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Nestor U. Salcedo
Universitat Autònoma de Barcelona, nsalcedo@esan.edu.pe

Miguel García-Cestona
Universitat Autònoma de Barcelona, Miguel.Garcia.Cestona@uab.cat

Martin Santana
Universidad ESAN, msantana@esan.edu.pe

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Corporate Governance, Ownership Structures and IT Investments. An Institutional approach.

Completed Research Paper

Nestor U. Salcedo

Universitat Autònoma de Barcelona
ESAN Graduate School of Business
nsalcedo@esan.edu.pe

Miguel García-Cestona

Universitat Autònoma de Barcelona
Miguel.Garcia.Cestona@uab.cat

Martin Santana

ESAN Graduate School of Business
msantana@esan.edu.pe

Abstract

The research aims to highlight the relationships of traditional and new ownership structures on information technology (IT) investments for firms listed on Iberoamerican stock markets after a global crisis. The study uses a neo-institutional economic framework to show the corporate governance's changes through institutional logic of ownership structures as well as IT investments growth in Iberoamerica. A literature review considers the relevance of concentrated ownership, top foreign ownership and common ownership of new institutional investors. The research design is a non-experimental longitudinal study with an annual panel data from 2009 to 2015, using 2,156 firm-year observations listed in stock market of Chile, Colombia, Mexico, Peru (MILA) and Spain (IBEX). The findings show that IT investment growth is negatively affected by concentrated ownerships and top foreign ownership, this last as unexpected situation, while it is positively affected by the new institutional investors. The contribution is to expand this research topic as continuing and permanent discussion of academics on corporate governance closer to IT approach, and vice versa.

JEL Classification: B52, C33, G34, G32, G23, M15

Keywords

Corporate Governance; Ownership Structure; Institutional Investors; Institutional Theory; IT Investments.

Introduction

Studying about the investments that firms make in information technology (IT) remains an important strategic management issue (Sabherwal, Sabherwal, Havaknor, & Steelman, 2019). In practice, firms have invested extensively in IT, and this trend continues today (Kappelman et al., 2019). For this reason, studies on IT investments have been a fruitful field. On the one hand, many researchers focus their efforts on understanding how these IT investments affect firm performance (Brynjolfsson & Hitt, 1996; Dehning & Richardson, 2002; Dehning, Richardson, & Stratopoulos, 2005; Lim, Dehning, Richardson, & Smith, 2011). On the other hand, how these IT investments are governed from the structures, processes or relationships for strategic implementation (Peterson, 2004; Sambamurthy & Zmud, 1999; Weill, 1992; Wu, Straub, & Liang, 2015). Despite some advances, the effect of corporate governance internal mechanisms on IT investment remain a relevant topic of discussion (Drnevich & Croson, 2013; Gurbaxani & Whang, 1991; Henderson & Venkatraman, 1992). In fact, few empirical studies have been developed, considering the ownership structure (Choi, Park, & Hong, 2012; Ho, Tian, Wu, & Xu, 2017; Ho, Wu, & Xu, 2011; Loh & Venkatraman, 1993; Ning, Kathuria, Karahade, & Khuntia, 2019; Ravichandran, Han, & Hasan, 2009; Zhang & Huang, 2012). Even, considering emerging economies (Choi et al., 2012; Ho et al., 2011; Ning et al., 2019).

Moreover, it is important to see the close relationship of IT with the agency problem as a way of reducing the information asymmetry (Eisenhardt, 1989; Gurbaxani & Whang, 1991; Jensen & Meckling, 1976). After each

crisis (such as dot.com or the global financial crisis, and probably the Covid-19), the academic discussion highlights the need to deepen the relationship between corporate governance and IT with the highest decision levels (Andriole, 2009; Nolan & Mcfarlan, 2005) as well as exploring further the causes of IT investment in other regions, and under other theoretical perspectives (Rojko, Lesjak, & Vehovar, 2011). For these reasons, the main goal of this document is to investigate whether changes in corporate governance, through the ownership structure, affect the IT investments in the Iberoamerican context. We can mention three important reasons that underline this objective.

First, considering an institutional framework, the Iberoamerican context becomes a promising field for studying corporate governance in evolution (Briano-Turrent & Rodríguez-Ariza, 2016; Kabbach de Castro, Crespi-Cladera, & Aguilera, 2013; Saona Hoffmann & San Martín, 2018) as well as IT investments (Hofman, Aravena, & Aliaga, 2016; Malaquias & Albertin, 2018). In fact, part of the institutional changes in developed economies have been adopted by developing economies, such as those in Latin America with a strong Iberian connection to Spain. In addition, after the global crisis, an institutional economic consolidation has emerged from that region, called the Pacific Alliance, which incorporates the first Stock Markets Integrated in Latin America (MILA), including Chile, Colombia, Mexico and Peru.

Second, under a new institutional economic perspective (Coase, 1998; North, 1986; Williamson, 2000), the growing of specific investments (e.g. IT) has allowed to reflect on organizational changes due to the reduction of agency and transaction costs (Drnevich & Croson, 2013; Gurbaxani & Whang, 1991). In fact, this search of a better understanding of the nature of IT investments led to do further research of its impact on firm performance (Lim et al., 2011), as well as research on the governance contingencies that enable its strategic implementation (Wu et al., 2015). And, more specifically, about the consequences of some corporate governance internal mechanisms such as the ownership structure or boards (Ho et al., 2011). Thus, researchers have taken the traditional approach to ownership structures such as concentrated ownership or family ownership (Ho et al., 2017; Loh & Venkatraman, 1993; Ning et al., 2019), foreign ownership (Choi et al., 2012; Ho et al., 2011) and institutional investors (Choi et al., 2012; Ravichandran et al., 2009).

Third, in relation to aforementioned perspective, the institutional comparative analysis (Aoki, 2001, 2010) broadens the scope to study other contexts with their own rules and beliefs such as developing economies over time, in addition to the growth of new institutional investors promoting the change of organizational structures with an impact on economic and firm performance (Bushee, 2004; Bushee & Noe, 2000; Ferreira & Matos, 2008; Gillan & Starks, 2000; La Porta, López-de-Silanes, Shleifer, & Vishny, 1998). In fact, academics studied, in addition to the traditional ownership structures, other categories of institutional investors to understand their impact (Bushee, 1998; Johnson & Greening, 1999; Porter, 1992), differentiating those dedicated institutional investors (long-term) from the temporary institutional investors (short-term). However, these approaches have left the window open to a type of institutional investor that emerged in developed economies: passive foreign investment management firms (Crane & Crotty, 2018) with active shareholders (Appel, Gormley, & Keim, 2016; McCahery, Sautner, & Starks, 2016; Strampelli, 2018). These institutional investors were called quasi-indexers (Bushee, Carter, & Gerakos, 2014; Chen, Huang, Li, & Shevlin, 2018) or common ownership (Posner, Scott Morton, & Weyl, 2017; Wang & Barrese, 2019). These firms (e.g. Fidelity, The Vanguard Group, State Street and BlackRock) have been growing and reconfiguring new ownership structures through asset management as traded funds, showing common control with high risk of possible concentration problems could trigger a future economic crisis (Wang & Barrese, 2019), even expanding that to developing economy contexts.

For these reasons, and considering that North America and Europe have direct influence in Iberoamerica, the study raises the following question: *How the traditional and new ownership structures affect the IT investment growth in Iberoamerican listed firms under an institutional perspective?*

An Institutional Framework in the Iberoamerican Case

An institutional framework establishes that institutions provide stability and meaning to social and economic behavior. Specifically, various authors began to address the issue to understand how institutionalism is built in organizations (Coase, 1998; North, 1986; Powell & DiMaggio, 1991; Scott, 1995; Williamson, 2000).

The type of information and knowledge required by a principal, as ownership structure, are partly a consequence of its institutional logic. This institutional logic will not only shape the internal organization and determine the governance structure, but also determine performance in terms of maximizing the firm goals and therefore of its industry through their investments (Aoki, 2001, 2010).

Hitherto, the world is changing and Iberoamerica has gone through several institutional changes in recent decades. In fact, several Latin American emerging economies together with Spain and Portugal followed part of the good practices in corporate governance due to their firms' financing tended to be internal, as concentrated ownerships, or by over-controlled banks (Shleifer & Vishny, 1997). For instance, many countries had to overcome in the nineties economic problems improving their public and private institutions, such as their capital markets, introducing rules to welcome institutional investors such as pension or mutual funds (Lefort & Walker, 2000) and, to reduce the agency problem between controlling and minority shareholders (Cueto, 2013; Lefort, 2005).

Moreover, in this regional context, one of the main problems that these countries began to face was the assumption of new ownership structures based on the privatization of former state-owned enterprises, as part of their financial restructuring and capital need (Chong & López-de-Silanes, 2004), where even foreign ownership from Spain also began to participate. These changes generated a stimulus to new national policies and regulations that adopted new corporate governance standards in the public and private sector due to world changes (e.g. OECD, World Bank, Sarbanes-Oxley act, and others), creating even regional corporate governance networks (Bedicks & Arruda, 2005).

However, after the global crisis of 2008, only Spain and some Latin American countries consolidated their economic institutional changes. In fact, the Pacific Alliance of Chile, Colombia, Peru and Mexico allowed the first Stock Markets Integration in Latin America (MILA). For these reasons, a representative sample to study the Iberoamerican case are the MILA countries, because they represent almost 50% of the Latin American GDP plus Spain. Besides, the study considers Spain because of the economic-commercial relationships with these countries, as well as the socio-cultural constraints, being a reference in the region, sharing investments, common knowledge and even some subsidiary firms created at MILA countries.

Moreover, together with Spain, MILA countries have maintained stable and positive sovereign ratings in the long term, much better than other countries from Iberoamerica, according to the three main credit rating agencies (Standard & Poor's, Moody's, Fitch), thus justifying our interest in this Iberoamerican case.

Further, recently, part of scholar empirical studies has focused on understanding from an institutional perspective the concentration of the ownership structures, for example, as family owners, in Iberoamerica, and Latin America including Spain (Briano-Turrent & Rodríguez-Ariza, 2016; Galve-Górriz & Hernández-Trasobares, 2015; Kabbach de Castro et al., 2013; Saona Hoffmann & San Martín, 2018). And only one study of those highlights the importance of foreign ownership and new different types of institutional investors (Kabbach de Castro et al., 2013). In that sense, these last decades have been times of financial innovation and economic cultural changes where Iberoamerica has not been oblivious. Notably the movement from defined-benefit pension schemes to defined-contribution retirement plans sponsored by employers. Such changes have fed the growth of a new institutional investment firms (Posner et al., 2017). Indeed, the firms Fidelity Investments and The Vanguard Group, have enjoyed strong recognition since their beginnings and together to BlackRock and State Street in these last years, reporting over \$15.5 trillion characterized as assets under management (Wang & Barrese, 2019). These institutional investors when managing important assets begin to own a significant part of firm shares that are listed, called common ownership, so that economists have begun to study the consequences of this reality (Pozen & Harnacher, 2011; Yadav, 2018).

All of this progress makes of the relationship between these internal mechanisms of corporate governance and IT investments a new field to study for the region.

In fact, regarding IT investments in Iberomerica, recent studies speak of significant growth and contribution in the region (Hofman et al., 2016; Malaquias & Albertin, 2018). For instance, one study compares developed economies with developing economies, and Latin American countries had similar IT investments growth ratios to Spain or Italy, as a percentage of total fixed capital formation, with upward trends since twenty years ago and positive contributions in all sectors of economy activity (Hofman et al., 2016). In addition, the findings of other study at the corporate level are that listed firms committed to IT investments have a larger participation of institutional investors compared to other listed firms (Malaquias & Albertin, 2018).

Thus, in this research, the main interest is to determine what ownership structures, as internal mechanisms of corporate governance, affects the IT investments growth in firms listed on Iberoamerican stock exchanges, related to the Pacific Alliance (MILA) and Spain (IBEX), after a global crisis.

Corporate Governance and IT Investment

Studies on corporate governance and information technologies have their origin since the consolidation of the agency theory related to the theory of the firm (Jensen & Meckling, 1976), where information or search costs and, decision-making costs based on computational costs, reinforce the understanding of information asymmetry as part of the principal-agent problem (Fama, 1980). From an economic perspective, this threshold allowed scholars to propose how IT investments grew creating value to firms, so these investments were no longer an exclusive competence of the technology departments, but also of the highest direction levels (Porter & Millar, 1985). Furthermore, these information technologies could be related to contracts based on behavior or objectives between principal-agent, reducing the information asymmetry (Eisenhardt, 1989); whereas, internal coordination costs or agency costs and, external coordination costs or transaction costs are significantly reduced with a strategic IT investment (Gurbaxani & Whang, 1991).

Additionally, these studies expanded its scope. On the one hand, scholars strengthened studies of IT investment effects on firm performance, breaking with the past productivity paradox (Brynjolfsson & Hitt, 1996; Dehning & Richardson, 2002; Dehning et al., 2005; Lim et al., 2011). On the other hand, the studies raised the relationship, by way of alignment, of the corporate strategy and the IT strategy (Henderson & Venkatraman, 1992), becoming the approach of an IT governance (Loh & Venkatraman, 1992) and, giving way to the empirical relationship between corporate governance and IT investment (Loh & Venkatraman, 1993; Weill & Ross, 2004). However, regarding an IT governance, scholars deepened their studies from an operational efficiency and project perspective (Drnevich & Croson, 2013), investigating a governance more oriented to contingencies, structures, processes and relationships to align corporate objectives with IT management and firm performance (Peterson, 2004; Sambamurthy & Zmud, 1999; Weill, 2004).

Despite the above, the approach and discussions for the study of a corporate government related to IT investment grew. In fact, after the dot.com crisis, discussions began on the board role regarding IT investments (Huff, Maher, & Munro, 2006; Kambil & Lucas, 2002; Nolan & McFarlan, 2005). Also, after the global financial crisis, empirical studies resumed, from an institutional perspective, the effect of ownership structures on IT investments (Ravichandran et al., 2009) or considering under the agency theory the board of directors and the ownership structure as variables that moderate the return of IT investments in an emerging market (Ho et al., 2011). Moreover, another study considered the governance indexes (G-index) on the return of the IT specific investment as an ERP (Zhang & Huang, 2012). Or under agency theory and resource dependence theory, seeing the effects of ownership structures on IT investment performance (Choi et al., 2012). Even recently, under institutional theory highlighting the concentration of family ownership on IT overinvestment or IT underinvestment (Ho et al., 2017).

In addition, from the reflection of different theoretical perspectives, theories based on governance were considered, of important need to deepen the effects of corporate governance on IT investments, integrating both the academy visions of the information systems with the business economics (Drnevich & Croson, 2013). Further, on an institutional basis of multi-business organizations, another study proposes how a corporate level and a strategic business unit could show differences regarding the types of IT investments (Reynolds & Yetton, 2015). From recent studies, a neo-institutional economic framework is strengthened as an appropriate perspective to resume empirical research that has paid limited attention to what ownership structures determine IT investment levels in different contexts (Choi et al., 2012; Ho et al., 2017, 2011; Ning et al., 2019; Ravichandran et al., 2009; Zhang & Huang, 2012).

For all these reasons, the study considers that the institutional perspective offers a comprehensive alternative to study what type of ownership structures determine changes in IT investment levels under different contexts over time.

Concentrated Ownership

Beyond the principle of separation between ownership-control (Berle & Means, 1932), one of the most discussed ownership structure is the concentration (Aguilera & Crespi-Cladera, 2016; Edmans, 2014; Shleifer & Vishny, 1997). In fact, large shareholders or blockholders may have outright firm control with less than 51% ownership depending on the context. The institutional presence through family structures, or the presence of the state as institutional investors can facilitate that control with lower ownership levels (Thomsen & Pedersen, 2000). Further, blockholders on corporate governance give rise to a diverse literature, related to several topics in financial economics and management, denominated in some cases a principal-principal problem (Kabbach de Castro et al., 2013; Young, Peng, Ahlstrom, Bruton, & Jiang, 2008).

On one hand, theoretical models examine topics such as the free-rider problem, informed trading and market microstructure, strategic information transmission, the trade-off between the ex post costs and ex-ante benefits of monitoring, and the role of incentives (Edmans, 2014; Shleifer & Vishny, 1986, 1997; Young et al., 2008). On the other hand, empirical studies have linked blockholdings to both corporate finance outcomes (such as firm value, profitability, leverage, investment, among others), analyzing the market reaction to block trades, and the private benefits of control (Lins, 2003).

As top shareholders controlling corporate operations, these powerful and dominant shareholders have stronger incentives to monitor and advice properly the manager investment decisions in the firm interest (Aguilera & Crespi-Cladera, 2016). Even, this interest tends to be higher over the short-term than the long-term. Thus, in the case on IT investments, which generally have long-term results, the effect could be different by such presence (Ho et al., 2017; Loh & Venkatraman, 1993). Thus, we present the following:

Hypothesis 1. *The IT investment growth for listed Iberoamerican firms are negatively affected by concentrated ownership.*

Top Foreign Ownership

Firms with foreign ownership search superior technological, organizational, and financial resources (Douma, George, & Kabir, 2006). These institutions can have different investment horizons and are oriented towards stock market-based measures of performance. Indeed, foreign ownerships come from portfolios with large number of investments in different industries to obtain the benefits associated with a diversified investment portfolio (Douma et al., 2006). In addition, foreign ownership tend to have longer investment horizons than individual investors, which decreases stock turnover (Huang & Shiu, 2009). Thus, the presence of foreign owners in the firm is highly valued.

Despite that, there are claims that domestic investors in developing economies establish overseas firms, registered as foreign investment firms, and then used them to invest in their local stock markets. Apparently, this problem as institutional logic is more severe for small firms, because are more illiquid and attract less public scrutiny. If the seemingly genuine foreign ownership affect small firms, then they will should show a positive relationship between foreign ownership and firm performance, since the locals firms lack the foreigners' know how and resources (Huang & Shiu, 2009).

On the other hand, the advantages will be sustainable as long as linked to the institutional context. As consequence of imperfections in capital, labor, and technological markets, foreign shareholders are, relative to domestic shareholders, in a better position to exploit their advantages (Chhibber & Majumdar, 2005). In addition, countries with stronger shareholder rights and judicial systems, government incentives and higher levels of economic development attract higher levels of foreign capital (Aggarwal, Klapper, & WYsocki, 2005).

Consequently, the direct relation between foreign ownership and firm performance is consistent with a prior research in developing economies (Tan, 2002), in addition, a last study contributes to the literature by showing a significant and positive interaction between foreign ownership and IT investment for listed small firms in a developing economy (Ho et al., 2011). According to that, even foreign ownership may influence on the returns on investment in IT innovation (Choi et al., 2012). Hence, foreign ownership could help firms to invest and deploy IT more effectively. For these reason, we present the following hypothesis:

Hypothesis 2. *The IT investment growth for listed Iberoamerican firms are positively affected by top foreign ownership.*

Institutional Investors with Common Ownership

The role of institutional investors in corporate governance is changing. A review of the 20-year period prior to 2000 claims, "despite the substantial growth of institutional ownership of firms... there is little evidence that institutional investors have acquired the kind of concentrated ownership positions required to be able to play a dominant role in the corporate governance process" (Edwards & Hubbard, 2000).

Despite that, literature on institutional owners rapidly evolved. Existing studies noted that institutional owners affect the corporate policies of those firms in which they invest in research and development (Aghion, van Reenen, & Zingales, 2013; Bushee, 1998), in corporate governance and payout policy (Aggarwal, Erel, Ferreira, & Matos, 2011; Appel et al., 2016; Crane, Michenaud, & Weston, 2016), among others.

Just recently, studies have begun to consider the effects that institutional investors may have on the interaction among those firms where they hold equity stakes at the same time. Topics already approached include the effect of common ownership on mergers and acquisitions (Harford, Jenter, & Li, 2011; Matvos & Ostrovsky, 2008) and on industry competition (Azar, Schmalz, & Tecu, 2018; He & Huang, 2017). In this common ownership literature, scholars have found to BlackRock Inc., and a few legal journals have extended the linkage to four groupings of institutional investors, specifically, Fidelity Investments Inc., The Vanguard Group, BlackRock Inc. and State Street (Yadav, 2018).

In fact, these institutional investors' behavior gives rise to another ownership pattern recently studied. Individuals who invest with them are less interested in the performance of a specific firm than the aggregate performance of a grouping of firms represented in the fund portfolio. That is, the concentration of wealth held in these funds gives opportunities to concentrate on any firm (Wang & Barrese, 2019), and influencing their investments. Certainly, previous studies initial institutional investors found that there was significant positive influence on IT investments (Choi et al., 2012; Ravichandran et al., 2009). Thus, the following:

Hypothesis 3. *The IT investment growth for listed Iberoamerican firms are positively affected by common ownership.*

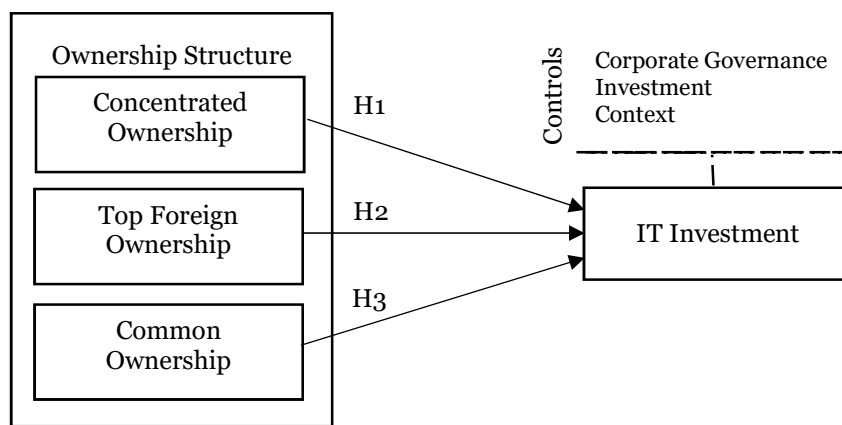


Figure 1. Model

Methodology

Design and Sample

This study is a non-experimental longitudinal design based on panel data with Iberoamerican listed firms from 2009 to 2015, after the global financial crisis and, since the Pacific Alliance creation. The stock exchange markets used are the MILA (Chile, Colombia, Mexico and Peru) and the IBEX (Spain).

The selection criteria had firms founded in their own country where they started their initial public offering, with complete information since the global financial crisis and with common industries in the five countries. More specifically, these observations included seven common industries in the studied countries as Agriculture, Forestry and Fishing (SIC 0100-0999); Mining (SIC 1000-1499); Construction (SIC 1500-1799); Manufacturing (SIC 2000-3999); Transportation, Communications, Electric, Gas and Sanitary service (SIC 4000-4999); Retail Trade (SIC 5200-5999) and; Finance, Insurance and Real Estate (SIC 6000-6799).

Regarding the data collection, 308 firms listed on stock exchange markets by year were reviewed, obtained an initial sample of 2,156 firms-year observations. Likewise, the study reviewed each superintendence of stock exchange market to download the audited annual reports. Further, the study collected information on corporate governance and financial statements from Bloomberg and Thomson Reuters Eikon.

Measurements

Regarding the measurements, the dependent variable is the IT investment. The measurement is related to the growth rate. Considering the seminal empirical paper of corporate governance on IT investment (Loh & Venkatraman, 1993), the study takes as an IT investment the spending in hardware, software, personnel, projects, consulting and service contracts. The independent variables are related to the ownership structure. The first independent variable is the concentrated ownership. This variable is widely discussed in various empirical studies, where its orientation tends to be related to risk aversion or more control by the principal

on the agent's decisions, for instance, to invest on IT (Ho et al., 2017; Loh & Venkatraman, 1993). The second variable is the top foreign ownership. Despite this variable is usually the total foreign ownership of the firm that contributing positively to the agent's decisions as IT investment (Choi et al., 2012; Ho et al., 2011), the study considers only from the top shareholders in order to reflect if there is any variation in this field towards IT investments. Finally, the third variable is the institutional investors of common ownership. Here, the study expand the previous research related to institutional investors (Choi et al., 2012; Ravichandran et al., 2009), and it considers to Fidelity Investments, Vanguard Group, BlackRock and State Street.

Variable	Definition	Data Source
IT investment	a) Annual IT spending growth rate, % change of annual IT spending amount by firm. b) Annual IT spending amount, measured as proportion of net sales due to annual IT investment index (Kapelmann et al., 2019, 2018, 2017, 2016, 2014, 2013)	Thomson Reuters Eikon / Bloomberg Terminal
Concentrated Ownership	Dummy that capture the percentage of common stock outstanding held by the top shareholders with more than 50% of firm participation.	Audited Annual Reports
Top Foreign Ownership	Dummy that capture the percentage of common stock outstanding held by the top shareholders with foreign participation.	Audited Annual Reports
Common Ownership (Institutional Investor)	Percentage of common stock outstanding held by institutional investor with common ownership members (Fidelity Investments, The Vanguard Group, State Street, BlackRock)	Thomson Reuters Eikon
Top Shareholders	Percentage of common stock outstanding held by the top ownership members.	Thomson Reuters Eikon / Audited Annual Reports
Family Shareholders	Dummy that capture the percentage of common stock outstanding held by family members.	Audited Annual Reports
Board Independence	Proportion measured as the number of independent directors serving on the board divided by the board size.	Thomson Reuters Eikon / Audited Annual Reports
Δ R+D	Annual R+D spending growth rate based on percentage change of annual R+D spending amount by firm.	Thomson Reuters Eikon / Bloomberg Terminal
Δ Net Sales	Annual growth rate of net sales	Thomson Reuters Eikon / Bloomberg Terminal
Return on Sales (ROS)	Annual ratio of operating profit to net sales	Thomson Reuters Eikon / Bloomberg Terminal
Leverage	Financial leverage, measured as long-term debt divided by total assets	Thomson Reuters Eikon / Bloomberg Terminal
Firm Size	Firm size, measured as the natural logarithm of total assets	Thomson Reuters Eikon / Bloomberg Terminal
Industry	Industries according to Standard Industrial Classification (SIC) code. 1=Agriculture, Forestry and Fishing (0100-0999); 2=Mining (1000-1499); 3=Construction (1500-1799); 4=Manufacturing (2000-3999); 5=Transportation, Communications, Electric, Gas and Sanitary service (4000-4999); 6=Retail Trade (5200-5999); 7=Finance, Insurance and Real Estate (6000-6799)	Standard Industrial Classification
Country	Countries analyzed. Peru=1, Chile=2, Mexico=3, Colombia=4, Spain=5	MILA and IBEX
Years	Study years (from 2009 to 2015)	

Table 1. Measurements

In relation to the control variables, they are divided into three types. The first type corresponds to the corporate governance variables represented by the top shareholders, family shareholders, and the board independence. The second type corresponds to the variables related to the investments represented by the growth in research and development, the growth based on sales, the return on sales, the debt ratio (leverage) and the firm size. Finally, the third type corresponds to the variables related to the context represented by the industry, the country and the years. According to the study, the main measurements are the following.

Results, Discussion and Conclusions

Ownership Structures on IT Investment Growth

The regression models of the data panels show results that open the discussion on the subject. First, the first model offers the control variables on IT investment growth. The results show that the variables top shareholders, R+D growth, net sales growth, return on sales and firm size have significant effects on IT investment growth. Of these, only R+D growth has a positive effect.

	<i>Dependent Variable: Δ IT Investment</i>			
	Control	H1	H2	H3
<i>Independent Variable:</i>				
Top Shareholders *Concentrated Ownership (d)		-0.193** (-2.42)		
Top Shareholders *Foreign Ownership (d)			-0.170* (-1.75)	
Institutional Common Ownership				0.288** (1.98)
<i>Control Variable:</i>				
Top Shareholders	-0.191*** (-2.65)	-0.198* (-1.68)	-0.198* (-1.68)	-0.030 (-0.34)
Family Shareholders (d)	0.070 (1.13)	0.070 (1.13)	0.070 (1.14)	-0.027 (-0.74)
Board Independence	-0.073 (-1.12)	-0.073 (-1.11)	-0.075 (-1.16)	-0.009 (-0.18)
Δ R+D	0.906*** (27.46)	0.906*** (27.44)	0.906*** (27.45)	0.875*** (26.25)
Δ Net Sales	-0.010** (-2.13)	-0.010** (-2.13)	-0.010** (-2.12)	-0.010 (-1.56)
Return on Sales (ROS)	-0.004*** (-4.23)	-0.004*** (-4.24)	-0.004*** (-4.26)	-0.003*** (-10.97)
Firm Size (ln Total Assets)	-0.102*** (-2.74)	-0.102*** (-2.74)	-0.103*** (-2.75)	-0.020 (-0.68)
Leverage	0.000 (0.47)	0.000 (0.47)	0.000 (0.48)	-0.001*** (-2.90)
<i>Fixed Effect:</i>				
Industry (SIC)	YES	YES	YES	YES
Country	YES	YES	YES	YES
Year	YES	YES	YES	YES
N	1795	1795	1795	800
df_m	12	13	13	13
df_r	307	307	307	153
F	194.188	180.247	180.672	510.49
p	0.000	0.000	0.000	0.000
r2_w	0.882	0.882	0.882	0.914
r2_b	0.559	0.559	0.554	0.916
r2_o	0.815	0.815	0.814	0.913

Marginal effects; t statistics in parentheses. * p<0.1, ** p<0.05, *** p<0.01
(d) for discrete change of dummy variable from 0 to 1

Table 2. Models of Ownership Structures on IT Investments

Regarding the second model, it retains the same control variables with significant levels on IT investment growth. On the concentrated ownership side, it shows effects with negatively significant levels on IT investment growth. This confirms the institutional implications of concentrated ownership structures, in which, under their traditional power and conservativeness, the principals can demonstrate their institutional pressure as risk aversion by conditioning the agent's decision to low IT investment (Loh & Venkatraman, 1993; Ning et al., 2019). In that sense, the hypothesis **H1 is supported**.

Similarly, the third model shows that the control variables of the first and second models maintain significant levels on IT investment growth. Likewise, the main foreign ownership structure, as an institutional feature, has an important negative effect on IT investment growth. This result demonstrates that foreign ownership does not necessarily affect investments in a positive way. Possibly, because these foreign owners, being the main ones, could show an institutional logic described previously (Huang & Shiu, 2009), where domestic investors in developing economies establish overseas firms, registered as foreign ownership facing the Iberoamerican context, and they discourage the agent's decisions in matters of IT investments. Therefore, its effect ends up being negatively significant on IT investment growth. Thus, the hypothesis **H2 is rejected**.

Finally, the fourth model shows a variation in terms of the control variables that support it. While the R+D growth and the return on sales are preserved, the variables top shareholders, net sales growth and firm size no longer exert a significant influence. Despite this, leverage shows a significant negative effect on IT investment growth. Similarly, institutional investors with common ownership show significant positive effect on IT investment growth. Unlike the top foreign ownership, the institutional investors with common ownership are in a continuous growth of the Iberoamerican countries assuming the institutional challenge of better integrating the information, information asymmetry reduction, of the agents with the principals. In fact, these institutional investors are already part of practically all the firms listed on IBEX in Spain. In that sense, the hypothesis **H3 is supported**.

The study contextualizes its research objectives in Iberoamerica using an institutional framework. Likewise, under the institutional perspective, it takes ownership structures as institutions capable of affecting the investments over which it has participation and power. Further, and under this perspective, this corporate governance internal mechanism shows its significant importance at the time of deciding IT investment. The study findings have several implications of theoretical and practitioner approach.

Theoretical Implications

At a theoretical level, the study contributes to knowledge by expanding the studies that relate corporate governance to IT investments. In fact, the study focus on the institutional perspective to take ownership structures as institutions and compare them, within Iberoamerican stock markets, in different industrial markets and iberoamerican countries after the global financial crisis. This denotes a control by both time, countries, industries and even the firm size under study. Scholars could deepen multilevel studies of how institutional constraints have an important role in defining agents' decisions related to IT investment. Another important point is to consider the full participation of foreign ownership, or family participation as institutional presence. Even a recent study addresses the initiative to see the impact of the concentrated ownership structure with family participation on IT overinvestment or subinvestment (Ho et al., 2017). Future studies could consider the other possible ownership structures, including new institutional investors of common participation if they condition the IT overinvestment or subinvestment.

The study has hypothesized and tested, under an institutional perspective, how the ownership structures called concentrated ownership (H1), top foreign ownership (H2), or common ownership of institutional investors (H3) affect IT investment growth in firms listed in Iberoamerican stock markets. It demonstrates that there are significant effects of these corporate governance internal mechanisms on the IT investment growth through regression of data panel with robustness and models for each ownership structure. Future research should develop studies to expand other ownership structures, and other emerging contexts.

Practitioner Implications

At the practitioner level, the study provides a critical look at the reality of corporate governance on IT investments in Iberoamerica. Discussions in other contexts are clear, high levels of control and participation of firms must take action on IT investment decisions. Mainly, this allows us to understand that owners and shareholders cannot be oblivious to the IT decisions. Above all, because these IT investments would support part of the internal mechanisms to reduce the information asymmetry between principal and agent.

Respect to the concentrated ownership, the result is negatively significant on IT investment growth. This confirms that in Iberoamerica the theory related to ownership and control is fulfilled, as well as institutional pressure due to concentration and, consequently, reluctance to the agent's decisions on IT investment.

In the case of the top foreign ownership, the study shows a particular significant negative effect on IT investment growth. Although prior studies regarding total foreign ownership consider positive effects on investments, the effect of top foreign ownership is similar to the concentrated ownership, being foreign owner responsibility to control the agent decisions related to IT investment.

Finally, in relation to the institutional investors with common ownership, the results show a significant positive effect on IT investment. This result is relevant to reaffirm that a future study may consider total foreign ownership and compare it with the result of the second model mentioned above. Likewise, the result shows that these types of institutional investors gain relevance on IT investment. In fact, several recent studies highlight the importance of monitoring the behavior of these institutional investors, as they could trigger profound changes in ownership structures and consequently on the agent decisions in the firms.

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