13,425
(-) firm-year observations with null information in all period	(55)	(2,397)
(-) firm-year observations with negative equity	(8)	(545)
(-) firm-year observations with negative net income	(21)	(2,348)
(=) final sample	811	8,135

Source: the authors.

Final sample comprises 811 non-financial public firms from Latin America.

Final sample contains Argentina, Brazil, Chile, Colombia, Mexico, and Peru.

Unbalanced panel data contains 8,135 firm-year observations from 2005 to 2019.

All financial information was collected in USD.

Table 3.2 shows the segregation of the sample according to country of origin. The most part of the sample comprises firm-year observations from Brazil, in a total of 32.88%, followed by Chile (20.47%).

Table 3.2 Sample by country

Country	Freq.	Freq. %
Argentina	824	10.13%
Brazil	2,675	32.88%
Chile	1,665	20.47%
Colombia	480	5.90%
Mexico	1,263	15.53%
Peru	1,228	15.10%
Total	8,135	100%

Source: the authors.

Final sample comprises 811 non-financial public firms from Latin America, totaling 8,135 firm-year observations from 2005 to 2019.

Table 3.3 shows the segregation of the sample according to industry classification. The most representatives' industries are Consumer (37.33%), which includes Cyclical and Non-Cyclical and, Basic Materials (17.27%).

Table 3.3 Sample by industry

Industry	Freq.	Freq. %
Basic Materials	1,405	17.27%
Consumer Cyclical	1,457	17.91%
Consumer Non-Cyclical	1,580	19.42%
Educational Services	74	0.91%
Energy	202	2.48%
Healthcare	202	2.48%
Industrials	1,059	13.02%
Real Estate	604	7.42%
Technology	296	3.64%
Utilities	1,256	15.44%
Total	8,135	100%

Source: the authors.

Final sample comprises 811 non-financial public firms from Latin America, totaling 8,135 firm-year observations from 2005 to 2019.

Regarding the lowest percentages, Table 3.3 shows that Educational Services presents 0.91%, followed by Energy and Healthcare, both with 2.48%.

3.3.2 Variables and regression model

Our dependent variable is Market Capitalization (CAP), which is based on Agostino, Drago and Silipo (2011), Bilgic and Ibis (2013), García et al. (2017), Karğın (2013) and Kothari and Zimmerman (1995). We measure this variable as the market value of the firm deflated by lagged total assets (García et al., 2017). This variable aims to capture the firm's value relevance, as proposed by García et al. (2017). The authors found that there is a presence of value relevance in the introduction of IFRS adoption in Latin America, being the results stronger at higher levels of capitalization (García et al., 2017).

We include two interest variables. DA is the absolute value from regression's residuals of total accruals using net income applying model of Kothari, Leone and Wasley (2005). DA_GROSS is the absolute value from the regression's residuals of total accruals using gross income applying model of Kothari et al. (2005).

The model proposed by Kothari et al. (2005) includes the return on assets (ROA) to control the influence of different levels of firm performance (Equation 3.1).

$$\begin{aligned}
 TA_{i,t} = & \delta_0 + \delta_1(1/ASSETS_{i,t-1}) + \delta_2(\Delta SALES_{i,t} - \Delta AR_{i,t}) + \delta_3 PPE_{i,t} \\
 & + \delta_4 ROA_{i,t} + u_{i,t}
 \end{aligned}
 \tag{3.1}$$

Where,

$TA_{i,t}$ is total accruals from is the total accruals of firm i in year t , weighted by total assets of firm i in year $t-1$;

$ASSETS_{i,t-1}$ is total assets of firm i in year $t-1$;

$\Delta SALES_{i,t}$ is net revenue for year t minus net revenue for year $t-1$ for firm i , weighted by total assets for firm i in year $t-1$;

$\Delta AR_{i,t}$ is net receivables of year t minus the net receivables of year $t-1$ of firm i , weighted by total assets of firm i in year $t-1$;

$PPE_{i,t}$ is net property, plant and equipment of firm i in year t , weighted by total assets of firm i in the year $t-1$;

$ROA_{i,t}$ is net income of firm i in year t divided by total assets of firm i in year t ;

$u_{i,t}$ is the regression error term.

For the variable DA, we measured total accruals (TA) as the difference between net income and cash flow from operating activities (Dechow, Ge & Schrand, 2010; Healy, 1985; Sloan, 1996). For the variable DA_GROSS, we measured total accruals (TA_GROSS) as the difference between gross income (Novy-Marx, 2013) and cash flow from operating activities. The descriptive statistics are reported in Appendix R.

For both variables, DA and DA_GROSS, we applied cross-sectional regressions to obtain the residuals (Appendix S), that is, the discretionary accruals (Barth, Landsman & Lang, 2008; García-Teruel, Martínez-Solano & Sánchez-Ballesta, 2009; Jones, 1991; Verdi, 2006). Finally, we obtained the absolute value of these residuals similar to previous studies (Barth et al., 2008; Chen, Tang, Jiang & Lin, 2010; Dechow et al., 2010; García-Teruel et al., 2009; Rathke, Santana, Lourenço & Dalmácio, 2016; Van Tendeloo & Vanstraelen, 2005).

Considering our hypothesis H2, we also include CASH. Based on Pinkowitz et al. (2006), we calculate CASH as the change in the level of cash holdings from the year t to the year $t+1$ divided by total assets in the year t . Cash holdings include cash and cash equivalents. If the firm did not present cash and cash equivalents in a year, we consider cash and short-term investments. We include an additional variable (DA_GROSS_CASH) which is the interaction between CASH and DA_GROSS to capture the joint effect of cash and gross accruals on value relevance.

We include a control for firm size (SIZE), measured as the natural logarithm of total assets (Ball & Shivakumar, 2005; Francis, La Fond, Olsson & Schipper, 2004; García et al., 2017; Klan & Watts, 2009; Watts, 2003).

Similar to Dechow and Schrand (2004), Dechow et al. (2010) and García et al. (2017), we include earnings before interest and taxes (EBIT) and total equity (EQUITY) as fundamental accounting variables. EBIT is measured as the earnings before interest and taxes deflated by

total assets of previous year and, EQUITY is measured as total equity deflated by lagged total assets (García et al., 2017).

We include a rotation variable, which is designated as efficiency (EFFIC), and is measured as the ratio of total sales and total assets (García et al., 2017; Lang, Raedy & Wilson, 2006).

We control for debt rotation (RISK), which considers the variation in liabilities (Ahmed, Neel & Wang, 2013; Barth et al., 2008; Chen et al., 2010; García et al., 2017; Lang et al., 2006; Nikolaev, 2010; Paananen & Lin, 2009). We measured RISK as the annual variation of log total liabilities in the year t minus log total liabilities in the year $t-1$.

We also include a control for anticipated effect of the future results through the firm growth similar to García et al. (2017). We measured GROWTH as the annual variation of log total sales in the year t minus log total sales in the year $t-1$. Khan and Watts (2009) show that higher growth firms tend to present more volatility in its stock performance and are more expected to have significant losses.

We include a control of Gross Domestic Product (GDP) as a measure of country's economic development (Pinkowitz et al., 2006). GDP growth rate considers positive and negative fluctuations in GDP in a year, and is compiled by The World Bank Group. A decline in GDP rate could be considered an indicative of the economic crises in a country (Frankel & Saravelos, 2012; Iatridis & Dimitras, 2013).

Finally, we also include a control for specific characteristics of the countries. The regulatory quality (REG) captures “the perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development” (Kaufmann, Kraay & Mastruzzi, 2010, p. 4).

This variable is compiled by The World Bank Group by an initiative of the Worldwide Governance Indicator (WGI) project. The country's score is an aggregate indicator, in units of a standard normal distribution, that ranges from approximately -2.5 (low) to 2.5 (high). Appendix T shows the scores for each country of the sample by year.

In summary, Table 3.4 shows the variables definition, with calculation and data source.

Table 3.4 Variables definition

Variable	Definition	Calculation	Data source
CAP	Market capitalization	Market value deflated by lagged total assets	Thomson Reuters (Refinitiv)
DA	Absolute discretionary accruals using net income	Absolute value from regression's residuals of total accruals using net income applying model of Kothari et al. (2005)	Thomson Reuters (Refinitiv)
DA_GROSS	Absolute discretionary accruals using gross income	Absolute value from regression's residuals of total accruals using gross income applying model of Kothari et al. (2005)	Thomson Reuters (Refinitiv)
CASH	Change in cash holdings	change in the level of cash holdings from the year t to the year t+1 divided by total assets in the year t	Thomson Reuters (Refinitiv)
SIZE	Firm size	Natural logarithm of total assets	Thomson Reuters (Refinitiv)
EBIT	Earnings before interest and taxes	EBIT deflated by lagged total assets	Thomson Reuters (Refinitiv)
EQUITY	Firm total equity	Total equity deflated by lagged total assets	Thomson Reuters (Refinitiv)
EFFIC	Firm efficiency	Ratio of total sales and total assets	Thomson Reuters (Refinitiv)
RISK	Firm risk	Annual variation of log total liabilities in the year t minus log total liability in the year t-1	Thomson Reuters (Refinitiv)
GROWTH	Growth opportunities	Annual variation of log total sales in the year t minus log of total sales in the year t-1	Thomson Reuters (Refinitiv)
GDP	Gross Domestic Product	GDP growth rate by country	The World Bank Group
REG	Regulatory quality	Score that ranges from approximately -2.5 (low) to 2.5 (high)	The World Bank Group

Source: the authors

Aiming to compare the value relevance of two measures of accruals (DA and DA_GROSS) before and after the adoption of IFRS standards, we proposed the following model for H1:

$$\begin{aligned}
 CAP_{i,t} = & \beta_0 + \beta_1 Discretionary\ Accruals_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 EBIT_{i,t} \\
 & + \beta_4 EQUITY_{i,t} + \beta_5 EFFIC_{i,t} + \beta_6 RISK_{i,t} + \beta_7 GROWTH_{i,t} \quad (3.2) \\
 & + \beta_8 GDP_{i,t} + \beta_9 REG_{i,t} + u_{i,t}
 \end{aligned}$$

Where,

$CAP_{i,t}$ is the market capitalization of the firm i in year t;

$Discretionary\ Accruals_{i,t}$ is the absolute value from regression's residuals for DA and DA_GROSS;

$SIZE_{i,t}$ is natural logarithm of total assets of the firm i in year t;

$EBIT_{i,t}$ is earnings before interest and taxes deflated by lagged total assets of the firm i in the year t;

$EQUITY_{i,t}$ is total equity deflated by lagged total assets of the firm i in the year t;

$EFFIC_{i,t}$ is the ratio of total sales and total assets of the firm i in the year t ;

$RISK_{i,t}$ is annual variation of log total liabilities of the firm i in the year t minus log total liability of the firm i in the year $t-1$

$GROWTH_{i,t}$ is annual variation of log total sales of the firm i in the year t minus log of total sales of the firm i in the year $t-1$

$GDP_{i,t}$ is gross domestic product growth rate by country of the firm i in the year t ;

$REG_{i,t}$ is regulatory quality score that ranges from approximately -2.5 (low) to 2.5 (high) for the country of the firm i in the year t ;

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9$ are the estimated coefficients in the regression;

$u_{i,t}$ is the regression error term.

We expect that β_1 are higher for DA_GROSS than DA. Gross income seems to be more valuable, as demonstrated by Novy-Marx (2013). According to the author, gross profit-to-assets has the power of market predicting average returns. That is, profitable firms generate significantly higher returns than unprofitable firms, also increasing performance of value strategies (Novy-Marx, 2013). Consequently, we expect that the coefficient of discretionary accruals measured by gross income will be more value relevant than discretionary accruals measured by net income.

For H2, the proposed model is presented on Equation 3.3:

$$\begin{aligned}
 CAP_{i,t} = & \beta_0 + \beta_1 Discretionary\ Accruals_{i,t} + \beta_2 CASH_{i,t} \\
 & + \beta_3 Discretionary\ Accruals_CASH_{i,t} + \beta_4 SIZE_{i,t} \\
 & + \beta_5 EBIT_{i,t} + \beta_6 EQUITY_{i,t} + \beta_7 EFFIC_{i,t} + \beta_8 RISK_{i,t} \\
 & + \beta_9 GROWTH_{i,t} + \beta_{10} GDP_{i,t} + \beta_{11} REG_{i,t} + u_{i,t}
 \end{aligned} \tag{3.3}$$

Where,

$CAP_{i,t}$ is the market capitalization of the firm i in year t ;

$Discretionary\ Accruals_{i,t}$ is the absolute value from regression's residuals for DA and DA_GROSS;

$CASH_{i,t}$ is the change in the level of cash holdings from the year t to the year $t+1$ divided by total assets in the year t ;

$Discretionary\ Accruals_CASH_{i,t}$ is the interaction variable between Discretionary Accruals and CASH for the firm i in the year t ;

$SIZE_{i,t}$ is natural logarithm of total assets of the firm i in year t ;

$EBIT_{i,t}$ is earnings before interest and taxes deflated by lagged total assets of the firm i in the year t ;

$EQUITY_{i,t}$ is total equity deflated by lagged total assets of the firm i in the year t ;

$EFFIC_{i,t}$ is the ratio of total sales and total assets of the firm i in the year t ;

$RISK_{i,t}$ is annual variation of log total liabilities of the firm i in the year t minus log total liability of the firm i in the year $t-1$

$GROWTH_{i,t}$ is annual variation of log total sales of the firm i in the year t minus log of total sales of the firm i in the year $t-1$

$GDP_{i,t}$ is gross domestic product growth rate by country of the firm i in the year t ;

$REG_{i,t}$ is regulatory quality score that ranges from approximately -2.5 (low) to 2.5 (high) for the country of the firm i in the year t ;

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9, \beta_{10}, \beta_{11}$ are the estimated coefficients in the regression;

$u_{i,t}$ is the regression error term.

Our interest coefficient is β_3 . That is, we aim to capture the joint information of cash holdings and discretionary accruals measured by gross income on value relevance. We expect that discretionary accruals can be seen as a complement of cash information, considering the extent to which the interaction coefficient becomes significant.

For both models, we proceed with the regressions considering the period pre- and post-IFRS adoption to compare potential effects of the adoption of these standards. For this purpose, we include a dummy variable (IFRS) that takes the value of one (1) for the year post the mandatory adoption of IFRS standards and, zero (0) otherwise.

3.4 Results Discussion

We include the descriptive statistics of the variables on Table 3.5. The variables were winsorized at 1% and 99%, except for dummy, macroeconomic and country controls.

Table 3.5 Descriptive statistics of the variables

Variable	Obs.	Mean	Median	Std. Dev.	Min	Max
CAP	6,876	1.2078	0.6985	1.7584	0.0238	12.8598
DA	7,264	0.0616	0.0406	0.0682	0.0000	0.5183
DA_GROSS	6,597	0.1330	0.1020	0.1308	0.0000	0.9567
CASH	6,085	0.0044	0.0000	0.0731	-0.2213	0.3659
IFRS	8,135	0.6293	1.0000	-	-	-
SIZE	8,121	20.0065	20.1597	2.0232	13.8341	24.1025
EBIT	7,905	0.1114	0.0857	0.1073	-0.0310	0.6665
EQUITY	7,906	0.5726	0.5369	0.2672	0.0801	1.6039
EFFIC	8,121	0.7079	0.6076	0.5165	0.0000	2.7288
RISK	7,900	0.0963	0.0594	0.3384	-0.8724	1.4806
GROWTH	7,771	0.0883	0.0773	0.2857	-0.8883	1.2040
GDP	8,135	0.0302	0.0300	0.0307	-0.0592	0.1013
REG	8,135	0.3370	0.1963	0.6436	-1.0743	1.5385

Source: the authors.

CAP is market value deflated by lagged total assets

DA is the absolute value from regression's residuals of total accruals using net income applying model of Kothari et al. (2005)

DA_GROSS is the absolute value from regression's residuals of total accruals using gross income applying model of Kothari et al. (2005)

CASH is change in the level of cash holdings from the year t to the year t+1 divided by total assets in the year t

IFRS is the dummy variable that takes the value of 0 for the years pre-IFRS adoption and 1 for the years post-IFRS adoption

SIZE is natural logarithm of total assets

EBIT is earnings before interest and taxes deflated by lagged total assets

EQUITY is total equity deflated by lagged total assets

EFFIC is the ratio of total sales and total assets

RISK is annual variation of log total liabilities in the year t minus log total liability in the year t-1

GROWTH is annual variation of log total sales in the year t minus log of total sales in the year t-1

GDP is gross domestic product growth rate by country

REG is regulatory quality score that ranges from approximately -2.5 (low) to 2.5 (high)

According to Table 3.5, there is a mean value of CAP equals to 1.2078, reaching the higher value of 12.8598. DA variable presented a mean value of 0.06 while DA_GROSS presented 0.133, suggesting higher levels of accruals from DA_GROSS.

Regarding the IFRS adoption, approximately 63% of the sample comprises the period of post-IFRS adoption. GDP growth rate reached a mean value of 3.07% and a higher value of 10.13%. Regulatory quality score presents a mean value of 0.337 and a higher value of 1.5385 from Chile.

Table 3.6 shows the Mann-Whitney test for market capitalization (CAP). For this test, we proceed with the normality test (Appendix U). Since the variables are not normal, we applied a non-parametric test and Spearman correlations (Appendix V).

Table 3.6 Mann-Whitney test for CAP

CAP	IFRS = 0	IFRS = 1
Mean	1.525	1.030
Median	0.872	0.618
Std. Dev.	2.132	1.480
Obs.	2472	4404
Freq. %	35.95%	64.05%
z	12.967	
Prob > z	0.000***	

Source: the authors.

CAP is market value deflated by lagged total assets

IFRS = 0 for years pre-IFRS adoption

IFRS = 1 for years post-IFRS adoption

* / ** / *** denotes significance levels of 0.10 / 0.05 / 0.01

Table 3.6 shows that there is a difference between the two groups (pre- and post-IFRS adoption) for the variable CAP. Mean and Median post-IFRS adoption are lower than pre-IFRS. This evidence only suggests that there is a decrease in the variable after the adoption of the Standards, but not considers other effects. This decrease could be justified with the fact that the

firms tend to present higher levels of assets post IFRS adoption, especially because of fair value measurements. Consequently, there is only an effect of changing the parameter, not necessarily lower levels of value relevance.

To test our hypotheses, we proceed with Generalized Method of Moments (GMM) regressions to control for endogeneity by using instruments based on lags of the original regressors (García-Teruel et al., 2009). To ensure homoscedasticity in the residuals, we obtained the GMM estimator in two steps (Arellano & Bond, 1991). Table 3.7 shows the results for H1.

Table 3.7 Results of GMM two step regressions for CAP and Discretionary Accruals

Panel (a) – discretionary accruals using net income

Dependent Variable	CAP						
	IFRS = 0			IFRS = 1			
	Coef.	WC Rob. Std. Err.	P-value	Coef.	WC Rob. Std. Err.	P-value	
CAP Lag 1.	0.023	0.061	0.701	0.275	0.082	0.001 ***	
DA	-0.627	0.741	0.397	0.222	0.436	0.610	
EBIT	1.103	0.955	0.248	1.098	0.493	0.026 **	
EQUITY	1.037	0.356	0.004 ***	1.113	0.215	0.000 ***	
SIZE	-1.146	0.328	0.000 ***	-1.164	0.168	0.000 ***	
EFFIC	0.508	0.296	0.086 *	-0.223	0.207	0.282	
RISK	0.481	0.162	0.003 ***	0.165	0.075	0.028 **	
GROWTH	-0.184	0.181	0.308	0.094	0.072	0.195	
REG	0.431	0.786	0.583	-0.072	0.155	0.645	
GDP	-5.234	0.824	0.000 ***	-2.284	0.665	0.001 ***	
Cons	23.16	5	6.446	0.000 ***	24.014	3.493	0.000 ***
Number of obs.		1,180			3,157		
Number of groups		407			562		
Number of instruments		46			98		
Prob Chi2		102.87			137.29		
		(0.000)***			(0.000)***		
Mean VIF			1.28				
Breusch-Pagan/Cook Weisberg test			8408.07 (0.000)***				
Arellano-Bond test							
Order 1			-3.8696 (0.0001)***				
Order 2			1.3317 (0.183)				

Panel (b) – discretionary accruals using gross income

Dependent Variable	CAP					
	IFRS = 0			IFRS = 1		
	Coef.	WC Rob. Std. Err.	P-value	Coef.	WC Rob. Std. Err.	P-value
CAP Lag 1.	-0.005	0.077	0.952	0.230	0.088	0.009 ***
DA_GROSS	-0.250	0.548	0.647	0.766	0.380	0.044 **
EBIT	1.707	0.869	0.049 **	1.355	0.525	0.010 ***
EQUITY	0.802	0.344	0.020 **	1.235	0.208	0.000 ***
SIZE	-0.766	0.291	0.008 ***	-1.190	0.177	0.000 ***
EFFIC	0.360	0.308	0.243	-0.088	0.219	0.689
RISK	0.397	0.217	0.068 *	0.151	0.079	0.057 *
GROWTH	-0.380	0.166	0.022 **	0.082	0.080	0.302
REG	-0.399	0.772	0.605	-0.035	0.154	0.820
GDP	-4.238	0.959	0.000 ***	-2.286	0.685	0.001 ***
cons	15.86					
	7	5.744	0.006 ***	24.226	3.663	0.000 ***
Number of obs.		1,071			2,853	
Number of groups		369			512	
Number of instruments		46			98	
		79.06			137.68	
Prob Chi2		(0.000)***			(0.000)***	
Mean VIF			1.26			
Breusch-Pagan/Cook Weisberg test			7225.16 (0.000)***			
Arellano-Bond test						
Order 1			-3.702 (0.000)***			
Order 2			1.2281 (0.2194)			

Source: the authors.

Arellano-Bond panel data estimations

CAP is market value deflated by lagged total assets

DA is the absolute value from regression's residuals of total accruals using net income applying model of Kothari et al. (2005)

DA_GROSS is the absolute value from regression's residuals of total accruals using gross income applying model of Kothari et al. (2005)

IFRS is a dummy variable that takes the value of 0 for the years pre-IFRS adoption and 1 for the years post-IFRS adoption

SIZE is natural logarithm of total assets

EBIT is earnings before interest and taxes deflated by lagged total assets

EQUITY is total equity deflated by lagged total assets

EFFIC is the ratio of total sales and total assets

RISK is annual variation of log total liabilities in the year t minus log total liability in the year t-1

GROWTH is annual variation of log total sales in the year t minus log of total sales in the year t-1

GDP is gross domestic product growth rate by country

REG is regulatory quality score that ranges from approximately -2.5 (low) to 2.5 (high)

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Table 3.7 shows that there is a significant coefficient of DA_GROSS, that is, when we consider discretionary accruals measured by gross income, there is a significant effect on value relevance (CAP). For the other hand, the results show that DA seems to not influence the

variable CAP. Our findings support H1, demonstrating that discretionary accruals measured by gross income tend to present higher levels of value relevance than traditional measurement of net income. It is consistent with Novy-Marx (2013), who found that firms' gross profits have the power to predict average returns and are complimentary to book-to-market ratio, contributing economically significant information above that contained in valuations.

When we compare the periods of IFRS adoption, the results are significant only post-IFRS adoption. This evidence suggests that discretionary accruals measured by gross income tend to present value relevance in the context of IFRS adoption. That is, in the context of higher levels of accounting quality, this kind of information became more relevant. García et al. (2017) previous revealed the importance that the market accords to the implementation of standardized norms in an international context. Similarly, Barth et al. (2008), Bartov, Goldberg and Kim (2005), Ewert and Wagenhofer (2005) and Rawashdeh (2003) found that the application of international standards increases value relevance of accounting information.

Table 3.8 shows the results of GMM two step regressions for H2.

Table 3.8 Results of GMM two step regressions for CAP, CASH and Discretionary Accruals

Dependent Variable	CAP					
	IFRS = 0			IFRS = 1		
	Coef.	WC Rob. Std. Err.	P-value	Coef.	WC Rob. Std. Err.	P-value
CAP Lag 1.	0.106	0.085	0.211	0.218	0.115	0.058 *
CASH	-2.052	1.029	0.046 **	0.231	0.265	0.383
DA_GROSS	-0.388	0.465	0.404	0.321	0.466	0.491
DA_GROSS_CASH	16.514	6.243	0.008 ***	1.022	1.993	0.608
EBIT	1.642	0.899	0.068 *	0.823	0.788	0.296
EQUITY	0.667	0.533	0.211	1.602	0.280	0.000 ***
SIZE	-0.835	0.291	0.004 ***	-1.335	0.229	0.000 ***
EFFIC	0.103	0.368	0.780	-0.001	0.219	0.997
RISK	0.356	0.252	0.158	0.185	0.090	0.040 **
GROWTH	-0.255	0.232	0.271	0.102	0.090	0.259
REG	0.183	1.006	0.855	0.257	0.223	0.251
GDP	-5.403	1.133	0.000 ***	-2.335	0.891	0.009 ***
Cons	17.110	5.599	0.002 ***	27.025	4.683	0.000 ***
Number of obs.		672			2,123	
Number of groups		254			434	
Number of instruments		46			100	
Prob Chi2		69.84 (0.000)***			125.58 (0.000)***	
Mean VIF			1.46			
Breusch-Pagan/Cook Weisberg test			6041.52 (0.000)***			
Arellano-Bond test						

Order 1	-2.8612 (0.000)***
Order 2	0.6709 (0.5023)

Source: the authors.

Arellano-Bond panel data estimations

CAP is market value deflated by lagged total assets

CASH is the change in the level of cash holdings from the year t to the year t+1 divided by total assets in the year t

DA_GROSS is the absolute value from regression's residuals of total accruals using gross income applying model of Kothari et al. (2005)

DA_GROSS_CASH is the interaction variable of DA_GROSS and CASH

IFRS is a dummy variable that takes the value of 0 for the years pre-IFRS adoption and 1 for the years post-IFRS adoption

SIZE is natural logarithm of total assets

EBIT is earnings before interest and taxes deflated by lagged total assets

EQUITY is total equity deflated by lagged total assets

EFFIC is the ratio of total sales and total assets

RISK is annual variation of log total liabilities in the year t minus log total liability in the year t-1

GROWTH is annual variation of log total sales in the year t minus log of total sales in the year t-1

GDP is gross domestic product growth rate by country

REG is regulatory quality score that ranges from approximately -2.5 (low) to 2.5 (high)

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

According to Table 3.8, CASH and the interaction variable (DA_GROSS_CASH) presented significant coefficients. When we compare both, the interaction variable presents a higher coefficient, and it is economically significant. These results are significant only during the period pre-IFRS adoption, demonstrating that discretionary accruals measured by gross income have complementary information to cash holdings, and this information impacts value relevance.

When we analyzed post-IFRS adoption, the results were not significant. That is, since the adoption of IFRS standards increase accounting quality, the information of earnings, in this case gross income, became more reliable, being a better way to predict future performance of firms than cash holdings. According to Hung (2000), accrual accounting provides better matching of revenues and expenses than cash accounting and therefore makes accounting information more value relevant.

3.5 Robustness Check

We also include additional regressions to ensure the consistency of previous estimations by calculating DA and DA_GROSS based on the model of Larcker and Richardson (2004). Appendix R shows the descriptive statistics of the variables.

The model is presented in Equation 3.4.

$$TA_{i,t} = \delta_0 + \delta_1(1/ASSETS_{i,t-1}) + \delta_2(\Delta SALES_{i,t} - \Delta AR_{i,t}) + \delta_3 PPE_{i,t} + \delta_4 BTM_{i,t} + \delta_5 CFO_{i,t} + u_{i,t} \quad (3.4)$$

Where,

$TA_{i,t}$ is total accruals of firm i in the year t, weighted by total assets of firm i in the year t-1;

$ASSETS_{i,t-1}$ is total assets of firm i in the year t-1;

$\Delta SALES_{i,t}$ is net revenue of firm i in the year t minus net revenue in the year t-1, weighted by total assets in the year t-1;

$\Delta AR_{i,t}$ is net receivables of year t minus net receivables of year t-1 of firm i, weighted by total assets of firm i in year t-1;

$PPE_{i,t}$ is net property, plant and equipment of firm i in year t, weighted by total assets of firm i in the year t-1;

$BTM_{i,t}$ is the book-to-market ratio of firm i in year t;

$CFO_{i,t}$ is operating cash flow of firm in in year t weighted by total assets of firm i in year t-1;

$u_{i,t}$ is the regression error term.

The cross-sectional regressions to estimate the residuals are reported in Appendix W. We also measure the variables as the absolute value of the residuals. The final variables are named as DA2 and DA2_GROSS.

Table 3.9 shows the results of GMM two step regressions considering CAP as dependent variable and DA2 (Panel a) and DA2_GROSS (Panel b) as interest variables.

Table 3.9 Additional Results of GMM two step regressions for CAP and Discretionary Accruals
Panel (a) – discretionary accruals using net income

Dependent Variable	CAP					
	IFRS = 0			IFRS = 1		
	Coef.	WC Rob. Std. Err.	P-value	Coef.	WC Rob. Std. Err.	P-value
CAP Lag 1.	0.012	0.062	0.845	0.270	0.080	0.001 ***
DA2	-0.924	1.401	0.509	-0.516	0.589	0.381
EBIT	1.374	0.813	0.091 *	1.264	0.458	0.006 ***
EQUITY	0.969	0.310	0.002 ***	1.140	0.200	0.000 ***
SIZE	-1.061	0.254	0.000 ***	-1.165	0.164	0.000 ***
EFFIC	0.332	0.267	0.213	-0.235	0.196	0.230
RISK	0.369	0.149	0.013 ***	0.168	0.073	0.022 **
GROWTH	-0.154	0.187	0.410	0.100	0.070	0.154
REG	0.179	0.598	0.764	-0.060	0.152	0.695
GDP	-4.829	0.723	0.000 ***	-2.334	0.666	0.000 ***
Cons	21.663	5.120	0.000 ***	24.038	3.398	0.000 ***
Number of obs.	1,182			3,164		
Number of groups	408			562		

Number of instruments	46	98
	119.61	147.55
Prob Chi2	(0.000)***	(0.000)***
Mean VIF	1.32	
Breusch-Pagan/Cook		
Weisberg test	7605.2 (0.000)***	
Arellano-Bond test		
Order 1	-3.9226 (0.000)***	
Order 2	1.3543 (0.1756)	

Panel (b) – discretionary accruals using gross income

Dependent Variable	CAP					
	IFRS = 0			IFRS = 1		
Independent Variables	Coef.	WC Rob. Std. Err.	P-value	Coef.	WC Rob. Std. Err.	P-value
CAP Lag 1.	0.003	0.075	0.966	0.222	0.091	0.015 **
DA2_GROSS	-0.384	0.603	0.524	1.066	0.470	0.023 **
EBIT	1.228	0.823	0.136	1.432	0.478	0.003 ***
EQUITY	0.751	0.367	0.041 **	1.221	0.211	0.000 ***
SIZE	-0.700	0.255	0.006 ***	-1.191	0.176	0.000 ***
EFFIC	0.302	0.318	0.342	-0.065	0.219	0.765
RISK	0.379	0.204	0.063 *	0.160	0.078	0.040 **
GROWTH	-0.300	0.173	0.082 *	0.094	0.077	0.225
REG	-0.370	0.777	0.634	-0.013	0.150	0.931
GDP	-4.234	0.857	0.000 ***	-2.219	0.707	0.002 ***
Cons	14.669	5.054	0.004 ***	24.190	3.636	0.000 ***
Number of obs.	1,072			2,859		
Number of groups	370			512		
Number of instruments	46			98		
	70.56			128.75		
Prob Chi2	(0.000)***			(0.000)***		
Mean VIF	1.25					
Breusch-Pagan/Cook						
Weisberg test	7383.43 (0.000)***					
Arellano-Bond test						
Order 1	-3.6659 (0.000)***					
Order 2	1.2066 (0.2276)					

Source: the authors.

Arellano-Bond panel data estimations

CAP is market value deflated by lagged total assets

DA2 is the absolute value from regression's residuals of total accruals using net income applying model of Larcker and Richardson (2004)

DA2_GROSS is the absolute value from regression's residuals of total accruals using gross income applying model of Larcker and Richardson (2004)

IFRS is a dummy variable that takes the value of 0 for the years pre-IFRS adoption and 1 for the years post-IFRS adoption

SIZE is natural logarithm of total assets

EBIT is earnings before interest and taxes deflated by lagged total assets

EQUITY is total equity deflated by lagged total assets

EFFIC is the ratio of total sales and total assets

RISK is annual variation of log total liabilities in the year t minus log total liability in the year t-1

GROWTH is annual variation of log total sales in the year t minus log of total sales in the year t-1

GDP is gross domestic product growth rate by country

REG is regulatory quality score that ranges from approximately -2.5 (low) to 2.5 (high)

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Table 3.10 shows that there is a significant relationship between CAP and discretionary accruals only when we consider DA2_GROSS, that is, the discretionary accruals measured by gross income. The relationship is significant for the period of post-IFRS adoption. This evidence corroborates with previous results showed in Table 3.7.

In addition, we include additional regression as previous proposed on Table 3.7 but considering the variable LAW as country control, instead of REG.

The rule of law (LAW) captures “the perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of the contract enforcement, property rights, the policy and the courts, as well as the likelihood of crime and violence” (Kaufmann et al., 2010, p. 4). This variable is also compiled by The World Bank Group, at the initiative of the Worldwide Governance Indicator (WGI) project. The scores range from approximately -2.5 (weak) to 2.5 (strong), as demonstrated on Appendix X.

The results of this additional regression are reported on Appendix Y. As can be seen, the evidence corroborates with previous estimations on Table 3.7.

Regarding H2, we also proposed additional regression to ensure the consistency of our previous findings. Table 3.10 shows additional results of GMM two step regression considering CASH, DA_GROSS and the interaction (DA_GROSS_CASH) as interest variables.

Table 3.10 Additional Results of GMM two step regressions for CAP, CASH and Discretionary Accruals

Dependent Variable	CAP					
	IFRS = 0			IFRS = 1		
Independent Variables	Coef.	WC Rob. Std. Err.	P-value	Coef.	WC Rob. Std. Err.	P-value
CAP Lag 1.	0.105	0.081	0.195	0.224	0.114	0.050 **
CASH	-1.822	0.945	0.054 **	0.239	0.266	0.371
DA_GROSS	-0.113	0.488	0.816	0.402	0.476	0.399
DA_GROSS_CASH	16.968	5.666	0.003 ***	0.782	2.023	0.699
EBIT	1.814	0.901	0.044 **	0.809	0.829	0.329
EQUITY	0.582	0.478	0.223	1.628	0.279	0.000 ***
SIZE	-0.975	0.301	0.001 ***	-1.298	0.228	0.000 ***
EFFIC	0.297	0.349	0.394	0.054	0.207	0.794
RISK	0.301	0.291	0.301	0.190	0.087	0.029 **
GROWTH	-0.248	0.234	0.288	0.079	0.087	0.367
LAW	2.673	0.703	0.000 ***	-0.040	0.202	0.843
GDP	-5.656	0.785	0.000 ***	-1.915	1.004	0.056 *
cons	20.452	5.999	0.001 ***	26.323	4.667	0.000 ***
Number of obs.		672			2,123	
Number of groups		254			434	
Number of instruments		46			100	
Prob Chi2		92.52 (0.000)***			118.64 (0.000)***	
Mean VIF			1.43			
Breusch-Pagan/Cook Weisberg test			5925.21 (0.000)***			
Arellano-Bond test						
Order 1			-2.9559 (0.000)***			
Order 2			0.5884 (0.5562)			

Source: the authors.

Arellano-Bond panel data estimations

CAP is market value deflated by lagged total assets

CASH is the change in the level of cash holdings from the year t to the year t+1 divided by total assets in the year t

DA_GROSS is the absolute value from regression's residuals of total accruals using gross income applying model of Kothari et al. (2005)

DA_GROSS_CASH is the interaction variable of DA_GROSS and CASH

IFRS is a dummy variable that takes the value of 0 for the years pre-IFRS adoption and 1 for the years post-IFRS adoption

SIZE is natural logarithm of total assets

EBIT is earnings before interest and taxes deflated by lagged total assets

EQUITY is total equity deflated by lagged total assets

EFFIC is the ratio of total sales and total assets

RISK is annual variation of log total liabilities in the year t minus log total liability in the year t-1

GROWTH is annual variation of log total sales in the year t minus log of total sales in the year t-1

GDP is gross domestic product growth rate by country

LAW is rule of law score that ranges from approximately -2.5 (weak) to 2.5 (strong)

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

According to Table 3.10, CASH and DA_GROSS_CASH are statistically significant considering the period pre-IFRS adoption. This finding is consistent with our previous results reported on Table 3.8.

Finally, Table 3.10 also shows that LAW is statistically significant, suggesting that higher levels of rule of law seems to ensure higher levels of market capitalization. That is, countries with higher levels of rule of law seems to present more value relevance.

3.6 Concluding Remarks

The aim of this study is to analyze whether discretionary accruals measured by gross income are value relevant in the context of IFRS adoption, comparing with discretionary accruals measured by net income. In addition, we analyze whether discretionary accruals measured by gross income have complementary information to cash holdings, impacting value relevance of firms.

For this purpose, we analyzed 811 public firms from Latin America, in a total of 8,135 firm-year observations from 2005 to 2019. Through Generalized Method of Moments (GMM) two step regressions, we found that discretionary accruals measured by gross income influences value relevance post-IFRS adoption, different from the discretionary accruals measured by net income, in which we did not find significant results.

Additional findings demonstrate that discretionary accruals measured by gross income have complementary information to cash holdings, impacting value relevance only before IFRS adoption. When we analyzed post-IFRS adoption, the results were not significant. That is, since the adoption of IFRS standards increase accounting quality, the information of earnings, in this case gross income, became more reliable, being a better way to predict future performance of firms than cash holdings.

Our study is subject some limitations. There are a variety of models to estimate accruals components. We chose Kothari et al. (2005) since it is more applied in the literature nowadays. To ensure the consistency of the results, we provided additional tests with the inclusion of the model proposed by Larcker and Richardson (2004). Our results are limited to a sample of non-financial public firms from Argentina, Brazil, Chile, Colombia, Mexico and Peru for the period of 2005 to 2019.

Therefore, future studies could consider other periods and countries to compare with our findings. Since discretionary accruals measured by gross income is a new proposal, future studies could apply this measure to analyze other perspectives of accounting quality.

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CONCLUSION

The objective of this thesis is to explore the relations between cash holdings, accounting quality and cost of capital, considering the context of the adoption of IFRS standards in Latin American countries.

In the first essay, we verified the relations between cash holdings and accounting quality, by the analysis of earnings management practices in Latin American firms in the context of IFRS adoption.

Our findings show that the adoption of IFRS standards tend to reduce the scope of earnings management practices and firms tend to present lower cash levels, in consequence of better quality of financial reports and, consequently, lower levels of asymmetric information between firms and investors. Our additional results demonstrate that the benefits from the adoption of these standards are different between ADR and non-ADR firms. The impact of IFRS adoption on cash holdings are more pronounced for the group of non-ADR firms than its counterparts.

In the second essay, we verified the relations between cash holdings and cost of capital in a sample of Latin American firms, considering the adoption of IFRS standards. Our findings demonstrated that when the firms increase cost of equity post-IFRS, they also increase cash levels. Consequently, the cost of capital seems to cost more after IFRS adoption and cash holdings became sensitive to the adoption of these standards. Additional results suggest that cost of equity is sensitive to the context of IFRS adoption in non-internationalized firms. The cost of debt did not provide significant results. It can be attributed to the fact that creditors already have their own mechanisms for loans guarantees, as warranties and covenants and, privileged access to financial information of firms.

In the last essay, we verified the relations between cash holdings, discretionary accruals and value relevance in Latin America. We found evidence that discretionary accruals measured by gross income influences value relevance and, the results are sensitive to the context of IFRS adoption. Additional results demonstrated that, in context of better accounting quality, the information of income (in this case, gross income) became more reliable, being a better way to predict future performance of firms than cash holdings.

In general, our thesis explored the relations between cash holdings, accounting quality and cost of capital in Latin American countries, demonstrating that the adoption of IFRS standards influences these relations, emerging fruitful insights for future research.

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APPENDIX

Appendix A

Essay 01 - Descriptive statistics for accruals variables

Variable	Obs.	Mean	Median	Std. Dev.	Min.	Max.
TA	6872	-0.018	-0.026	0.092	-0.251	0.384
1/ASSETS	6872	0.000	0.000	0.000	0.000	0.000
SALES_REC	6872	0.076	0.037	0.216	-0.513	1.057
PPE	6872	0.427	0.398	0.290	0.000	1.255
ROA	6862	0.074	0.055	0.072	0.000	0.442
CFO	6872	0.096	0.082	0.107	-0.170	0.526
BTM	5999	1.660	0.796	3.088	0.054	21.952

Source: the authors.

TA is the total accruals as the difference between net income and cash flow from operating activities.

ASSETS is the lagged total assets.

SALES_REC is the change in sales and accounting receivables.

PPE is net property, plant and equipment.

ROA is the return on assets.

CFO is the cash from operating activities.

BTM is the ratio between the book value of equity and the company market value.

TA, SALES_REC, PPE and CFO variables are divided by lagged total assets.

Appendix B

Essay 01 - Cross-sectional regression for |DA|

Dependent variable	TA		
Independent Variables	Coef.	Robust Std. Err.	P-value
1/ASSETS	29105.69	11763.950	0.013***
SALES_REC	0.014	0.008	0.084*
PPE	-0.059	0.004	0.000***
ROA	0.251	0.028	0.000***
Const	-0.013	0.003	0.000***
Number of obs.		6851	
F (prob-F)		78.62 (0.00)***	
R-squared		0.084	
Mean VIF		1.03	
Breusch-Pagan/Cook-Weisberg test (prob)		1373.74 (0.00)***	

Source: the authors.

Cross section regression with robust standards errors.

|DA| is the absolute discretionary accruals obtained from the Kothari et al. (2005) model.

TA is the total accruals as the difference between net income and cash flow from operating activities.

ASSETS is the lagged total assets.

SALES_REC is the change in sales and accounting receivables.

PPE is net property, plant and equipment.

ROA is the return on assets.

TA, SALES_REC, PPE variables are divided by lagged total assets.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Appendix C

Essay 01 - GDP growth rate (% annual)

Year	Argentina	Brazil	Chile	Colombia	Mexico	Peru
2005	8.85	3.20	5.74	4.71	2.31	6.29
2006	8.05	3.96	6.32	6.78	4.50	7.53
2007	9.01	6.07	4.91	6.85	2.29	8.52
2008	4.06	5.09	3.53	3.26	1.14	9.13
2009	-5.92	-0.13	-1.56	1.21	-5.29	1.10
2010	10.13	7.53	5.84	4.35	5.12	8.33
2011	6.00	3.97	6.11	7.36	3.66	6.33
2012	-1.03	1.92	5.32	3.90	3.64	6.14
2013	2.41	3.00	4.05	4.57	1.35	5.85
2014	-2.51	0.50	1.77	4.73	2.80	2.38
2015	2.73	-3.55	2.30	2.96	3.29	3.25
2016	-2.08	-3.31	1.67	2.09	2.91	3.95
2017	2.67	1.06	1.28	1.35	2.12	2.52
2018	-2.48	1.12	4.02	2.57	2.14	3.98

Source: World Bank national accounts data.
GDP annual % growth rate from 2005 to 2018.

Appendix D

Essay 01 - Rule of law indicator

Year	Argentina	Brazil	Chile	Colombia	Mexico	Peru
2005	-0.55	-0.43	1.30	-0.62	-0.35	-0.68
2006	-0.57	-0.37	1.27	-0.51	-0.43	-0.69
2007	-0.59	-0.37	1.29	-0.44	-0.49	-0.73
2008	-0.68	-0.32	1.31	-0.40	-0.67	-0.70
2009	-0.68	-0.16	1.30	-0.39	-0.56	-0.61
2010	-0.59	0.04	1.34	-0.31	-0.55	-0.56
2011	-0.56	0.04	1.37	-0.26	-0.55	-0.58
2012	-0.68	-0.07	1.39	-0.35	-0.53	-0.57
2013	-0.71	-0.08	1.37	-0.41	-0.54	-0.57
2014	-0.89	-0.05	1.43	-0.29	-0.42	-0.52
2015	-0.77	-0.15	1.34	-0.27	-0.45	-0.49
2016	-0.39	-0.16	1.13	-0.28	-0.56	-0.48
2017	-0.25	-0.28	1.01	-0.36	-0.57	-0.50
2018	-0.24	-0.28	1.12	-0.41	-0.67	-0.52

Source: The World Bank Group - Worldwide Governance Indicators

Estimate of governance performance ranges from -2.5 (weak) to 2.5 (strong).

Appendix E

Essay 01 - Control of corruption indicator

Year	Argentina	Brazil	Chile	Colombia	Mexico	Peru
2005	-0.39	-0.14	1.47	-0.13	-0.27	-0.33
2006	-0.34	-0.11	1.46	-0.12	-0.26	-0.20
2007	-0.34	-0.08	1.40	-0.22	-0.27	-0.25
2008	-0.44	0.01	1.38	-0.24	-0.24	-0.19
2009	-0.44	-0.07	1.38	-0.31	-0.30	-0.31
2010	-0.36	0.05	1.50	-0.39	-0.36	-0.23
2011	-0.37	0.17	1.53	-0.29	-0.40	-0.22
2012	-0.44	-0.04	1.58	-0.39	-0.41	-0.37
2013	-0.43	-0.08	1.54	-0.41	-0.51	-0.42
2014	-0.54	-0.34	1.49	-0.37	-0.76	-0.56
2015	-0.55	-0.40	1.28	-0.30	-0.77	-0.53
2016	-0.28	-0.38	1.14	-0.32	-0.72	-0.37
2017	-0.26	-0.53	1.04	-0.37	-0.93	-0.50
2018	-0.08	-0.42	1.01	-0.30	-0.86	-0.54

Source: The World Bank Group - Worldwide Governance Indicators

Estimate of governance performance ranges from -2.5 (weak) to 2.5 (strong).

Appendix F

Essay 01 – Variables description

Variable	Name	Description	Database source
SIZE	Firm size	the natural logarithm of total assets.	Thomson Reuters (Refinitiv)
CASH	Firm cash holdings	the ratio of cash and cash equivalents and total assets.	Thomson Reuters (Refinitiv)
IFRS	IFRS mandatory adoption	the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.	IFRS Foundation
LEV	Leverage	the ratio of total debt and total assets.	Thomson Reuters (Refinitiv)
FLOW	Operating cash flow	the ratio of cash from operating activities and total assets.	Thomson Reuters (Refinitiv)
NWC	Net working capital	the current net assets minus cash and cash equivalents, divided by total assets.	Thomson Reuters (Refinitiv)
GOP	Growth opportunities	the ratio of company market value and book value.	Thomson Reuters (Refinitiv)
CAPEX	Capital expenditures	the ratio of capital expenditures and total assets.	Thomson Reuters (Refinitiv)
DIV	Dividend payment	the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.	Thomson Reuters (Refinitiv)
AUDIT	Big Four auditorship	the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.	Thomson Reuters (Refinitiv)
ADR	ADR issuers	the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.	NYSE International Listings
DA	Absolute discretionary accruals	the absolute discretionary accruals obtained from the Kothari et al. (2005) model.	Thomson Reuters (Refinitiv)
DA2	Absolute discretionary accruals	the absolute discretionary accruals from Larcker and Richardson (2004) model.	Thomson Reuters (Refinitiv)
GDP	Gross domestic product growth	the gross domestic product growth per year of each country.	The World Bank
LAW	Rule of law	the rule of law ranges from -2.5 (weak) to 2.5 (strong).	The World Bank
CORRUPT	Control of corruption	the control of corruption ranges from -2.5 (weak) to 2.5 (strong).	The World Bank

Source: the authors.

Appendix G

Essay 01 – Shapiro Wilk test

Variable	Number of obs.	W	V	Z	Prob-Z
CASH	7032	0.727	999.996	18.312	0.000
IFRS	7058	1.000	0.144	-5.136	1.000
DA	6851	0.781	783.681	17.652	0.000
DA2	5945	0.669	1047.329	18.343	0.000
SIZE	7051	0.991	33.726	9.327	0.000
DIV	5201	0.995	13.799	6.895	0.000
LEV	7051	0.975	90.743	11.951	0.000
FLOW	6763	0.943	203.173	14.071	0.000
NWC	7046	0.972	103.382	12.297	0.000
CAPEX	6463	0.846	524.840	16.562	0.000
GOP	7051	0.762	875.257	17.960	0.000
AUDIT	6957	1.000	0.710	-0.908	0.818
LAW	7058	0.760	883.102	17.984	0.000
CORRUPT	7058	0.775	826.980	17.810	0.000
ADR	7058	0.996	14.452	7.081	0.000
GDP	7058	0.975	90.096	11.933	0.000

Source: the authors.

CASH is the ratio of cash and cash equivalents and total assets.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

|DA| is the absolute discretionary accruals obtained from the Kothari et al. (2005) model.

|DA2| is the absolute discretionary accruals from Larcker and Richardson (2004) model.

SIZE is the natural logarithm of total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

LEV is the ratio of total debt and total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and short-term investments, divided by total assets.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law range from -2.5 (weak) to 2.5 (strong).

CORRUPT is the control of corruption range from -2.5 (weak) to 2.5 (strong).

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE.

GDP is the gross domestic product growth per year of each country.

Appendix H

Essay 01 - Spearman correlation coefficients

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) CASH	1															
(2) DA	<i>0.136</i>	1														
(3) DA2	<i>0.073</i>	<i>0.377</i>	1													
(4) IFRS	-0.006	<i>-0.105</i>	<i>-0.070</i>	1												
(5) SIZE	<i>0.089</i>	<i>-0.090</i>	<i>-0.024</i>	<i>0.092</i>	1											
(6) DIV	0.000	<i>-0.059</i>	<i>-0.051</i>	<i>0.041</i>	<i>0.097</i>	1										
(7) LEV	-0.016	-0.027	<i>-0.034</i>	<i>0.102</i>	<i>0.409</i>	0.011	1									
(8) FLOW	<i>0.207</i>	<i>0.216</i>	<i>0.137</i>	<i>-0.105</i>	<i>0.077</i>	<i>0.094</i>	<i>-0.114</i>	1								
(9) NWC	<i>-0.057</i>	<i>-0.065</i>	<i>-0.032</i>	<i>-0.041</i>	<i>-0.330</i>	0.001	<i>-0.225</i>	<i>-0.226</i>	1							
(10) CAPEX	<i>0.061</i>	<i>0.082</i>	<i>-0.008</i>	<i>-0.116</i>	<i>0.175</i>	<i>0.054</i>	<i>0.133</i>	<i>0.314</i>	<i>-0.206</i>	1						
(11) GOP	<i>0.210</i>	<i>0.117</i>	<i>0.050</i>	<i>-0.024</i>	<i>0.196</i>	<i>0.069</i>	<i>0.050</i>	<i>0.361</i>	<i>-0.142</i>	<i>0.23</i>	1					
(12) AUDIT	<i>0.076</i>	<i>-0.010</i>	<i>0.034</i>	<i>-0.090</i>	<i>0.278</i>	<i>0.068</i>	<i>0.163</i>	<i>0.098</i>	<i>-0.104</i>	<i>0.09</i>	<i>0.161</i>	1				
(13) ADR	<i>0.082</i>	<i>0.034</i>	<i>-0.008</i>	<i>-0.030</i>	<i>0.394</i>	<i>0.048</i>	<i>0.058</i>	<i>0.119</i>	<i>-0.186</i>	<i>0.14</i>	<i>0.055</i>	<i>0.112</i>	1			
(14) LAW	<i>-0.081</i>	<i>-0.098</i>	<i>-0.067</i>	<i>0.295</i>	<i>0.052</i>	<i>0.071</i>	<i>0.096</i>	<i>-0.112</i>	<i>0.039</i>	<i>-0.07</i>	<i>-0.028</i>	<i>0.315</i>	<i>-0.071</i>	1		
(15) CORRUPT	<i>-0.092</i>	<i>-0.011</i>	<i>-0.008</i>	<i>-0.121</i>	<i>-0.075</i>	<i>0.052</i>	<i>0.012</i>	<i>-0.037</i>	<i>0.075</i>	<i>0.01</i>	<i>-0.040</i>	<i>0.346</i>	<i>-0.066</i>	<i>0.784</i>	1	
(16) GDP	<i>-0.102</i>	<i>0.061</i>	<i>0.020</i>	<i>-0.374</i>	<i>-0.134</i>	<i>-0.009</i>	<i>-0.091</i>	<i>0.036</i>	<i>0.054</i>	<i>0.07</i>	<i>-0.045</i>	<i>-0.039</i>	<i>-0.053</i>	<i>-0.047</i>	<i>0.308</i>	1

Source: the authors.

Significant correlations at least 0.05 are in italics. High correlations are bolded.

CASH is the ratio of cash and cash equivalents and total assets.

|DA| is the absolute discretionary accruals from the Kothari et al. (2005) model. |DA2| is the absolute discretionary accruals from Larcker and Richardson (2004) model.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise. is the natural logarithm of total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise. LEV is the ratio of total debt and total assets.

FLOW is the ratio of cash from operating activities and total assets. NWC is the current net assets minus cash and short-term investments, divided by total assets.

CAPEX is the ratio of capital expenditures and total assets. GOP is the ratio of company market value and book value.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise. ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE.

LAW is the rule of law range from -2.5 (weak) to 2.5 (strong). CORRUPT is the control of corruption range from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

Appendix I

Essay 01 - Additional regression for |DA| and |DA2| – control of corrupt

(a) Panel A: the proxy for earnings management practices is the |DA| variable.

Dependent Variable		DA		
Independent Variables	Coef.	Robust Std. Err.	P-value	
DA				
Lag 1.	0.094	0.041	0.021	**
IFRS	-0.020	0.005	0.000	***
SIZE	0.039	0.007	0.000	***
DIV	0.003	0.007	0.697	
LEV	0.035	0.028	0.215	
FLOW	0.129	0.047	0.006	***
NWC	-0.020	0.029	0.494	
CAPEX	-0.030	0.044	0.489	
GOP	-0.001	0.002	0.660	
ADR	0.011	0.016	0.507	
AUDIT	0.016	0.008	0.037	**
GDP	0.000	0.000	0.506	
CORRUPT	0.009	0.008	0.260	
Const	-0.783	0.141	0.000	***
Industry control			yes	
Number of obs			3512	
Number of groups			519	
Number of instruments			91	
Wald Chi2 (prob)			61.99 (0.00)***	
Mean VIF			1.27	
Breusch-Pagan/Cook-Weisberg test (prob)			17.76 (0.00)***	
Arellano-Bond test Order 1			-9.09 (0.00)***	
Arellano-Bond test Order 2			0.52 (0.60)	

(b) Panel B: the proxy for earnings management practices is the |DA2| variable.

Dependent Variable		DA2		
Independent Variables	Coef.	Robust Std. Err.	P-value	
DA2				
Lag 1.	0.212	0.051	0.000	***
IFRS	-0.008	0.003	0.013	***
SIZE	0.019	0.006	0.002	***
DIV	0.003	0.005	0.472	
LEV	0.004	0.022	0.856	
FLOW	0.000	0.031	0.995	
NWC	0.022	0.031	0.489	
CAPEX	-0.069	0.034	0.044	**
GOP	-0.002	0.002	0.467	
ADR	0.046	0.030	0.122	
AUDIT	0.014	0.007	0.032	**
GDP	0.000	0.000	0.615	
CORRUPT	-0.004	0.008	0.627	

Const	-0.375	0.127	0.003	***
Industry control			yes	
Number of obs			3121	
Number of groups			463	
Number of instruments			91	
Wald Chi2 (prob)			51.86 (0.00)***	
Mean VIF			1.27	
Breusch-Pagan/Cook-Weisberg test (prob)			1377.49 (0.00)***	
Arellano-Bond test Order 1			-6.54 (0.00)***	
			0.81 (0.42)	
Arellano-Bond test Order 2				

Source: the authors.

GMM two-step estimation results with robust standards errors.

Robust standards errors are in italics.

Industry control was omitted by the GMM estimation in all regressions.

|DA| is the absolute discretionary accruals obtained from the Kothari et al. (2005) model.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

|DA2| is the absolute discretionary accruals from Larcker and Richardson (2004) model.

SIZE is the natural logarithm of total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

LEV is the ratio of total debt and total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and short-term investments, divided by total assets.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

GDP is the gross domestic product growth per year of each country.

CORRUPT is the control of corruption range from -2.5 (weak) to 2.5 (strong).

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Appendix J

Essay 01 – Cash holdings and IFRS adoption – control of corruption

Dependent Variable		CASH		
Independent Variables		Coef.	Robust Std. Err.	P-value
CASH				
	Lag 1.	0.381	0.061	0.000 ***
IFRS		-0.013	0.004	0.002 ***
SIZE		0.011	0.006	0.079 *
DIV		-0.004	0.005	0.394
LEV		0.011	0.027	0.690
FLOW		0.183	0.029	0.000 ***
NWC		-0.136	0.027	0.000 ***
CAPEX		-0.259	0.049	0.000 ***
GOP		0.002	0.003	0.535
ADR		-0.007	0.091	0.940
AUDIT		0.000	0.006	0.961
GDP		0.000	0.000	0.695
CORRUPT		0.002	0.009	0.816
Const		-0.183	0.132	0.166
Industry control			yes	
Number of obs			3622	
Number of groups			529	
Number of instruments			91	
Prob-Wald Chi2			117.64 (0.000)***	
Mean VIF			1.26	
Breusch-Pagan/Cook-Weisberg test (prob)			534.25 (0.000)***	
Arellano-Bond test Order 1			-6.786 (0.000)***	
Arellano-Bond test Order 2			0.217 (0.8279)	

Source: the authors.

GMM two-step regression with robust standard errors.

Robust standards errors are in italics.

Industry control was omitted by the GMM estimation in all regressions.

CASH is the ratio of cash and cash equivalents and total assets.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

LEV is the ratio of total debt and total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and short-term investments, divided by total assets.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

GDP is the gross domestic product growth per year of each country.

CORRUPT is the control of corruption range from -2.5 (weak) to 2.5 (strong).

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Appendix K

Essay 01 - Additional regression for CASH – control of corrupt

(a) Panel A: the proxy for earnings management practices is the DA variable.

Dependent Variable		CASH		
Independent Variables	Coef.	Robust Std. Err.	P-value	
CASH				
Lag 1.	0.373	0.061	0.000	***
DA	0.137	0.043	0.001	***
IFRS	-0.009	0.005	0.063	*
IFRS_ DA	-0.035	0.061	0.570	
SIZE	0.006	0.007	0.328	
DIV	-0.005	0.005	0.322	
LEV	0.007	0.026	0.785	
FLOW	0.177	0.029	0.000	***
NWC	-0.133	0.029	0.000	***
CAPEX	-0.259	0.047	0.000	***
GOP	0.002	0.003	0.617	
ADR	0.002	0.091	0.979	
AUDIT	-0.001	0.006	0.800	
GDP	0.000	0.000	0.642	
CORRUPT	0.002	0.009	0.812	
Const	-0.088	0.135	0.514	
Industry control			yes	
Number of obs			3610	
Number of groups			529	
Number of instruments			93	
Wald Chi2 (prob)			138.49 (0.00)***	
Mean VIF			1.52	
Breusch-Pagan/Cook-Weisberg test (prob)			637.65 (0.00)****	
Arellano-Bond test Order 1			-6.75 (0.00)***	
Arellano-Bond test Order 2			-0.02 (0.99)	

(b) Panel B: the proxy for earnings management practices is the |DA2| variable.

Dependent Variable		CASH		
Independent Variables	Coef.	Robust Std. Err.	P-value	
CASH				
Lag 1.	0.373	0.063	0.000	***
DA2	0.099	0.088	0.265	
IFRS	-0.010	0.006	0.095	*
IFRS_ DA2	-0.111	0.101	0.270	
SIZE	0.012	0.007	0.068	*
DIV	-0.003	0.005	0.555	
LEV	0.025	0.025	0.321	
FLOW	0.186	0.030	0.000	***
NWC	-0.147	0.031	0.000	***
CAPEX	-0.256	0.050	0.000	***
GOP	0.000	0.004	0.987	
ADR	-0.010	0.091	0.909	
AUDIT	0.001	0.007	0.910	

GDP	0.000	0.000	0.610
CORRUPT	0.002	0.009	0.791
Const	-0.201	0.135	0.138
Industry control			yes
Number of obs			3241
Number of groups			483
Number of instruments			93
Wald Chi2 (prob)			148.9 (0.00)***
Mean VIF			1.5
Breusch-Pagan/Cook-Weisberg test (prob)			576.62 (0.00)***
Arellano-Bond test Order 1			-6.19 (0.00)***
Arellano-Bond test Order 2			-0.49 (0.63)

Source: the authors.

GMM two-step estimation results with robust standards errors.

Robust standards errors are in italics.

Industry control was omitted by the GMM estimation in all regressions.

CASH is the ratio of cash and cash equivalents and total assets.

|DA| is the absolute discretionary accruals obtained from the Kothari et al. (2005) model.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

IFRS_|DA| is the interaction variable of IFRS and DA.

|DA2| is the absolute discretionary accruals from Larcker and Richardson (2004) model.

IFRS_|DA2| is the interaction variable of IFRS and DA2.

SIZE is the natural logarithm of total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

LEV is the ratio of total debt and total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and short-term investments, divided by total assets.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

GDP is the gross domestic product growth per year of each country.

CORRUPT is the control of corruption range from -2.5 (weak) to 2.5 (strong).

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Appendix L

Essay 01 - Cross-sectional regression for |DA2|

Dependent variable	TA		
Independent Variables	Coef.	Robust Std. Err.	P-value
1/ASSETS	97026.05	27824.85	0.000***
SALES_REC	0.085	0.007	0.000***
PPE	-0.030	0.004	0.000***
CFO	-0.589	0.016	0.000***
BTM	-0.001	0.000	0.001***
Const	0.044	0.002	0.000***
Number of obs		5945	
F (prob)		368.64 (0.00)***	
R-squared		0.4802	
Mean VIF		1.05	
Breusch-Pagan/Cook-Weisberg test (prob)		302.64 (0.00)***	

Source: the authors.

Cross section regression with robust standards errors.

|DA2| is the absolute discretionary accruals from Larcker and Richardson (2004) model.

TA is the total accruals as the difference between net income and cash flow from operating activities.

ASSETS is the lagged total assets.

SALES_REC is the change in sales and accounting receivables.

PPE is net property, plant and equipment.

CFO is the cash from operating activities.

BTM is the ratio between the book value of equity and the company market value.

TA, SALES_REC, PPE and CFO variables are divided by lagged total assets.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Appendix M

Essay 02 - List of Variables

Variable	Name	Description	Source of information
CASH	Firm cash holdings	the ratio of cash and cash equivalents and total assets.	Thomson Reuters (Refinitiv)
Ki	Cost of Debt	the ratio of financial interest net of tax and average total debt.	Thomson Reuters (Refinitiv)
Ke	Cost of Equity	CAPM model adjusted for emerging markets	Thomson Reuters (Refinitiv) and Damodaran database
WACC	Weighted Average Cost of Capital	Weighted Average Cost of Capital - WACC	Thomson Reuters (Refinitiv) and Damodaran database
SIZE	Firm size	the natural logarithm of total assets.	Thomson Reuters (Refinitiv)
IFRS	IFRS mandatory adoption	the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.	IFRS Foundation database
FLOW	Operating cash flow	the ratio of cash from operating activities and total assets.	Thomson Reuters (Refinitiv)
NWC	Net working capital	the current net assets minus cash and cash and equivalents, divided by total assets.	Thomson Reuters (Refinitiv)
GOP	Growth opportunities	the ratio of company market value and book value.	Thomson Reuters (Refinitiv)
CAPEX	Capital expenditures	the ratio of capital expenditures and total assets.	Thomson Reuters (Refinitiv)
DIV	Dividend payment	the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.	Thomson Reuters (Refinitiv)
AUDIT	Big Four auditorship	the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.	Thomson Reuters (Refinitiv)
ADR	ADR issuers	the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.	NYSE International Listings
MDEBT	Debt maturity	the ratio of long-term debt and total debt.	Thomson Reuters (Refinitiv)
PROFIT	Profitability	the return on assets.	Thomson Reuters (Refinitiv)
GDP	GDP growth rate	the gross domestic product growth per year of each country.	The World Bank database
LAW	Rule of law	the rule of law ranges from -2.5 (weak) to 2.5 (strong).	The World Bank database
DOI	Degree of internationalization	the ratio of foreign revenues and total revenues.	Thomson Reuters (Refinitiv)

Source: The authors.

Appendix N

Essay 02 - Shapiro-Wilk test

Variable	Obs	W	V	z	Prob>z
CASH	8,948	0.70213	1347.024	19.232	0.000
Ke	8,986	0.84181	717.997	17.555	0.000
Ki	8,242	0.25065	3154.810	21.454	0.000
WACC	7,455	0.94154	225.460	14.387	0.000
IFRS	8,986	0.99995	0.207	-4.203	1.000
SIZE	8,979	0.98896	50.079	10.446	0.000
FLOW	8,979	0.95513	203.529	14.189	0.000
NWC	8,979	0.97519	112.548	12.608	0.000
DIV	5,965	0.99698	9.575	5.960	0.000
CAPEX	8,979	0.83891	730.688	17.601	0.000
GOP	8,979	0.74314	1165.083	18.846	0.000
MDEBT	8,053	0.91105	367.001	15.715	0.000
PROFIT	8,754	0.90259	432.198	16.188	0.000
ADR	8,941	0.99656	15.556	7.325	0.000
LAW	8,986	0.76238	1078.505	18.641	0.000
GDP	8,986	0.97604	108.751	12.516	0.000

Source: the authors.

Shapiro-Wilk test for normal data.

AUDIT not performed because there are no observations on which to perform it.

CASH is the ratio of cash and cash equivalents and total assets.

Ke is the cost of equity.

Ki is the cost of debt.

WACC is the weighted average cost of capital.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash and equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law ranges from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

Appendix O

Essay 02 – Orthogonalization of interaction variables

(a) Panel A: orthogonalization of the variable Ke_IFRS

Dependent Variable	Ke_IFRS		
Independent Variables	Coef.	Rob. Std. Err.	P-value
IFRS	0,217	0,001	0.000***
Ke	0,728	0,015	0.000***
Const	-0,150	0,003	0.000***
Number of obs		8986	
Prob-F		0.000***	
R-squared		0,9319	
Breusch-Pagan/Cook-Weisberg test (prob)		522.57 (0.000)***	

(b) Panel B: orthogonalization of the variable WACC_IFRS

Dependent Variable	WACC_IFRS		
Independent Variables	Coef.	Rob. Std. Err.	P-value
IFRS	0,153	0,000	0.000***
WACC	0,764	0,009	0.000***
Const	-0,113	0,001	0.000***
Number of obs		7455	
Prob-F		0.000***	
R-squared		0,9446	
Breusch-Pagan/Cook-Weisberg test (prob)		874.99 (0.000)***	

Source: the authors.

Cross section regressions with robust standard errors.

KI_IFRS did not present multicollinearity, so we did not apply the orthogonalization in this case.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

Ki is the cost of debt.

Ke is the cost of equity.

WACC is the weighted average cost of capital.

Ke_IFRS is the interaction variable of IFRS and Ke.

WACC_IFRS is the interaction variable of IFRS and WACC.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Appendix P**Essay 02 – Spearman correlation coefficients**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) CASH	1															
(2) Ke	<i>0,145</i>	1														
(3) Ki	<i>0,061</i>	<i>0,264</i>	1													
(4) WACC	<i>0,093</i>	<i>0,487</i>	<i>0,400</i>	1												
(5) IFRS	0,007	<i>0,285</i>	<i>0,221</i>	<i>0,159</i>	1											
(6) SIZE	<i>0,109</i>	<i>0,185</i>	<i>0,082</i>	<i>-0,171</i>	<i>0,099</i>	1										
(7) FLOW	<i>0,203</i>	<i>-0,039</i>	<i>0,043</i>	<i>0,096</i>	<i>-0,094</i>	<i>0,122</i>	1									
(8) NWC	<i>-0,101</i>	<i>-0,058</i>	<i>-0,094</i>	<i>0,145</i>	<i>-0,004</i>	<i>-0,278</i>	<i>-0,176</i>	1								
(9) DIV	0,006	<i>-0,040</i>	<i>-0,029</i>	<i>-0,021</i>	<i>0,035</i>	<i>0,115</i>	<i>0,143</i>	0,022	1							
(10) CAPEX	<i>0,049</i>	<i>-0,045</i>	<i>-0,011</i>	<i>-0,084</i>	<i>-0,120</i>	<i>0,163</i>	<i>0,323</i>	<i>-0,187</i>	<i>0,070</i>	1						
(11) GOP	<i>0,215</i>	<i>0,038</i>	<i>0,051</i>	<i>-0,040</i>	<i>-0,021</i>	<i>0,254</i>	<i>0,352</i>	<i>-0,069</i>	<i>0,106</i>	<i>0,248</i>	1					
(12) MDEBT	<i>0,047</i>	<i>-0,045</i>	<i>-0,025</i>	<i>-0,269</i>	<i>0,095</i>	<i>0,416</i>	<i>0,085</i>	<i>-0,100</i>	<i>0,052</i>	<i>0,122</i>	<i>0,131</i>	1				
(13) PROFIT	<i>0,169</i>	<i>-0,144</i>	<i>-0,020</i>	<i>0,143</i>	<i>-0,152</i>	<i>-0,037</i>	<i>0,497</i>	<i>0,080</i>	<i>0,170</i>	<i>0,195</i>	<i>0,435</i>	<i>-0,066</i>	1			
(14) ADR	<i>0,106</i>	<i>0,085</i>	<i>0,024</i>	<i>0,036</i>	<i>-0,024</i>	<i>0,400</i>	<i>0,140</i>	<i>-0,149</i>	<i>0,053</i>	<i>0,141</i>	<i>0,073</i>	<i>0,127</i>	<i>0,053</i>	1		
(15) LAW	<i>-0,054</i>	<i>-0,208</i>	<i>-0,208</i>	<i>-0,337</i>	<i>0,294</i>	<i>0,047</i>	<i>-0,153</i>	<i>0,055</i>	<i>0,045</i>	<i>-0,078</i>	<i>-0,040</i>	<i>0,108</i>	<i>-0,167</i>	<i>-0,065</i>	1	
(16) GDP	<i>-0,103</i>	<i>-0,375</i>	<i>-0,281</i>	<i>-0,240</i>	<i>-0,370</i>	<i>-0,135</i>	<i>0,028</i>	<i>0,025</i>	<i>0,017</i>	<i>0,123</i>	<i>-0,011</i>	<i>-0,065</i>	<i>0,153</i>	<i>-0,044</i>	<i>-0,036</i>	1

Source: the authors.

Spearman correlation coefficients. Coefficients in italics are significant at least 5%.

CASH is the ratio of cash and cash equivalents and total assets.

Ke is the cost of equity. Ki is the cost of debt. WACC is the weighted average cost of capital.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash and equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

LAW is the rule of law ranges from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

Appendix Q

Essay 02 – Additional GMM regression of cost of equity and IFRS adoption

Dependent Variable		Cost of equity (Ke)		
Independent Variables	Coef.	Robust Std. Err.	P-value	
Ke				
Lag 1.	0.227	0.059	0.000	***
Lag 2.	-0.061	0.027	0.025	**
IFRS	-0.006	0.004	0.089	*
SIZE	-0.005	0.005	0.306	
FLOW	-0.013	0.026	0.607	
NWC	-0.036	0.028	0.188	
DIV	-0.002	0.004	0.550	
CAPEX	-0.012	0.031	0.693	
GOP	-0.003	0.002	0.208	
MDEBT	-0.005	0.007	0.437	
PROFIT	-0.039	0.029	0.177	
ADR	-0.008	0.085	0.930	
LAW	0.109	0.010	0.000	***
GDP	-0.004	0.000	0.000	***
Const	0.306	0.102	0.003	***
Industry control		yes		
Number of obs		2.572		
Number of groups		427		
Number of instruments		90		
Prob-Chi2		459.46 (0.000)***		
Arellano-Bond test				
Order (1)		-6.379 (0.000)***		
Order (2)		-0.4005 (0.6888)		
Order (3)		-1.3856 (0.1659)		

Source: the authors.

GMM two-step regression with robust standard errors.

AUDIT dropped because of collinearity.

Industry control dropped because of collinearity.

Ke is the cost of equity.

IFRS is the dummy variable that takes 1 for post-IFRS adoption years and 0, otherwise.

SIZE is the natural logarithm of total assets.

FLOW is the ratio of cash from operating activities and total assets.

NWC is the current net assets minus cash and cash and equivalents, divided by total assets.

DIV is the dividend dummy that takes 1 for cash-dividend payment years and 0, otherwise.

CAPEX is the ratio of capital expenditures and total assets.

GOP is the ratio of company market value and book value.

MDEBT is the ratio of long-term debt and total debt.

PROFIT is the return on assets.

ADR is the dummy variable that takes 1 for firms with ADR listing at NYSE stock exchange.

AUDIT is the dummy variable that takes 1 for big-4 audit firms and 0, otherwise.

LAW is the rule of law range from -2.5 (weak) to 2.5 (strong).

GDP is the gross domestic product growth per year of each country.

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01.

Appendix R

Essay 03 – Descriptive statistics of accruals variables

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
TA	7,687	-0.0155	-0.0266	0.0980	-0.2531	0.4290
TA_GROSS	6,839	0.1709	0.1161	0.1954	-0.1093	1.0190
INVACC	7,919	0.0000	0.0000	0.0000	0.0000	0.0000
SALES	7,575	0.0000	0.0000	0.0000	0.0000	0.0000
PPE	7,727	0.4094	0.3806	0.2942	0.0003	1.2371
ROA	7,900	0.0737	0.0548	0.0721	0.0004	0.4418
CFO	7,689	0.0930	0.0811	0.1107	-0.2358	0.5339
BTM	6,945	1.5741	0.7365	3.0421	0.0414	22.0084

Source: the authors

TA is total accruals measured by net income minus cash flow from operating activities, scaled by lagged total assets

TA_GROSS is total accruals measured by gross income minus cash flow from operating activities, scaled by lagged total assets

INVACC is 1 divided by lagged total assets

SALES is the change in net revenues minus the change in net receivables, scaled by lagged total assets

PPE is net property, plant and equipment scaled by lagged total assets

ROA is the ratio between net income and total assets

CFO is operating cash flow scaled by lagged total assets

BTM is the book to market ratio

Appendix S

Essay 03 – Cross sectional regressions of accruals

Panel (a) - Cross sectional regression's results of accruals using net income

Dependent Variable	TA		
Independent Variables	Coef.	Rob. Std. Err.	P-value
INVACC	-10033.5	20279.9	0.621
SALES	-392756.5	102965	0.000 ***
PPE	-0.0759	0.0042	0.000 ***
ROA	0.2451	0.0281	0.000 ***
cons	-0.0046	0.0028	0.094 *
Observations		7264	
Prob - F		103.55 (0.000)***	
R-squared		0.091	
Mean VIF		1.02	
Breusch-Pagan/Cook -Weisberg test		1168.94 (0.000)***	

Panel (b) - Cross sectional regression's results of accruals using gross income

Dependent Variable	TA_GROSS		
Independent Variables	Coef.	Rob. Std. Err.	P-value
INVACC	139746.00	43803.24	0.001 ***
SALES	-1662.98	201047.2	0.993
PPE	-0.097	0.008	0.000 ***
ROA	0.632	0.044	0.000 ***
cons	0.165	0.005	0.000 ***
Observations		6597	
Prob - F		87.22 (0.000)***	
R-squared		0.083	
Mean VIF		1.02	
Breusch-Pagan/Cook -Weisberg test		733.21 (0.000)***	

Source: the authors.

TA is total accruals measured by net income minus cash flow from operating activities, scaled by lagged total assets

TA_GROSS is total accruals measured by gross income minus cash flow from operating activities, scaled by lagged total assets

INVACC is 1 divided by lagged total assets

SALES is the change in net revenues minus the change in net receivables, scaled by lagged total assets

PPE is net property, plant and equipment scaled by lagged total assets

ROA is the ratio between net income and total assets

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01

Appendix T

Essay 03 – Regulatory quality scores

Year	Argentina	Brazil	Chile	Colombia	Mexico	Peru
2005	-0.5484	0.0392	1.3575	0.0080	0.1944	0.0312
2006	-0.6406	-0.0325	1.4738	0.1017	0.3782	0.1348
2007	-0.6682	-0.0254	1.5057	0.2414	0.3879	0.2780
2008	-0.7375	0.0539	1.5187	0.2620	0.3382	0.3454
2009	-0.8450	0.0995	1.4625	0.1483	0.2248	0.3867
2010	-0.7624	0.1524	1.4385	0.2535	0.2527	0.4503
2011	-0.7222	0.1653	1.4591	0.3592	0.2799	0.4635
2012	-0.9292	0.0939	1.5385	0.4007	0.4771	0.4920
2013	-0.9573	0.0734	1.4914	0.4029	0.4689	0.4589
2014	-1.0743	-0.0782	1.4944	0.4962	0.4260	0.5209
2015	-0.9114	-0.1927	1.3452	0.4654	0.3577	0.4913
2016	-0.4696	-0.2073	1.3731	0.4020	0.2871	0.5083
2017	-0.2912	-0.1144	1.3351	0.3409	0.1963	0.4182
2018	-0.2857	-0.3240	1.3374	0.3174	0.1584	0.4984
2019	-0.4928	-0.1778	1.2242	0.3966	0.1037	0.5639

The score ranges from approximately -2.5 (low) to 2.5 (high)

Source: Worldwide Governance Indicators (2020)

Appendix U

Essay 03 – Normality test

Variable	Obs.	W	V	z	Prob>z
CAP	6,876	0.54955	1618.159	19.575	0.000 ***
DA	7,264	0.74313	968.313	18.243	0.000 ***
DA_GROSS	6,597	0.7496	867.319	17.901	0.000 ***
CASH	6,085	0.79424	663.653	17.152	0.000 ***
SIZE	8,121	0.9869	54.429	10.639	0.000 ***
EBIT	7,905	0.7602	973.468	18.302	0.000 ***
EQUITY	7,906	0.94839	209.514	14.216	0.000 ***
EFFIC	8,121	0.90124	410.462	16.017	0.000 ***
RISK	7,900	0.91186	357.606	15.638	0.000 ***
GROWTH	7,771	0.91879	324.787	15.374	0.000 ***
GDP	8,135	0.98013	82.709	11.753	0.000 ***
REG	8,135	0.9203	331.725	15.451	0.000 ***

Source: the authors.

Shapiro-Wilk W test for normal data

CAP is market value deflated by lagged total assets

DA is the absolute value from regression's residuals of total accruals using net income applying model of Kothari et al. (2005)

DA_GROSS is the absolute value from regression's residuals of total accruals using gross income applying model of Kothari et al. (2005)

CASH is change in the level of cash holdings from the year t to the year t+1 divided by total assets in the year t

SIZE is natural logarithm of total assets

EBIT is EBIT deflated by lagged total assets

EQUITY is total equity deflated by lagged total assets

EFFIC is the ratio of total sales and total assets

RISK is annual variation of log total liabilities in the year t minus log total liability in the year t-1

GROWTH is annual variation of log total sales in the year t minus log of total sales in the year t-1

GDP is GDP growth rate by country

REG is regulatory quality score that ranges from approximately -2.5 (low) to 2.5 (high)

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01

Appendix V

Essay 03 – Spearman coefficients

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) CAP	1.000												
(2) DA_GROSS	<i>0.150</i>	1.000											
(3) DA	<i>0.086</i>	<i>0.806</i>	1.000										
(4) CASH	<i>0.097</i>	0.022	<i>0.033</i>	1.000									
(5) IFRS	<i>-0.164</i>	<i>-0.075</i>	<i>-0.051</i>	<i>-0.164</i>	1.000								
(6) EBIT	<i>0.446</i>	<i>0.162</i>	0.011	<i>0.040</i>	<i>-0.185</i>	1.000							
(7) EQUITY	<i>0.271</i>	<i>0.084</i>	<i>0.087</i>	-0.013	<i>-0.220</i>	<i>0.127</i>	1.000						
(8) SIZE	<i>0.131</i>	<i>-0.080</i>	<i>-0.109</i>	<i>-0.030</i>	<i>0.171</i>	<i>0.046</i>	<i>-0.294</i>	1.000					
(9) EFFIC	<i>0.153</i>	<i>0.033</i>	<i>-0.026</i>	<i>0.047</i>	<i>-0.122</i>	<i>0.349</i>	<i>-0.145</i>	<i>-0.183</i>	1.000				
(10) RISK	<i>0.218</i>	<i>0.073</i>	<i>0.046</i>	0.006	<i>-0.207</i>	<i>0.232</i>	<i>0.296</i>	<i>0.058</i>	-0.012	1.000			
(11) GROWTH	<i>0.243</i>	<i>0.093</i>	<i>0.056</i>	<i>0.051</i>	<i>-0.291</i>	<i>0.320</i>	<i>0.260</i>	-0.009	<i>0.091</i>	<i>0.490</i>	1.000		
(12) REG	<i>-0.095</i>	<i>-0.117</i>	<i>-0.087</i>	-0.014	<i>0.137</i>	<i>-0.145</i>	<i>0.138</i>	0.008	<i>-0.128</i>	0.011	<i>-0.031</i>	1.000	
(13) GDP	0.000	0.002	-0.007	<i>0.086</i>	<i>-0.417</i>	<i>0.133</i>	<i>0.212</i>	<i>-0.157</i>	<i>0.051</i>	<i>0.164</i>	<i>0.235</i>	<i>0.221</i>	1.000

Source: the authors

Numbers in italics are significant at least 0.05

CAP is market value deflated by lagged total assets

DA_GROSS is the absolute value from regression's residuals of total accruals using gross income applying model of Kothari et al. (2005)

DA is the absolute value from regression's residuals of total accruals using net income applying model of Kothari et al. (2005)

CASH is the change in the level of cash holdings from the year t to the year t+1 divided by total assets in the year t

IFRS is a dummy variable that takes the value of 0 for the years pre-IFRS adoption and 1 for the years post-IFRS adoption

EBIT is earnings before interest and taxes deflated by lagged total assets

EQUITY is total equity deflated by lagged total assets

SIZE is natural logarithm of total assets

EFFIC is the ratio of total sales and total assets

RISK is annual variation of log total liabilities in the year t minus log total liability in the year t-1

GROWTH is annual variation of log total sales in the year t minus log of total sales in the year t-1

REG is regulatory quality score that ranges from approximately -2.5 (low) to 2.5 (high)

GDP is gross domestic product growth rate by country

Appendix W

Essay 03 – Additional Cross-sectional regressions of accruals

Panel (a) – Cross-sectional regression's results of accruals using net income				
Dependent Variable		TA		
Independent Variables	Coef.	Rob. Std. Err.	P-value	
INVACC	216304.4	34491.88	0.000	***
SALES	-346154.3	127067	0.006	***
PPE	-0.026	0.004	0.000	***
CFO	-0.613	0.017	0.000	***
BTM	-0.001	0.000	0.000	***
cons	0.049	0.002	0.000	***
Observations		6435		
Prob - F		333.54 (0.000)***		
R-squared		0.508		
Mean VIF		1.05		
Breusch-Pagan/Cook -Weisberg test		394.31 (0.000)***		

Panel (b) – Cross-sectional regression's results of accruals using gross income				
Dependent Variable		TA_GROSS		
Independent Variables	Coef.	Rob. Std. Err.	P-value	
INVACC	468781.30	78832.34	0.000	***
SALES	-57187.41	281790.90	0.839	
PPE	-0.063	0.009	0.000	***
CFO	-0.225	0.035	0.000	***
BTM	-0.006	0.001	0.000	***
cons	0.224	0.005	0.000	***
Observations		5842		
Prob - F		37.97 (0.000)***		
R-squared		0.054		
Mean VIF		1.04		
Breusch-Pagan/Cook -Weisberg test		122.92 (0.000)***		

Source: the authors.

TA is total accruals measured by net income minus cash flow from operating activities, scaled by lagged total assets

TA_GROSS is total accruals measured by gross income minus cash flow from operating activities, scaled by lagged total assets

INVACC is 1 divided by lagged total assets

SALES is the change in net revenues minus the change in net receivables, scaled by lagged total assets

PPE is net property, plant and equipment scaled by lagged total assets

CFO is operating cash flow scaled by lagged total assets

BTM is the book to market ratio

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01

Appendix X

Essay 03 – Rule of law score

Year	Argentina	Brazil	Chile	Colombia	Mexico	Peru
2005	-0.5547	-0.4295	1.3048	-0.6233	-0.3470	-0.6837
2006	-0.5689	-0.3664	1.2720	-0.5052	-0.4315	-0.6868
2007	-0.5916	-0.3710	1.2884	-0.4359	-0.4940	-0.7295
2008	-0.6766	-0.3153	1.3133	-0.3968	-0.6679	-0.7044
2009	-0.6755	-0.1565	1.2965	-0.3885	-0.5599	-0.6138
2010	-0.5905	0.0441	1.3355	-0.3086	-0.5508	-0.5629
2011	-0.5609	0.0377	1.3659	-0.2558	-0.5492	-0.5765
2012	-0.6797	-0.0694	1.3919	-0.3539	-0.5341	-0.5744
2013	-0.7077	-0.0802	1.3678	-0.4059	-0.5445	-0.5660
2014	-0.8860	-0.0499	1.4331	-0.2919	-0.4228	-0.5211
2015	-0.7708	-0.1471	1.3441	-0.2684	-0.4471	-0.4855
2016	-0.3936	-0.1572	1.1293	-0.2788	-0.5562	-0.4820
2017	-0.2456	-0.2844	1.0117	-0.3600	-0.5667	-0.5013
2018	-0.2429	-0.2538	1.0898	-0.4063	-0.6379	-0.5298
2019	-0.4307	-0.1809	1.0736	-0.4169	-0.6581	-0.4872

The score ranges from approximately -2.5 (low) to 2.5 (high)

Source: Worldwide Governance Indicators (2020)

Appendix Y

Essay 03 – additional GMM regression including rule of law

Panel (a) – discretionary accruals using net income

Dependent Variable	CAP					
	IFRS = 0			IFRS = 1		
Independent Variables	Coef.	WC Rob. Std. Err.	P-value	Coef.	WC Rob. Std. Err.	P-value
DA	0.168	0.667	0.801	0.230	0.426	0.590
EBIT	0.746	0.864	0.388	1.126	0.497	0.023 **
EQUITY	0.992	0.430	0.021 **	1.120	0.218	0.000 ***
SIZE	-1.438	0.285	0.000 ***	-1.168	0.167	0.000 ***
EFFIC	0.466	0.276	0.092 *	-0.231	0.205	0.259
RISK	0.459	0.184	0.013 ***	0.167	0.077	0.030 **
GROWTH	-0.094	0.156	0.547	0.098	0.072	0.176
LAW	2.640	0.504	0.000 ***	-0.115	0.149	0.440
GDP	-3.958	0.579	0.000 ***	-2.246	0.725	0.002 ***
cons	29.697	5.706	0.000 ***	24.077	3.474	0.000 ***
Number of obs.		1,180			3,157	
Number of groups		407			562	
Number of instruments		46			98	
		95.01				
		(0.000)			173.57	
Prob Chi2		***			(0.000)***	
Mean VIF			1.25			
Breusch-Pagan/Cook						
Weisberg test			8265.17 (0.000)***			
Arellano-Bond test						
Order 1			-3.8696 (0.000)***			
Order 2			1.3317 (0.183)			

**Panel (b) – discretionary
accruals using gross income**

Dependent Variable	CAP					
	IFRS = 0			IFRS = 1		
Independent Variables	Coef.	WC Rob. Std. Err.	P-value	Coef.	WC Rob. Std. Err.	P-value
CAP Lag 1.	0.024	0.068	0.721	0.228	0.090	0.012 ***
DA_GROSS	-0.068	0.593	0.909	0.782	0.374	0.037 **
EBIT	0.913	1.015	0.368	1.357	0.516	0.008 ***
EQUITY	0.498	0.287	0.083 *	1.240	0.212	0.000 ***
SIZE	-1.194	0.286	0.000 ***	-1.182	0.179	0.000 ***
EFFIC	0.437	0.284	0.124	-0.077	0.214	0.718
RISK	0.482	0.247	0.051 **	0.149	0.081	0.065 *
GROWTH	-0.253	0.172	0.142	0.085	0.080	0.284
LAW	2.880	0.544	0.000 ***	-0.079	0.162	0.626
GDP	-4.298	0.587	0.000 ***	-2.234	0.742	0.003 ***
cons	25.009	5.739	0.000 ***	24.045	3.714	0.000 ***
Number of obs.		1,071			2,853	
Number of groups		369			512	
Number of instruments		46			98	
Prob Chi2		92.16 (0.000)***			167.52 (0.000)**	*
Mean VIF			1.22			
Breusch-Pagan/Cook						
Weisberg test			7091.98 (0.000)***			
Arellano-Bond test						
Order 1			-3.6671 (0.000)***			
Order 2			1.2243 (0.2208)			

Source: the authors.

Arellano-Bond panel data estimations

CAP is market value deflated by lagged total assets

DA is the absolute value from regression's residuals of total accruals using net income applying model of Kothari et al. (2005)

DA_GROSS is the absolute value from regression's residuals of total accruals using gross income applying model of Kothari et al. (2005)

IFRS is a dummy variable that takes the value of 0 for the years pre-IFRS adoption and 1 for the years post-IFRS adoption

SIZE is natural logarithm of total assets

EBIT is earnings before interest and taxes deflated by lagged total assets

EQUITY is total equity deflated by lagged total assets

EFFIC is the ratio of total sales and total assets

RISK is annual variation of log total liabilities in the year t minus log total liability in the year t-1

GROWTH is annual variation of log total sales in the year t minus log of total sales in the year t-1

GDP is gross domestic product growth rate by country

LAW is rule of law score that ranges from approximately -2.5 (low) to 2.5 (high)

* / ** / *** denotes the significance levels 0.10 / 0.05 / 0.01