Journal of Economics and Business 63 (2011) 251–277

Contents lists available at ScienceDirect

Journal of Economics and Business

Outside directors, board interlocks and firm performance: Empirical evidence from Colombian business groups

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ARTICLE INFO

Article history:
Received 3 August 2009
Received in revised form 31 December 2010
Accepted 17 January 2011

JEL classification:
G32
L14
L22

Keywords:
Outside directors
Board interlocks
Busy directors
Corporate governance
Firm performance
Control contestability
Colombian corporations

ABSTRACT

We investigate the relation of board structure through the appointments of outside directors and the role of busy directors on firm return on assets within an environment of no regulation for privately held firms and voluntary adoption of corporate best practices for security issuers with family controlling blockholders. This study relies on a sample of an average of 335 firms per year for the 1996–2006 period, where 244 are private firms and 285 are affiliated to one of the seven largest non-financial business groups in the country. Five of these groups were, in 2006, still family-controlled. We find a positive relation between both the ratio of outside directors, and the degree of board interlocks, with firm return-on-assets. Outside busy directors turned out to be key drivers of improved firm performance. Appointments of outsiders are endogenous to firm ownership structure. Blockholder activism as well as contestability becomes an internal mechanism that improves director monitoring and ex-post firm valuation.

1. Introduction

Investor protection through corporate and equity law guarantees shareholders' voting rights and claims on firms' cash flow. The aim is to regulate the behavior of market participants by limiting equity issuers' ability to abuse their information advantage over outsiders and minority shareholders. Latin

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doi:10.1016/j.jeconbus.2011.01.002

America does not score well on corporate governance evaluations, and according to Chong and Lopes-de-Silanes (2007), only Argentina, Brazil, Chile and Colombia have undertaken partial equity reforms in corporate and equity law since 1990. This reflects the lag in protecting private equity and fostering good corporate practice across the region.[1]

Several studies on U.S. board structure and firm performance for periods preceding 1992 have stressed the lack of correlation between board independence and corporate capitalization (Bhagat and Black, 2002; Hermalin and Weisbach, 1991), but more recent studies have assessed the effectiveness of corporate governance reforms during the last decade. The most representative are those by Dahya and McConnell (2007) for the U.K. and Choi, Park, and Yoo (2007) for Korea, both of which find strong evidence of positive effects from such reforms on firms' market capitalization. These equity law reforms implied new requirements for a minimum of independent members on boards of directors for all security issuers and listed corporations in the stock market.

Despite the importance of corporate governance issues in public debate and the international agenda of multilateral institutions in promoting good corporate practices across corporations in emerging markets, there are few case studies regarding the effects of board independence and directorate interlocking on firm performance in Latin America from the financial economics perspective. Moreover, most of the empirical studies on board independence and firm value in emerging markets are based on samples of listed firms and little is known regarding about the effect of best practices across privately held firms with controlling family blockholders.

Business groups are the organizational scheme for entrepreneurial development across Latin America. This organization was supported by governments during the 20th century as part of the import-substituting industrialization policy implemented in developing economies regardless of their factor endowments. The process covered countries rich in natural resources, such as Brazil, as well as poorly endowed countries like South Korea, Malaysia and Taiwan. Family business groups in Colombia and other countries in the region were founded where the industrialization process was eased by such exogenous factors as the natural protection associated with poor infrastructure development and high transportation costs, the scarcity of manufactured raw materials in the international markets, and the need for vertical integration of consumer goods production during World War II years.

Endogenous factors also set the necessary conditions for entrepreneurial development. Industrialization became possible with the urbanization process and capital accumulation related to the evolution of former international trade in commodity-exporting sectors, such as the coffee industry, that allow the financing of industrial projects and the formation of an internal demand for manufactured goods. This process accelerated after 1950 with the economic policy regarding tariff protection, government direct funding, tax exceptions, cross-subsidies, foreign investment regimes and the development of domestic financial institutions.[2]

This study evaluates the effect of board structure – through the appointment of outside directors and the role of director interlocking and busy directors – on firms' return on assets in an environment of no regulation and voluntary adoption of corporate best practices. The study relies on a unique dataset that includes listed companies and privately held firms, most of them affiliated with family business groups where it was possible to trace and measure information on boards, equity rights, voting rights, and controlling blockholders. Private firms represent around 73 percent of the working sample. Thus, this study contributes to the literature of boards in emerging markets in general and for Latin America in particular by providing new empirical evidence on the relations of firms' governance structures through board composition when families are still active as large shareholders, affiliation predominates as organizational structure, and large domestic companies who are incumbents and some cases are multinationals have not become public in times where corporate governance has become a prerequisite for further development of the capital market in the region.

This document is organized as follows. Section 2 reviews the literature of interlocking directorates that supports the working hypotheses. Section 3 describes the database, its main characteristics and

[1] For instance, the Sao Paulo stock exchange set the Novo Mercado in 2000, Chile imposed its IPOs Law in 2000, Argentina issued the *Ley de Transparencia* in 2001, and Colombia undertook equity issuer reform by the decree Law 964 of 2005.

[2] For more details on business groups in emerging markets see the review of Khanna and Yafeh (2007). For the details of the history concerning Colombian entrepreneurial elites since the 19th century, see the study collected by Davila (2002).

the sources of primary information. It also discusses the main methodological issues regarding the measure of board interlocks and outside directors as well as analyses the measurement results and trends. Section 4 presents the econometric results regarding ROA determinants when controlling by board structure and demographic indicators, ownership and blockholder contestability proxies, and firm financial and idiosyncratic independent variables. Section 5 concludes.

2. Theoretical framework

Interlocking directorates or multiple directorships have been studied since 1932 when *The Modern Corporation and Private Property* was published (1932). An interlocking directorship is present when a person serves on the board of more than one corporation, and thereby generates a link or interlock between the companies. In his review of the subject, Mizruchi (1996), mentions that interlocks have been analyzed as mechanisms of collusion, as mechanism of cooptation, as monitoring mechanisms, and as reflections of social cohesion. However, "if interlocks are to be worth studying, it is essential that they be shown to have consequences for the behavior of firms" (p. 280). For emerging markets, one could add the condition that one must first be able to show its presence in today's corporations.

Among the first empirical papers on interlocking, Dooley (1969) found that the 250 largest corporations in 1965 tended to have the most interlocks. Management-controlled companies tended to avoid interlocks while nonfinancial corporations tended to have relatively more interlocks, and interlocks were proportionally more common among competing firms. In a couple of regressions, he found that interlocks between nonfinancial and financial corporations, increased as the nonfinancial corporation became less solvent and as its assets increased. An additional insight was that interlocks seemed more frequent among firms within an industry, which was in accord with the view that interlocks are mechanisms to reduce competitive uncertainty.

Zajac (1988) used data on U.S. industrial firms to contest the findings and insights of Dooley. By grouping the firms in a sample of Fortune 500 companies in 1969 according to four-digit SIC codes, instead of the two-digit codes used in previous studies, he found no differences in the number of interlocks among the selected industries and various groups of randomly selected firms. He concluded that "the results of both the disaggregated, firm-by-firm analysis and the comparative analysis suggest that interlocking directorates among competing firms are not significant in number and probably not significant in meaning" (p. 436). This result is important since links between industry-related firms are common in emerging economies, given that some or most have belonged to the same business group. Thus, interlocks can be more frequent in firms affiliated with business groups relative to non-affiliated firms.

One of the few, longitudinal studies of the creation of interlocks, Mizruchi and Stearns (1988) used data on 22 large U.S. corporations from 1956 to 1983 and posed as a research question whether the number of financial representatives added to a firm's board is explained by its initiation of financial ties (size measured by a firm's total assets, debt structure and profitability measured by ROA) as well as by economic variables like the scarcity of capital, the stage of the business cycle, and the aggregate demand for capital among all businesses in the economy. Their findings were that firm size was not important in the appointment of financial representatives to the board and that the more insolvent and less profitable firms were more likely to appoint financial representatives to their boards. Also, aggregate demand for capital and periods of expansion were positively related to financial appointments.

Most recent studies of interlocking directorship and its effect on performance have been done for developed markets like those in the United States, Europe and Australia. For instance, Ferris and Jagannathan (2001) using a sample of 6089 firms contained in Compustat for the year 1995, report that multiple directorships "are not a pervasive phenomenon" (p. 32) since only 13 percent of directors in that sample held more than one board seat. Their empirical exercise looked for the variables that best explained the number of directorships held per director, and their results corroborated some previous insights. They found that larger firms, firms with a great number of board seats, and more profitable firms were more prone to extend or have directors sit on multiple boards. Board equity ownership and regulated firm variables were related negatively though.

In a related paper, Ferris, Jagannathan, and Pritchard (2003) presented different measures of what they call multiple directorships for a sample of 3190 firms for the year 1995. Again, they found that multiple directorships or interlocks are not common and that "multiple directorships are primarily a large-firm phenomenon" (p. 1091). Their calculations show that 85 percent of directors held just one directorship, and 10 percent held two. Their empirical exercise concerned the main explanations for the number of directorships. They found evidence consistent with a reputational effect in the market for directors. Variables like age, prior firm performance, and size were positively related to directorships.

Fich and Shivdasani (2006) used a different metric from Ferris et al., and defined an outside director as busy "if he/she served on three or more boards" (p. 695). They proposed the metric of "busy board," defined as a dummy variable with a value of 1 if 50 percent or more of the board's outside directors are busy. For the period 1989–1995, surprisingly, "52% of the outside directors in the sample are classified as busy" (p. 696) and 21.4 percent of the firms had a busy board. Their research then looked at the effect of such interlocking metrics on firm performance. Both the busy outside directors and the busy board metric are negative and statistically significant related to the market-to-book ratio. The economic impact is important, and their research highlights another important factor. The effects of busy boards (multiple interlocks) are "sensitive to how the presence of busy directors is measured" (p. 701). In many cases, CEOs sit not only on their own boards but also on other companies' boards, creating a different type of interlock.

Fich and White (2005) studied reciprocal CEO interlocks; i.e., the CEO of one company sits on the board of a second company and the second company's CEO sits on the first company's board. Using data for 576 firms in 1991, these authors tried to find the determinants of reciprocal CEO interlock occurrence. The average number of reciprocal CEO interlocks was 0.13. Having the CEO on the nominating committee and board reputation were the two managerial factors favoring reciprocal interlocking. Tobin's *Q* and tenure of the CEO with the firm were also positively related with the reciprocal interlocks. This research is important for the finding that the CEO's presence on the nominating committee affects board composition. The main insight is that "a reciprocal CEO interlock is more likely to be an instrument that enhances a CEO's private interests and is less likely to be a corporate governance feature for advancing the interests of the company's shareholders" (p. 193).

One of the main tasks assigned to boards is to monitor management. Devos, Prevost, and Puthenpurackal (2009) analyzed whether interlocked directors and connected boards can be associated with weak governance. To accomplish this task, they focused on "interlocked directors that involve one inside director and one outside director since these types of interlocks are the most likely to compromise the monitoring effectiveness of boards"(p. 864). Using a sample of about 2942 firms over the years 2001–2003, they found that the incidence of interlocks declined from 71 in 2001 to 29 in 2003. The most common occurrence of interlocks is with CEO outsiders. In one empirical exercise, they tested the relationship between interlocks, as defined, and firm performance (Tobin *Q* and ROA). Their main result in the multivariate analysis is that interlocks do not appear to significantly lower firm value.[3]

Director interlocks have also been studied in other developed economies. For instance, Roy, Fox, and Hamilton (1994) studied the changes in interlocking directorates for all listed companies on the New Zealand Stock Exchange in the years 1987, 1990, and 1993. Their definition of an interlocking directorship is a person serving on the board of more than one company. Their results show a decrease in the number of potential director interlocks (the potential ties a company has through the directorships held by its board members) from 5.6 in 1987 to 3.3 in 1993. A comparison with data from Australian studies shows a mean of 1.2 directorships per director in Australia in 1991 and 1.23 in New Zealand in 1990, a finding of no statistical difference.

Loderer and Peyer (2002) studied boards of directors for all Swiss firms listed in the ZSE in 1980, 1985, 1990, and 1995. Their conceptual metric is called board overlap, which is measured by the actual

[3] There are other related studies for the US similar to those reviewed. We can highlight the studies of Chhaochharia and Grinstein (2007), and the one by Perry and Peyer (2005).

number of directors two firms have in common. This definition resembles the reciprocal interlocks of Fich and White (2005). They found that board overlap decreased from 1980 to 1995 and that the overlapping was larger for the largest firms (interlocking with other large firms) than it was for the smallest firms. They also estimated two measures of interlocks: the average number of seats held by the chairman of the board and the average number of seats held by the other directors. These two metrics were almost constant, the first being about 2.1 seats and the second 1.2 seats. Their empirical exercise tested how interlocks by the chairman of the board and other (non-chairman) directors related to Tobin's *Q*. Results controlling for industry and year dummies showed that number of seats held by the chairman of the board in listed companies affected the firm's good governance. Their insights are that board chairmen "have better certification abilities, more experience in running larger firms, better monitoring skills, or simply more useful contacts in the business community" (p. 186). However, their results also showed that when both the chairman and other directors hold seats on boards of non-listed companies, firm performance was impaired, which can possibly mean that busy boards do not perform their monitoring task.[4]

Miwa and Ramseyer (2005) cast doubt on the perception that Japanese firms with more outside directors outperform those that appoint inside directors, and they suggested that this finding could be extended to firms listed in other equity markets. Corporate governance reformers in both the United States and Japan urge firms to appoint more outside board members, and in the United States there is a credible threat of litigation from shareholders when a listed firm does not appoint enough outside directors. In Japan, however, director appointments are free of the threat of litigation. This difference yields two types of results. First, the appointment of outside directors is not random. In particular, Japanese corporations choose independent directors according to their capital structure constraints. For instance, highly leveraged firms appoint more bankers, and construction firms tend to appoint former technocrats. Second, there is no robust correlation between firm value and board structure, a result supported by the first generation of studies done for the United States. Second, most directors of Japanese firms are insiders. If board structure is driven by market competition, then it is optimal to appoint insiders when knowledge specific to the firm and the core business matters most.

For Latin America there are only a few published studies on boards of directors in general and on directorate interlocks in particular. For the latter, one can highlight the study of Santiago-Castro, Brown and Baéz-Díaz (2009). They present a measurement of board interlocking for a sample of 134 Latin American firms that are cross-listed by issuing American Depositary Receipts (ADRs). Their measurements show that two out of ten corporate directors are interlocked within the companies' sample.[5] The study of Santos, Micheli, and De-Barros (2009) investigates board interlocking across 320 Brazilian listed firms. Their main finding results are that interlocking is a common practice across corporations especially within widely held firms, and busy boards have a negative impact on firm valuation.

This study takes into account at least two additional dimensions of the entrepreneurial structures commonly found in Latin America, which are business group affiliation and family involvement within a sample of both listed and unlisted firms in order to evaluate the effects of board independence and interlocking on firm performance. Gutiérrez, Pombo and Toborda (2008) report that the for the largest business groups in the country one find a mixed ownership structures from pure cross-share holding to pyramidal ownership structures, where the mean of equity rights is around 65 percent in hands of the top four largest blockholders.

The above summarized evidence shows that board interlocks are common across publicly held corporations. Thus, one can expect that board interlocks respond to the monitoring needs of the controlling shareholder, especially in firms affiliated with business groups. Inside directors, in particular those appointed by the controlling shareholder, are important and can play a strategic role in keeping corporate policies aligned to the overall investment policies and ownership structures across business groups, especially within the Colombian context where family involvement still active on boards,

[4] Other related papers on board interlocking for OEDC countries are in Yeo, Pochet and Alcoufee (2003) for France and Kiel and Nicholson (2006) for Australia.

[5] The sample distribution is formed by 39 Brazilian firms, 24 Chilean companies and 71 Mexican firms.

on management, or through blockholder activism. The following working hypotheses constitute the central research questions in this study:

Hypothesis 1. The higher the ratio of outside directors in a sample dominated by affiliated and privately held companies, the better is firm return on assets.

Hypothesis 2. The more a board interlocks across affiliated firms to a given business group and active firm family involvement, the higher the firm performance.

The next section turns attention to the database, variables and method that support the testing of the study's working hypotheses.[6]

3. Data, variables and method

3.1. The database

Two important characteristics of Latin American countries in general and the Colombian economy in particular are the presence of business groups and the small number of listed firms. With this in mind, we hand-collected information and assembled a unique and comprehensive database with micro-data for non-listed and listed firms that have the following characteristics: (1) most are affiliated firms with business groups, (2) the selected seven business groups are ranked within the largest top ten conglomerates in Colombia (and five are still family-controlled), (3) the included business groups are formed mostly by firms belonging to the real sector, (4) the firms included per business group represent at least 80 percent of the group's total number of firms held, and (5) the dataset includes the population of real sector corporations that are not subject to special regulation and that are security issuers whose stocks or bonds were traded at the Colombian stock exchange between 1996 and 2006. Thus, the sample excludes financial institutions, utilities and health care providers. The sample of independent companies is formed mainly by subsidiaries of multinational enterprises well established in the country.

The database span covers the 1996–2006 period and features an average of 335 firms per year, of which 244 are privately held and 52 are independent companies. Overall dataset length is an unbalanced panel of 3694 firm–year observations. The assembled dataset includes three types of indicators. The first are 39 board-related variables that measure directorates' structure, directors and executive interlocking, director independence, turnover rates, boards' demographic and such idiosyncratic characteristics as board size, gender structure and the fraction of foreign members. The second set of 43 indicators, are firm ownership and control variables. They measure investors' cash flow and voting rights, separation between ownership and control, blockholders' contestability and the probabilities of coalitional majorities within boards assembled by the largest equity holder. Firms' financial and idiosyncratic indicators complete the dataset. There are 38 of these variables. All of these characteristics make this dataset unique for a country case study in Latin America as well as for any other emerging economy where empirical corporate governance studies are based mainly on the information listed by companies at the stock exchange.

Information about firms' financial and real variables comes from several sources. The most important ones are the National Equity-Issuer Registry Forms (*Registro Nacional de Emisores de Valores*) filed by Colombia's Financial Superintendence (SFIN) for listed firms and the Superintendence for Commercial Societies (SSOC), which keeps the financial records of around 9000 privately owned medium and large non-listed enterprises in Colombia. These records are supplemented by the notes to financial statements that include 16 annexes per company. These list large shareholders, appointments to the board, the names of top management, the auditing firms, parent–subsidiary commercial relations, external financing sources, direct investment portfolios, the number of employees by occupational category and transactions with providers, among many other kinds of information. Additional company

[6] We do not present because of paper's scope a review of the recent theoretical research on board structure and independent directors. There are related models that *indirectly* support the working hypothesis linking board interlocks and ex post firm performance. See for instance, Wagner (2011).

information came from (1) the Colombian Confederation of Chambers of Commerce (*Confecámaras*), which records and manages the Unique Business Register, a source of current and historical information on companies' CEOs, board members of all limited liability firms and founding partners, (2) the Colombian Stock Exchange (*Bolsa de Valores de Colombia*), and (3) BPR-benchmark (traded as ISI-Emerging Markets), which is financial dataset specialized in Colombian corporations. Firms' ownership data was borrowed and updated from Gutiérrez and Pombo (2009a) study, whose raw data was in turn taken from the SSOC and SFIN.[7]

Tables 1 and 2 show the working sample from 1996 to 2006, broken into business group affiliation and including the sample of independent firms and those of security issuer status. The working sample has several characteristics worth highlighting. First, firms affiliated with the three largest business groups in the country represent, on average, 62 percent of the companies in the working sample. These conglomerates are the *Grupo Empresarial Antioqueño* (GEA), the *Santo Domingo* and the *Ardila-Lulle* groups.[8] Second, firm age distribution shows that most of the companies are incumbents and well-established in the market. Firms' age mean (median) is 31 (27) years. Moreover, 70 out of 298 companies were more than 50 years old in 2006, and five are more than a hundred years old. These companies have been icons of Colombian industrialization since the late 19th century.[9]

Incumbent firms, within business groups, usually have low turnover of directors and executives, with long-standing boards and CEOs. Non-listed companies represent 72 percent of the total study sample. This is an important fact since controlling shareholders are usually found behind privately held companies. Measurements of ultimate owners for Colombian listed firms (Gutiérrez et al., 2008) show that controlling blockholders are behind investment firms and trust funds. Yet, despite the delisting trend observed since the 1990s in most of Latin America's capital markets, and Colombia was not an exception, the listed firms in the working sample remained a constant average of 90 firms from 1996 forward. Thus, the sample coverage of security issuers was 47 percent in 1996 but 73 percent of listed firms in 2006 (see Table 2).

3.2. The measurement of outside directors

A key element for our analysis is the measurement of outside directors, a difficult category to isolate since it was not mandatory to disclose such information before Colombia's Law 964 of 2005. Thus, our identification of a director as an outsider relied on crossing different criteria stipulated by the Colombian corporate law, international legislation, studies in the field (i.e., Dahya, Dimitrov, & McConnell, 2008), and the criteria followed by multilateral institutions. In particular, an outsider director is a person who (1) has never had employment with the firm other than being on the board of directors, (2) was never employed with any related firm as far as the scope of the sample allows us to tell, (3) does not sit on any of the boards of related firms as far as the scope of the sample allows us to tell, (4) does not have family ties with controlling shareholders or the CEO, and (5) is not a shareholder with ownership rights greater than 10 percent, which is the threshold for a blockholder as usually defined in studies of corporate control. Thus, we exclude to the extent possible, gray directors who are not company executives but who are affiliated with the firm and its conglomerate to some degree. However, our approach does not distinguish between an outsider and independent director

[7] SSOC companies' financial statements are public online, and the complete records are available on request. The notes to financial statements and appendices are subject to statistical reserve.

[8] For more details on the ownership structure and brief history these three conglomerates is in Gutiérrez et al. (2008).

[9] The centennial companies in the database are: the brewer Bavaria S.A., founded in 1889; the soft drink company Postobon S.A. (Gaseosas Posada y Tobon) founded in 1909; the retail dealer chain Carulla S.A., founded in 1905; the life insurance company Colseguros S.A. (Compañía Colombiana de Inversiones y Seguros) from 1874; and the printing and publisher holding Carvajal S.A. founded in 1904. For more details on Colombian business history, see Davila (2002).

Table 1
Number of firms and age distribution statistics by business group.

Group Name	Stat.	Year						Group Name	Stat.	Year					
		1996	1998	2000	2002	2004	2006			1996	1998	2000	2002	2004	2006
Ardila-Lule	*n*	61	64	65	63	58	55	GEA	*n*	91	96	98	93	88	75
	Mean	30	31	32	34	36	39		Mean	28	28	28	29	31	33
	p50	27	28	30	32	33.5	36		p50	19	20	21	22	25	27
	max	92	94	96	98	100	102		max	89	91	84	86	88	87
Carvajal	*n*	32	33	37	38	36	34	Sanford	*n*	6	6	6	6	6	6
	Mean	21	22	22	23	26	29		Mean	22	24	26	28	30	32
	p50	16	17	18	19	22	25		p50	20	22	24	26	28	30
	max	92	94	96	98	100	102		max	40	42	44	46	48	50
Colombina	*n*	14	18	17	17	16	16	Santo-Domingo	*n*	55	59	57	56	50	46
	Mean	26	22	24	26	28	28		Mean	27	26	29	31	30	33
	p50	20	21	23	25	22	17		p50	17	18	20	22	22	26
	max	65	67	69	71	73	75		max	122	124	126	128	130	132
Corona	*n*	22	22	17	16	16	15	Non-affiliated	*n*	52	52	53	53	51	51
	Mean	29	31	31	35	37	40		Mean	35	37	39	41	43	45
	p50	33	35	36	39	41	43		p50	36	38	40	42	44	46
	max	65	67	69	71	73	75		max	91	93	95	97	99	101
								Total firms	*n*	333	350	350	342	321	298

Sources: Data assembled from financial statements, boards, top directives and shareholder records for listed firms at the SFIN and for non-listed firms at the SSOC, Chamber of Commerce firms' registries and companies' reports.

Notes: p50, 50th percentile; max, maximum value. The GEA group (*Grupo Empresarial Antioqueño*) follows a cross-share holding structure. Its main core businesses are in the cement industry, processed food and insurance services. One of its leading companies is *Cementos ARGOS*. The *Santo Domingo* group is a conglomerate formerly led by *Bavaria S.A.*, the largest brewery in Colombia which merged with SAB-Miller in 2005. The group now manages a portfolio, led by the investment firm Valorem S.A., in several industries, some of them considered as non-core business before 2005. This group follows a pyramidal structure with some cross-shares. The *Santo Domingo* family is still the controlling shareholder of Valorem S.A. and their related companies through the investment fund Invernac S.C.A., which is a closed fund with the family holding around 32 percent of equity share in 2006. The *Ardila-Lulle* group is formed mainly by non-listed companies. It is a family conglomerate and follows a pyramidal holding structure. Its core businesses are the beverages and soft drinks industries. The *Carvajal* group is a family conglomerate with core businesses in the printing and publishing industry. All their companies are privately held firms. The *Colombina* group's core businesses are sugar refineries and manufactures of sugar products. The group has three listed companies currently. The *Caicedo* family is still the controlling blockholder. The Corona group is a leader in the manufacture of porcelain and home ceramic products. It is a pyramidal group and former conglomerate of the *Echavarria* family. Today the group has an important share of the Chilean *Sodimac* and *Fallabella* holdings. The Sanford group's core business is in the petro-chemical sector. This group has a high level of equity shares held by foreign investors.

Table 2
Number of firms by security issuer status.

	1996	1998	2000	2002	2004	2006
Panel A: Security issuer status						
Privately held firms	244	255	255	249	231	215
Publicly held firms	89	95	95	93	90	83
Panel B: Number of listed firms at the Colombian stock exchange						
Number of firms	189	163	126	114	114	114
Sample coverage	0.47	0.58	0.75	0.82	0.79	0.73

Sources: Data assembled from financial statements, boards, top directives and shareholder records for listed firms at the SFIN and for non-listed firms at the SSOC (super-sociedades), Chamber of Commerce firms' registries, and companies' reports; total Listed firms in Colombia (World Bank-WDI-2009) include real sector companies and commercial banks.
Notes: GEA, *Grupo Empresarial Antioqueño*, p50, 50th percentile; max, maximum value; country's listed firms include real sector firms, banks and commercial financing companies.

because we do not know whether an outside director was elected by blockholder votes or was a former employee of a related company.[10]

Table 3 displays the core results concerning the outside director ratio-statistics. These measures reflect at least three main facts. First, the fraction of outside directors is lower within pyramidal and family controlled groups with low or null listing rates. This is clear from the statistics of *Carvajal*, *Colombina* and *Corona* groups. Non-family groups such as Sanford, that has a high degree of direct foreign investment report ratios similar to that of the independent firms. The case of GEA is interesting. This non-family group reports outside director ratios similar to that of the Santo-Domingo group, which has dominant family blockholders. Thus, in the case of GEA, inside directors carry important weight across the group's directorate structure because of their reciprocal ownership relations across companies. Second, security-issuers display greater outside director ratios regardless of their affiliation status, which is the expected result since they are exposed to corporate governance norms requested by the stock exchange and institutional investors. Third the evolution of the outside director ratio exhibits two trends. One is that independence exhibits a decreasing pattern within affiliated firms in contrast to the independent ones. One explanation of such result is the holding restructuring trough mergers and acquisitions that took place since year 2000 as consequence of the country's 1999 financial crisis, the entry of foreign competitors and the search of strategic foreign investors to enhance firms' competitiveness and technical change. In fact, according to official records at SSOC there were 184 large mergers in year 2000 while the average number during the 1995–1998 period was around 20 larger mergers per year. The result of this process increased ownership concentration of the largest blockholder (Gutiérrez & Pombo, 2009a) and might had impact on companies' board structure. The second observed pattern is that board independence increases within publicly held firms. This is a result of the comply or explain principle followed by SFIN since 2002 for all listed firms whose securities are demanded by pension funds. The test for difference in means of the outside director ratio by affiliation and security issuer status is displayed in Panels B and C of Table 3. For both cases differences are statistically significant at the 1 percent level.

The aggregate ratio of outside directors in our sample is 33.7. This is consistent with what has been reported in other studies, particularly those done for Latin America. In general, one expects companies in mature markets to appoint more outside directors than firms in emerging markets because of their better governance standards. The numbers displayed in Table 4, which summarize measurements of outside director reported by six recent studies, suggest this pattern. The most comprehensive study of Dahya et al. (2008), looks at 799 firms in 22 countries with a dominant shareholder and investigates the

[10] Overcoming the potential over-estimation problem is constrained since we have only limited information about companies' top executives. In most cases the information is limited to the names of the CEOs, CFOs, and the director of human resources. Also, the definition of independent directors varies in Latin America according to corporate law legislation. For instance, in Chile an independent director is defined as one appointed without controlling shareholder votes. Colombia's security law (Law 964) considers an independent board member as one who is not a company employee or a director or executive in a subsidiary/parent or affiliated company in a business group, not a partner of consulting firms with commercial transactions with the company or an executive of a non-profit organization that is supported directly by the company.

Table 3
Outside director ratio statistics.

Conglomerate		1996	1998	2000	2002	2004	2006
Panel A: Fraction of outside directors by business group							
Ardila-Lule	*n*	61	64	65	63	58	55
	Mean	0.24	0.26	0.27	0.26	0.25	0.23
	p50	0.17	0.23	0.17	0.17	0.17	0.17
Carvajal	*n*	32	33	37	38	36	34
	Mean	0.18	0.18	0.16	0.17	0.21	0.21
	p50	0.00	0.00	0.00	0.15	0.17	0.13
Colombina	*n*	14	18	17	17	16	16
	Mean	0.09	0.07	0.06	0.06	0.08	0.08
	p50	0.00	0.00	0.00	0.00	0.00	0.00
Corona	*n*	22	22	17	16	16	15
	Mean	0.25	0.23	0.26	0.19	0.19	0.14
	p50	0.27	0.17	0.25	0.17	0.14	0.13
GEA	*n*	91	96	98	93	88	75
	Mean	0.39	0.34	0.32	0.33	0.33	0.37
	p50	0.33	0.33	0.33	0.33	0.33	0.33
Sanford	*n*	6	6	6	6	6	6
	Mean	0.75	0.56	0.60	0.64	0.40	0.51
	p50	0.75	0.65	0.67	0.67	0.44	0.55
Santo-Domingo	*n*	56	60	58	57	50	46
	Mean	0.35	0.36	0.33	0.31	0.33	0.38
	p50	0.33	0.33	0.30	0.33	0.33	0.33
Panel B: Fraction of outside directors by affiliation status							
Non-affiliated [0]	*n*	52	52	53	53	51	51
	Mean	0.63	0.60	0.79	0.60	0.60	0.74
	p50	0.67	0.67	0.83	0.60	0.60	0.80
Affiliated [1]	*n*	282	299	298	290	270	247
	Mean	0.31	0.29	0.28	0.27	0.27	0.29
	p50	0.33	0.30	0.17	0.20	0.20	0.20
Panel C: T-statistic for differences in means							
T-test Non Affiliated vs Affiliated firms				29.47			
				[0.00]			
Panel D: Fraction of outside directors by security issuer status							
Privately held [0]	*n*	245	256	255	249	231	215
	Mean	0.31	0.30	0.30	0.27	0.28	0.31
	p50	0.33	0.30	0.17	0.20	0.20	0.29
Publicly held [1]	*n*	89	95	96	94	90	83
	Mean	0.49	0.44	0.49	0.45	0.42	0.51
	p50	0.50	0.40	0.50	0.50	0.42	0.60
Panel E: T-statistic for differences in means							
T-Test Privately vs Publicly held firms				−16.40			
				[0.00]			

Sources: Data assembled from financial statements, boards, top-directives and shareholder records for listed firms at the SFIN and for non-listed firms at the SSOC (super-sociedades), Chamber of Commerce firms' registries, and companies' reports. *p*-values in brackets.

Notes: GEA, *Grupo Empresarial Antioqueño*; p50, 50th percentile; max, maximum value; min, minimum value; *T*-test on Ho = mean (group 0) − mean (group 1) = 0.

relation between corporate value and independent directors. The reported measurements for outside directors indicate that the two largest equity markets in the region exhibit the highest ratios, above 54 percent. For the remaining cases, the measurements indicate similar or lower ratios.

It is important to highlight the measurement of independent directors in Brazil, Chile, and Venezuela, where disclosure of a director's status is mandatory for all equity issuers. Brazil was a

Table 4
Outside director ratio by selected countries.

Country	Mean independ/outside directors	Study	Period
Australia	64.6%	Kang et al. (2007)	2003
Canada[a]	68.0%	Park and Shin (2004)	1991–1997
Denmark	44.2%	Dahya et al. (2008)	2002
Finland	66.3%	Dahya et al. (2008)	2002
France	57.4%	Dahya et al. (2008)	2002
Germany	57.5%	Dahya et al. (2008)	2002
United States	60.1%	Barnhart, Marr, and Rosentein (1994)	1991
United States	75.0%	Dahya et al. (2008)	2002
India	45.8%	Berkman, Cole, Lee, and Veeraraghavan (2003)	2001–2003
Malaysia	47.5%	Dahya et al. (2008)	2002
Brazil	57.1%	Dahya et al. (2008)	2002
Chile	34.0%	Lefort and Urzua (2007)	2000–2003
Mexico	54.1%	Dahya et al. (2008)	2002
Venezuela	54.0%	Garay and González (2007)	2002
Colombia[a]	33.7%		1996–2006

Sources: Data assembled from financial statements, boards, top directives and shareholder records for listed firms at the SFIN and for non-listed firms at the SSOC (super-sociedades), Chamber of Commerce firms' registries, and companies' reports.
[a] Refers to outside director ratio.

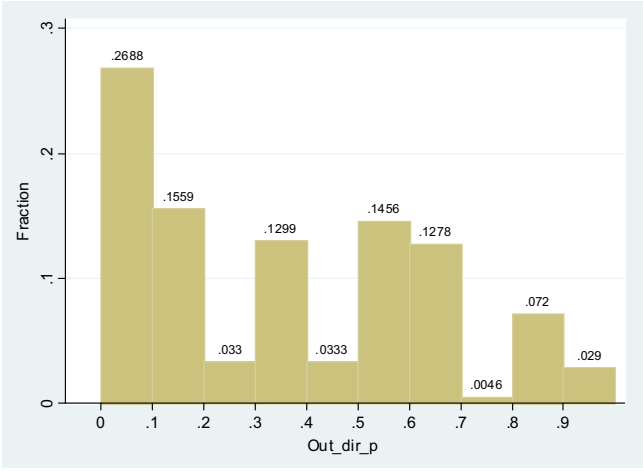

Fig. 1. Outside director ratio histogram. This figure plots the histogram of the ratio of outside directors to total directorate members. The figure shows that in 40 percent of the firm-year observations, outside directors represent up to 20 percent of the board seats. However, around 25 percent of outsiders in the total sample constitute between 50 and 70 percent of firms' boards. The rest of the observations are non-uniformly distributed across bins.
Sources: Our own estimations based on an expanded dataset from SFIN and the SSOC official records, Chamber of Commerce firms' registries, and companies' reports on firms' boards and top directives.

pioneer in this self-regulation through the launching of the Novo Mercado at the Sao Pablo stock exchange in 2000. The closest numbers to the Colombian ratios are those reported for Chile (Lefort and Urzua, 2007), where the fraction of outside directors is around 34 percent for the largest companies (5th quintile) and where ownership is less concentrated. The distribution of board structure for the whole panel dataset indicates that in around 40 percent of the firm-year observations the outside director ratio is lower than or equal to 20 percent and family-controlled groups tend to have much lower ratios (see Figs. 1 and 2). This result is also consistent with results from Chile. In that sample the ratio of outside directors ranges from 17 to 25 percent for the most concentrated firms. Hence, we are confident that our measures of outside director ratios are robust and in accordance with findings in other emerging markets.

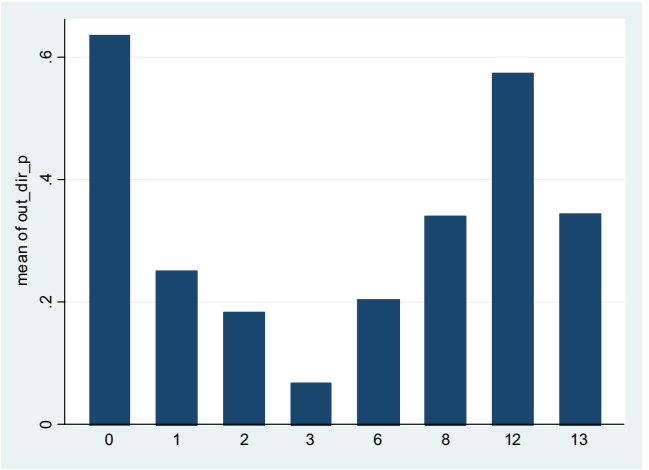

Fig. 2. Mean of outside director ratio frequency by business group. This figure plots the mean of outside director ratio frequency by business group. The figure shows that independent firms exhibit higher rates of outside director ratio, with an average of 60 percent in the firm-year observations. Affiliated firms show outside director ratios below 35 percent, excepting the Sanford group, which exhibits a board structure similar to that of non-affiliated firms. This group is formed by six corporations specializing in the manufacture of petrochemical products and has a high participation of foreign investment. *Notes*: Conglomerates names and numbers are: Non-Affiliated (0), Ardila Lulle (1), Carvajal (2), Colombina (3), Corona (6), GEA (8), Sanford (12), Santo-Domingo (13).
Sources: Our own estimations based on an expanded dataset from SFIN and the SSOC official records, Chamber of Commerce firms' registries, and companies' reports on firms' boards and top directives.

3.3. Board interlocking indicators

The measure of board interlocks constitutes a core objective of this study. Directorate interlocking is an organizational fact not yet analyzed for the Colombian case. Board interlocking has direct implications for firms' governance, investment quality and capital structure. Interlock indicators describe the crossing relations that a given director has simultaneously with other firms. In that sense, we measure four types of interlocking variables. The first are pure interlocks within and outside the business group relative to board size. This variable counts the number of external seats held by all single directors and so provides an average number of directorships per director in a given firm.

The second type of indicator is related to the concept of busy directors. A busy director is measured by a dummy variable equal to 1 if any board member holds two or more seats. We further distinguish between busy directors who are either insiders or outsiders. The former might be represented by top executives who are knowledgeable about the business and group interactions. The latter are reputable individuals, usually former government technocrats or retired executives from financial institutions – in general well-known corporate executives and entrepreneurs.

A third type of indicator is the reciprocal CEO interlock, meaning the CEO of firm *i* sits on the board of other companies whose CEO is reciprocally seated at the same time on firm *i*'s board. This particular relation is common in cross-share holdings and is apparent inside the GEA conglomerate in Colombia. The fourth and last interlocking indicator tries to capture family relations of board members by determining whether a director has the same last name as the group's founding family and descendants. These directors basically are appointed by the controlling shareholder, especially within the family business groups.

Table 5 displays the results of the board interlocking indicators. Three patterns can be observed. First, director interlocking occurs mostly in companies within business groups. The mean of the number of external seats to board size ratio is 1.3. The histogram of inside director interlocking (Fig. 3) indicates that insiders on a given firm's board have up to ten external seats in other holding companies in 65 percent of the firm-year-observations. Director interlocking outside the business group is 10

Table 5
Board interlock indicators by year (means and number of firms).

Variable/indicator	1996	1998	2000	2002	2004	2006
Number of firms	334	351	351	343	321	298
Interlocks within BG/board size	1.19	1.36	1.41	1.40	1.24	1.02
Interlocks outside BG/board size	0.08	0.08	0.12	0.10	0.11	0.11
Best director reputation	3.24	3.54	3.67	3.53	3.11	2.62
Number of busy directors	2.28	2.51	2.66	2.64	2.43	2.18
Busy directors insiders	2.16	2.42	2.54	2.55	2.31	2.08
Busy directors outsiders	0.11	0.09	0.11	0.10	0.12	0.10
Reciprocal CEO Interlocks	0.35	0.35	0.37	0.24	0.29	0.26
Family members/Board size	0.22	0.23	0.22	0.20	0.21	0.22

Sources: Our estimates based on financial statements, boards, top directives and shareholder records for listed firms at the SFIN and for non-listed firms at the SSOC (super-sociedades), Chamber of Commerce firms' registries, and companies' reports.
Notes: Complete variables definitions are in Appendix A. BG, business group.

percent; that is, less than one external seat per board. The maximum number of external seats that a single individual has in a given directorate captures director's reputation at some degree. The median of this variable is 3 seats with a maximum of 12 seats. That is the most well connected director is expected to have appointments in three firms. Second, 95 percent of busy directors are insiders, holding 2.3 seats on average. Third, reciprocal CEO interlocking is observed in 30 percent of the sample; they remain family-related in around 20 firms. Thus director interlocking within affiliated firms is a fact that shapes board structure and influences its controlling role.

A question that arises at this point concerns the basic firm governance patterns that can be observed in the metrics related to board structure and the indicators for interlocking and outside directors. One might expect boards in non-family business groups, independent firms or publicly held corporations to exhibit more independent structures because they are less equity-concentrated. Also, securities issuers are exposed to capital markets and security exchange regulation and so are obliged to fulfill information disclosure standards and to adopt corporate governance codes voluntarily.

Table 6 (Panel A) displays the fraction of firms with a CEO who is also a board member, as either principal or substitute. Panel B shows the average of directors who are at the same time CEOs in other

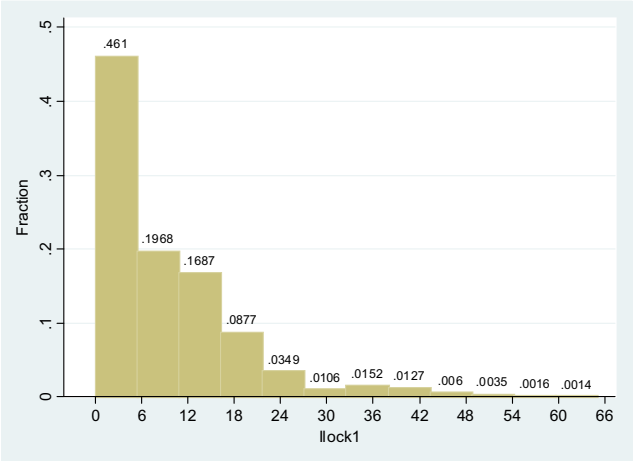

Fig. 3. Board interlocks within business groups. This figure plots the histogram of director interlocks, which is equal to the total number of external directorships held by a board member within firms affiliated to the conglomerate. Measurements are restricted only to firms in the sample. The histogram shows that in 65 percent of the firm–year observations, insider members have up to 10 external seats within holding companies.
Sources: Our own estimations based on an expanded dataset from SFIN and the official records, Chamber of Commerce firms' registries, and companies' reports on firms' boards and top directives.

Table 6
Governance independence indicators.

Conglomerate	Year										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Panel A: Number and Fraction of firms where CEO is a board member by business group											
Ardila-Lule	61	63	64	64	65	64	63	63	58	58	55
	0.43	0.46	0.36	0.30	0.29	0.31	0.29	0.30	0.26	0.29	0.27
Carvajal	32	32	33	36	37	38	38	37	36	34	34
	0.72	0.72	0.70	0.64	0.54	0.50	0.42	0.43	0.39	0.35	0.38
Colombina	14	16	18	18	17	17	17	17	16	16	16
	0.07	0.19	0.17	0.11	0.24	0.35	0.29	0.29	0.38	0.31	0.25
Corona	22	22	22	22	17	16	16	16	16	16	15
	0.18	0.27	0.32	0.27	0.29	0.25	0.25	0.31	0.25	0.25	0.67
GEA	91	95	96	97	98	95	93	91	88	81	75
	0.23	0.24	0.25	0.23	0.18	0.19	0.18	0.18	0.20	0.16	0.17
Sanford	6	6	6	6	6	6	6	6	6	6	6
	0	0	0	0	0	0	0	0	0	0	0.17
Santo-Domingo	56	60	60	60	58	58	57	53	50	49	46
	0.11	0.15	0.13	0.12	0.17	0.19	0.16	0.23	0.30	0.35	0.39
Non-affiliated	52	52	52	53	53	53	53	53	51	51	51
	0.48	0.50	0.48	0.47	0.43	0.47	0.51	0.49	0.41	0.45	0.45
Panel B: Number of firms and Average CEO directors-duality within business groups											
Ardila-Lule	61	63	64	64	65	64	63	63	58	58	55
	1.23	1.13	1.13	1.03	1.00	1.02	1.17	1.13	1.19	1.26	1.24
Carvajal	32	32	33	36	37	38	38	37	36	34	34
	1.34	1.47	1.48	1.25	1.22	1.18	1.16	1.16	1.08	1.12	1.15
Colombina	14	16	18	18	17	17	17	17	16	16	16
	0.79	0.69	0.72	0.72	0.76	1.47	1.24	1.24	1.31	1.06	0.94
Corona	22	22	22	22	17	16	16	16	16	16	15
	1.27	1.36	1.23	1.50	0.71	1.06	1.25	1.19	0.75	1.13	1.13
GEA	91	95	96	97	98	95	93	91	88	81	75
	0.92	0.99	1.03	1.03	1.19	1.21	1.20	1.19	1.17	0.89	0.73
Sanford	6	6	6	6	6	6	6	6	6	6	6
	0.17	0.00	0.00	0.00	0.00	0.00	0.17	0.33	0.33	0.50	0.50
Santo-Domingo	56	60	60	60	58	58	57	53	50	49	46
	1.20	1.33	1.28	1.08	0.93	0.78	0.68	0.74	0.68	0.45	0.65
Non-affiliated[a]	52	52	52	53	53	53	53	53	51	51	51
	0.13	0.17	0.13	0.17	0.15	0.11	0.17	0.15	0.08	0.06	0.10

Sources: Data assembled from financial statements, boards, top directives and shareholder records for listed firms at the SFIN and for non-listed firms at the SSOC (super-sociedades), Chamber of Commerce firms' registries, and companies' reports.

Notes: CEO-director duality refers to the number of directors who are CEOs of other firms in the same business group. Measures are restricted to firms within the sample.

[a] For independent firms the indicator takes into account only the number of directors who are CEOs of other firms.

firms in the same conglomerate. The main observation is that there is no obvious taxonomy regarding corporate best practice levels across groups. For instance, the family-controlled groups, such as *Ardila-Lulle* or *Carvajal*, reduced their CEO appointments to their boards by 40 percent during the ten-year period of study. The former holding has four listed firms and the latter never has had a publicly listed company. In contrast, groups with a large number of security issuers have improved the trend toward avoiding CEO-director duality status. The cross-shares holding GEA, which has the largest number of listed firms in Colombia, had reduced dual appointments by 25 percent by 2006, and there is an evident reversal within the *Santo Domingo* and *Corona* groups, which follow GEA in the number of listed firms. Independent firms in our sample exhibit the worst rates in this indicator, mainly because an important fraction of the non-listed companies are subsidiaries of multinationals.

These findings are important to contrast with what has been reported regarding corporate governance standards in association with the long-term trends of Colombia's capital market development and financial regulation (Gutiérrez & Pombo, 2009b). Aggregate measures of corporate governance indices from surveys across security issuers have shown positive changes in the core principles concerning conflict resolution, information disclosure, board independence, auditing committees and shareholders' general assembly requirements during the last ten years. One instrument that improved corporate best practices was Resolution 271/2001 from the former Superintendence of Securities. This made adoption of corporate governance codes mandatory for all companies whose securities were to be acquired by pension funds. A total of 108 security issuers out of 160 had issued corporate best practice codes by 2008 according to SFIN. A central element of such codes is explicit separation between the roles of CEO and chairman of the board. Thus, the poor results reported for some business groups in Table 6 demonstrate that looking at corporate governance trends in a sample of listed firms that adopted codes is not enough to describe corporate governance implementation within conglomerates.

CEO interlocking within business groups also has no specific pattern. For some groups, the average number of directors who are CEOs at other holding companies decreases during the time period, as is the case of the Santo Domingo group. But in other cases, like the Ardila group, this indicator remains fairly constant. The overall mean of this indicator for the affiliated firms is close to 1, meaning that each company board has at least one seat belonging to another holding firm's CEO. These members are by definition professional directors and insiders from a conglomerate's view. They are valued for their knowledge specific to the group's core businesses, the holding's financial portfolio and cross-firm financial relations. The interpretation of this indicator is mixed from the standpoint of corporate governance. On one hand CEO interlocks decrease directorate independence by favoring cash flow diversion (tunneling). On the other hand, they can control a firm's investment quality by acting to steward the holding's overall value and blockholders' wealth. Control contestability behavior is expected among large shareholders (Maury & Pajuste, 2005).

3.4. Performance, independent and control variables

The econometric analysis relies on the micro-determinants of firm performance as a function of the ratio of outside directors and board interlocking relations. Firm performance relies on accounting measures such as (1) the return on assets ratio (ROA) defined as net income after taxes over book value of assets and (2) the return to equity ratio (ROE) defined as earnings before interest, tax, depreciation and amortization divided by book value of shareholder equity. Most of the recent empirical literature concerning board independence and ex post firm performance focus on the relation between outside directors and firm value measured by Tobin's *Q* because the data sample includes only publicly held firms, including those from recent privatizations in emerging economies or economies in transition.[11] To a great extent, this study focuses on non-listed firms affiliated either with a given family or non-family groups. Thus, firm performance has to rely on the above-mentioned accounting measures. The empirical design focuses on firms' ROA, but we include ROE regressions for robustness checks despite the limitation of this indicator, which is heavily dependent on firm capital structure and therefore

[11] See for instance, among others, the papers of Black, Hasung, and Kim (2006) and Black and Kim (2010) for Korea, Dahya et al. (2008) for a cross country panel of 22 countries, and Erickson, Park, Reising and Shin, (2005) for the case of Canada.

provides less informational content on the firm's true investment opportunity set (Adam & Goyal, 2008).

The econometric specification follows a general one-way error component, where individual effects might be fixed or random that captures the model unobservable characteristics. Regression equations are controlled by board structure, directorate demographics, ownership structure, financial indicators and firm idiosyncratic variables that define the following estimating equation

$$Y_{it} = \alpha_0 + \alpha_k \mathbf{BS}_{it} + \beta_k \mathbf{BD} + \delta_k \mathbf{OC}_{it} + \varphi_k \mathbf{X}_{it} + IND_j + (\alpha_i + \varepsilon_{it}) \quad (1)$$

The performance variable Y_{it} is either the ROA or ROE ratio. These variables were corrected by deleting extreme outliers equal to those observations greater than three standard deviations.[12] **BS** is the vector of board structure variables: the outside director ratios and board interlocking indicators explained in Section 4. These are the model's independent variables. Control variables are divided into three sets of indicators. The vector **BD** denotes the directorate's demographic and related variables such as board gender composition, the fraction of foreign members, board size and directors' turnover. The **OC** vector covers blockholder ownership and control contestability indicators. Equity concentration is measured by means of concentration ratios defined as the largest blockholder's weight on firm equity (CR1), the sum of the top two blockholders (CR2) and so on. Separation ratios (SRs) measure shareholder equity-to-voting rights and capture the wedge between blockholders' ownership and control. The expected sign is negative since greater separation leads to rent diversion and tunneling. The measurement of a blockholder's voting rights relied on the measurement of integrated ownership that any investor within a business group might have through a personal investment portfolio across companies that are equity-related. Firms' integrated ownership follows the input–output matrix approach of the Barca and Becht (2001) study on corporate control in Europe.[13]

Control contestability variables were constructed by following Maury and Pajuste (2005), Jara-Bertin, López-Iturriaga, and López-de-Foronda (2008) and Gutiérrez and Pombo (2009a). The first variable is the Herfindal concentration index that captures the effect of voting block power. A second variable is the differences in the Herfindal indices, defined as the sum of the squares of the differences between the first and second largest voting stakes, the second and the third largest voting stakes and the third and fourth largest voting stakes. These variables capture the actual contestability facing the largest blockholder when the company cannot be controlled directly. Their expected relation with firm profitability is negative because, as voting power among the four largest shareholders becomes more egalitarian, there is more control contestability and so greater firm value.

A third contestability variable is the *Shapley value*, which is the solution concept for coalitional games. In this case, it will measure the probability that individual blockholders (or groups of shareholders) form part of a winning coalition. Thus, if the probability of forming a sustainable coalition with the largest blockholder increases, there is a diversion of cash flows, which therefore lowers firm value and performance. The fourth proxy is an index that measures the equity of the second and third blockholders relative to the largest block. As this index increases, the second and third shareholders might have more influence on the largest shareholder's investment decisions.

The vector **X** includes such financial indicators as firm leverage, capital structure, payout ratios, asset tangibility, and growth opportunities defined as the annual percentage change of either real sales or fixed assets. Three idiosyncratic variables are included: age, firm size (log of assets) and dummies for firm affiliation with a business group and for whether a firm's auditor is an external company or simply an individual accountant. Industry dummies are included to control the estimating Eq. (1). Table 7 summarizes the statistics for these variables by firm-year observations for the unbalanced panel for the 1996–2006 period. Appendix A explains in further detail, all variables' definitions and methodology.

[12] The total number of firm-year observations is 3694 for both ratios ROA and ROE. After deleting extreme outliers, total observations dropped to 3679 and 3688, that is, less that 1 percent of the total sample.

[13] Integrated ownership in those studies is used as proxy for voting rights, which are defined as $\mathbf{V} = (\mathbf{D}(\mathbf{I} - \mathbf{A})^{-1})^{-1}\mathbf{A}(\mathbf{I} - \mathbf{A})^{-1}$, where **A** is the matrix of direct shareholdings of every investor and firms belonging within a business group, **I** is the identity matrix, **D** is the diagonal elements of matrix **A**, and **V** denotes the voting rights matrix. For more details on the derivation of the above formula and the analysis of voting rights across Colombian corporations, see Gutiérrez et al. (2008).

Table 7
Performance and control variables summary of statistics.

Variable	Obs	Mean	Std. dev	Median	Min	Max
Performance[a]						
ROA	3679	3.5E−04	0.14	0.02	−1.75	0.82
ROE	3688	0.12	2.87	0.03	−13.04	68.79
Board interlocks						
Board interocks inside BG	3694	9.00	9.87	6.00	0.00	65.00
Board interocks outside BG	3694	0.77	1.92	0.00	0.00	23.00
Directorate reputation	3694	1.38	1.28	1.10	0.00	7.33
Best director reputation	3694	3.29	2.53	3.00	0.00	12.00
CEO director duality	3694	0.91	1.11	1.00	0.00	7.00
Reciprocal CEO Interlocks	3694	0.30	0.87	0.00	0.00	6.00
Family_CEO	3694	0.15	0.35	0.00	0.00	1.00
Family members-participation	3694	0.22	0.28	0.17	0.00	1.00
Board demographics						
Board_size	3694	7.13	2.00	6.00	1.00	10.00
Female_participation	3694	0.16	0.19	0.10	0.00	1.00
Foreign_paticipation	3694	0.05	0.13	0.00	0.00	0.90
Board_turnover-particpation	3316	0.18	0.25	0.00	−1.00	1.00
Ownership and control contestability						
Equity 1	3686	0.54	0.27	0.49	0.06	1.00
Equity 2	3686	0.19	0.14	0.17	0.00	0.50
Equity 3	3686	0.08	0.08	0.07	0.00	0.33
Equity 4	3686	0.05	0.05	0.03	0.00	0.25
Equity-voting ratio1	3686	0.91	0.18	1.00	0.11	1.00
Equity-voting ratio2	3684	0.73	0.33	0.94	0.00	1.00
Equity-voting ratio3	3590	0.56	0.41	0.56	0.00	1.00
Equity-voting ratio4	3531	0.48	0.43	0.40	0.00	1.00
Herfindal index-concentration[b]	3686	0.44	0.29	0.37	0.01	1.00
Herfindal-index-differences[b]	3686	0.28	0.31	0.12	0.00	1.00
Contestability-index	3686	0.77	0.59	0.79	0.00	2.00
Shapley value[b]	3686	0.71	0.35	1.00	0.05	1.00
Sum_Blocks	3686	3.09	1.15	4.00	0.00	4.00
Firm characteristics						
Firm size (log assets)	3694	17.66	1.94	17.68	11.03	23.13
Asset tangibility	3694	0.25	0.22	0.22	0.00	0.99
Leverage	3694	0.12	0.22	0.04	0.00	7.43
Dividend-payout ratio[a]	3666	0.01	0.02	0.00	0.00	0.18
Growth Opportunities (assets)	3316	−0.02	0.61	−0.02	−11.86	9.80
Audit-firm-dummy	3694	0.49	0.50	0	0	1
Age	3703	31.08	22.72	27	0	132

Sources: Data assembled from financial statements, boards, top directives and shareholder records for listed firms at the SFIN and for non-listed firms at the SSOC (super-sociedades), Chamber of Commerce firms' registries, and companies' reports.

[a] Corrected by deleting outliers equal to those observations greater than three standard errors.

[b] Herfindal indices up to four largest blockholders; Shapley value refers to the solution to a coalitional game of three players (blockholders).

4. Econometric results

4.1. Random-effects regressions

This section presents the estimates of the baseline error component model in Eq. (1), which accounts for a firm's unobservable variables through the regression equation residual or random-effects model. Table 8 summarizes the econometric results for the performance regressions. The regressions' main objective is to evaluate the impact of board variables on firms' ROA while taking into account structural controls like ownership concentration, blockholder contestability, financial indicators and idiosyncratic firm variables. Regression equation (1) is the reference specification for the model's empirical

Table 8
Performance regressions (random-effects).

Dependent variable: Return on Assets (ROA)	Eq. (1)	Eq. (2)	Eq. (3)	Eq. (4)
Outside director ratio	0.024		0.053	0.056
	(0.01)*		(0.022)*	(0.023)*
Family_CEO	−0.020	−0.018	−0.025	−0.028
	(0.009)*	(0.009)**	(0.014)**	(0.016)**
Family members participation	0.029	0.022		0.027
	(0.01)*	(0.01)*		(0.015)**
Directorate reputation	0.009	0.009		
	(0.003)*	(0.003)*		
Best director reputation	−0.004	−0.005		
	(0.002)*	(0.002)*		
Board interlocks outside BG	0.002	0.003		
	(0.001)**	(0.001)**		
Board turnover participation	−0.016	−0.020	−0.018	−0.0177
	(0.008)*	(0.008)*	(0.009)**	(0.009)**
Female participation	−0.051	−0.028	−0.053	−0.058
	(0.013)*	(0.013)*	(0.016)*	(0.016)*
Herfindal_concentration	0.019	0.034		
	(0.012)	(0.013)*		
Concentration ratio (CR3)				0.059
				(0.021)*
Herfindal differences			0.053	
			(0.021)*	
Contestability index			0.020	
				(0.009)*
Shapley value	−0.028	−0.036		−0.021
	(0.010)*	(0.011)*		(0.013)**
Equity-voting ratio 3th blockholder			0.024	0.023
			(0.01)*	(0.01)*
Concentration ratio (CR1) × Outside directors ratio			−0.077	−0.078
			(0.036)*	(0.038)*
Age × Firm size	1.3E−05	1.3E−05		
	(6.7E−0.6)**	(7.0E−06)*		
Firm size (Log Assets)			0.024	0.024
			(0.003)*	(0.003)*
Dividend payout ratio	0.095	0.092		0.140
	(0.037)*	(0.038)*		(0.053)*
Leverage	−0.2008		−0.298	−0.296
	(0.024)*		(0.035)*	(0.035)*
Audit firm dummy			−0.026	−0.021
			(0.007)*	(0.007)*
Business group affiliation dummy			−0.024	
			(0.119)*	
Constant	0.034	0.018	0.390	−0.419
Dummy for residual outliers	Yes	Yes	Yes	No
Regression statistics				
Obs	3288	3288	3204	3203
Number of groups	374	374	368	368
R^2-overall	0.47	0.42	0.18	0.19
Mean VIF (multicollinearity)[a]	2.03	1.96	2.11	1.92
Wald-test	299	116	140	127
	[0.000]	[0.000]	[0.000]	[0.000]
Shapiro–Wilk normality	16.2	16.3	16.3	16.3
	[0.000]	[0.000]	[0.000]	[0.000]
Specification tests for random-effects				
Lagange multiplier test for RE	736	887	1591	1561
	[0.000]	[0.000]	[0.000]	[0.000]
Hausman specification test	15.1	80.8	87.4	82.2
	[0.374]	[0.000]	[0.000]	[0.000]

Notes: Robust White–Hubert standard errors are in parenthesis: **significant at the 10 percent level; *significant at the 5 percent level, *p*-values are in brackets.

[a] Variance inflation factor from Pooled-OLS regressions.

design that highlights the overall marginal effects of board structure variables on firms' ROA. This equation validates the random-effects model providing consistent estimates according to the Hausman specification test. Regression equations (2)–(4) complement the analysis in highlighting the marginal effect on firm ROA due to changes on board independence with different set of controls.[14]

Several are the finding results worth mentioning. First, board variables affect firm performance and profitability. The outside director ratio coefficient ranges from 2.5 to 5.6 percent, which reflects an average change in ROA of 1.1 percent when a board with no outside members fulfils the 25 percent quota for governance standards. This result supports Dahya et al. (2008) and shows that the appointment of independent directors by dominant blockholders offsets the discount of firm valuation in markets with weak investor protection. Our study sample is dominated by privately held firms with blockholders affiliated with a given business group. Despite not being required to appoint outside directors, these firms in fact do so because some of group's firms are public and subject to governance standards and best practices codes. Nonetheless, this positive effect is partially offset by the interaction between the equity rights of the largest shareholder (CR1) times the board independence ratio, which is negatively related. Overall the marginal effect of increasing the number of outside directors by 25 percent is 0.3 percent.[15]

Second, directorate interlocking matters to firm performance. Aside from the appointment of outside directors, the role of these structural variables is the main focus of analysis. Interlocks of board members are a consequence of ownership structures and blockholders' activism. The empirical issue of control contestability among large shareholders has been particularly tested in Europe (Jara-Bertin et al., 2008), where the finding for family-controlled firms is that the potential formation of coalitions and the control of the largest voting-block affect firm value. Blockholders' activism is markedly sensitive in Colombia, where no restriction on cross-share holdings triggers several forms of board interlocking, through direct appointment of relatives of the founding family, dual CEO appointments, and the presence of busy insider directors.

According to the regression equations in Table 8, five board interlocking indicators were robust determinants of firms' ROA. The first shows the role of family members, in two opposite results. When the firm's CEO is a member of the founding family [*Family_CEO*], firm's ROA decreases by 2.5 percent on average, but family members who are active directors have a positive effect through better monitoring. Specifically, the regression coefficients indicate that if family board appointments increase by one chair out of five, the firm's ROA rises an average of 5 percent.

The second type of interlock relates to the role of busy directors. Three variables in the regressions capture the effect of directors' multiple appointments. Busy directors are usually distinguished by reputational factors, measured by the number of external seats in companies within and outside the business group. The results show that overall directorate reputation increases firm performance by 0.9 percent if a company's board members raise the number of external appointments by 10 percent. This result captures the positive effect of director quality. Busy directors are valuable in the market because of their specific knowledge and management experience. However, this positive effect is clearly offset by the over-commitment of the most well-connected director (0.5 percent). This finding also confirms the busyness hypothesis: an over-committed director loses a leadership controlling role because too many active appointments imply a rent-seeking behavior. The above findings are reinforced with the positive effect of outside interlocks. This variable measures the number of external directorships

[14] The null hypothesis in the Hausman test assumes that the random effects model is the true model and the variance–covariance matrix (VCE) is efficient. Therefore, one cannot reject the null hypothesis that the difference in regression coefficient is systematic between the fixed versus random effects specifications. Regression equations (2)–(4) failed to pass the Hausman specification test but in presence of heteroscedastic residuals, which is the case, the scope of this test is limited. In fact, this is a serious shortcoming of the standard Hausman specification test. Instead, what is recommended is to apply related tests based on bootstrapping methods (Baltagi, 2008; Cameron & Trivedi, 2010; Wooldridge, 2002). The tests displayed in Table 8 are based on non-weighted normal standard errors. Standard errors in the table are all corrected by White–Hubbert robust regression estimates. The empirical model also depends on time invariant dummies. On the other hand, the Lagrange multiplier test consistently rejects the null hypothesis of no existence of individual effects. Because of the above reasons the random effects model is chosen.

[15] More accurately, the marginal effect is equal to: $\Delta ROA/\Delta X = 0.056 - 0.078 \times \overline{CR1} \rightarrow \Delta ROA = [0.056 - (0.077 \times 0.54)] \times 0.25 = 0.0003$, where ΔX = outside director ratio change equal to 0.25, and $\overline{CR1} = 0.54$ (Eq. (4)).

in firms affiliated with other business groups. In particular, if the number of this type of external directorship rises by 10 percent within boards, firm ROA increases by 0.2 percent (Eq. (1)). Thus, outsider busy directors matter in forming more professional directorates and controlling the quality of a firm's investment projects and funding sources.

Third, board demographic variables are robust controls in all regressions and are negatively related. As expected, greater rates of director turnover reduce firm performance, which triggers board and firm management restructuring (Denis & McConnell, 2003). In contrast, the effect of gender diversification is contrary to the expected relation. Women comprise 10 percent of board directors according to the distribution median, a number close to what is observed in Australia and across large European corporations. As a matter of corporate governance, Scandinavian countries have set a quota for women's representation on boards across listed companies. Studies on board diversity have shown that gender diversity affects firms' internal governance and yields better ex post firm performance.[16] Board variables are significant in most cases at 5 percent.

Fourth, ownership and blockholders' contestability variables are important to firm performance. This is a strong result that validates the hypothesis of the private-bias control and direct monitoring of management by large shareholders according to regression equations (1)–(4) in Table 8. Ownership concentration measured either by the Herfindal index of the top four shareholders or by the CR3 concentration ratio, is positively related to firm ROA. For instance, if HI increases by 10 percent, ROA rises between 1.9 and 3.4 percent. Control contestability indicators were significant in all cases for the regression estimations. Three indicators were included: the contestability index, the Herfindal differences and the Shapley value. The first two capture the control effect among larger blockholders that are positively related to firm performance. Thus, as long as the second and third blockholders' voting power increases relative to the largest one, rent diversion is deterred. The *Shapley value* is negatively related with firm performance, as expected. This number measures the probability that the largest shareholder will lead a sustainable coalition. Regression equations show that a 10 percent increase in this probability lowers firm ROA by 3 percent on average. These results accord with what has been found in other studies of control contestability, in particular for a sample of security issuers in Colombia (Gutiérrez & Pombo, 2009a).

The last control variable regarding ownership is the separation ratio. This finding result shows that the separation ratio is positively related for the third blockholder. This is contrary to what is expected in theory because the greater the divergence between equity ownership and voting power, diversion of funds and tunneling is more likely to occur. An alternative interpretation for this particular result concerns the third largest blockholder, who has 6.5 percent of equity share and voting rights of around 12 percent at the distribution median. This implies that this blockholder might contest the first or second largest stakeholder if they do not form a sustainable coalition to get absolute control. Thus, as long as the third largest blockholder increases its voting power, the greater is its control contestability on the fringe. In this way one can expect a positive result.[17] Ownership and all control contestability variables are significant at 5 percent in the model.

Fifth, the empirical model also controls for firm financial and characteristic variables, such as firm size, age, leverage, dividend payout ratio and two dummies for auditing firm and business group affiliation. The last two exhibit a result opposite to that expected. According to models of internal capital markets, business group affiliation is important for easing firm financial constraints, for which one should expect a premium on the market value of a firm's assets. Further, previous estimations done for listed firms in Colombia (Gutiérrez & Pombo, 2007) have stressed the positive relation between

[16] Kang, Cheng, and Gray (2007), report that the fraction of female directors in 100 Australian corporations in 2003 was 10.4 percent. According to the European Professional Women's Network Board Women Monitor 2008, the percentage of women on boards of the top 300 European companies was 9.7%. Regarding the effect of board diversity and firm governance, see the studies of Hyland and Marcellino (2002), and Vafeas and Theodorou (1998).

[17] Firm value regressions based on high liquid stocks sample form Colombian listed firms show a negative effect, but not statistically significant relation between the top-four shareholders separation ratio and Tobin's *Q*. The marginal effect is −0.023, meaning that if wedge increases by 10 percent firm value decreases by 0.23 percent. For more details, see Gutiérrez and Pombo (2009a). Different wedge measures were included in the estimates, but they turned out not statistically significant in the regression equations.

Tobin's Q and firm's affiliation status. The inclusion of an increasing number of privately held firms in the estimations might be evidencing some tunneling among affiliated firms. However, blockholder contestability variables deter any fund diversion. These controls are robust disregarding the estimating sample.

In the same direction, if financial statements are being audited by an external firm, one should expect trustworthy information disclosure and governance standards. An additional explanation for the negative effect of audit on firms' performance could be due to earnings management. Better corporate governance and audit monitoring constrain earnings management opportunities and makes the profit figures less easy to be discretionarily manipulated. However, adding these dummy variables to the estimating equation does not improve overall robustness. The best specification is given by Eq. (1), which does not include those controls.[18]

4.2. Robustness analysis

The estimation of the baseline random-effects model in Eq. (1) suffers from identification and double causality problems that arise because the appointment of outside directors is a mixed process that combines exogenous and endogenous decisions (Black & Kim, 2010). On one hand, security issuers are subject to new corporate governance regulation in setting auditing committees and minimum quota for independent members on directorates; on the other hand corporate governance practices in all Latin American countries follow the "comply or explain" principle, which implies voluntary adoption of better governance standards. Thus, levels above the law's compliance threshold and corporate best practices within privately held firm, besides being voluntary, are unregulated and endogenous by definition. A standard approach to this problem is to rely on instrumental variables regressions, which treat the outside director ratio as an endogenous variable. The main exogenous instruments included were the lag of the outside director ratio, the number of voting blocks and a dummy variable that describes whether the largest blockholder has absolute firm control.

Table 9 displays the regressions for the main random-effects instrumental-variables (RE-IV) for the two measures of firm performance. The main outcome regarding the ROA empirical equations (1) and (2) is that the variables for the direction of the board structure and board demographics keep the expected sign and coefficient size in almost all cases as robust controls. In particular, board interlock variables remain significant for the model. Overall directorate reputation will increase ROA by 1 percent when directors' total number of external seats rises by 10 percent. When family members increase their appointments by 10 percent, ROA will rise by 3 percent. The over-commitment effect is still present in a negative impact of the most well-connected director, and bad firm performance is still associated with a CEO from the controlling family. The outside director ratio is significant only in Eq. (2) at 10 percent. Regarding the set of controls included in the model, such as board demographics, ownership and corporate control, financial and firm characteristics, variables remain statistically significant in most cases, keeping the expected sign.

ROE regressions are included for completeness of the analysis (Eqs. (3) and (4)). As mentioned, this variable is highly volatile because of its dependence on firm capital structure. However, two main results from those regressions are worth highlighting. First, board-interlocking proxies have the same effects when disregarding the specification RE or RE-IV estimates. The role of busy directors and board interlocks with outside business group is still positive. These equations add to the effect of busy insider directors, which is negatively related; on average this dummy decreases firm ROA by 7.5 percent. This finding is important from a governance point of view because it might be capturing perverse effects of rent diversion across holding firms and rent seeking through related transactions. Nonetheless, this variable was not significant in the ROA regressions where blockholder contestability variables

[18] The overall goodness of fit (R^2) for the RE regressions indicates that the model explains at most 47% of firms' ROA. Regression equations consistently reject the null hypothesis that all joint regression coefficients are zero by Wald test. The above tests are complemented by the mean of the variance inflation factor (VIF), which records low levels. This indicates no severe multicollinearity across the set of independent variables. Regression residuals are still not normally distributed according to the Shapiro–Wilk test. The problem in those estimates is explained more by a moderate excess of kurtosis rather than non-normal skewness.

Table 9
Firm performance – instrumental variables regressions.

	Return on assets (ROA)		Return on equity (ROE)	
	Eq. (1)	Eq. (2)	Eq. (3)[a]	Eq. (4)
Variable				
Outside director ratio	0.026	0.029	0.213	0.633
	(0.020)	(0.018)**	(0.221)	(0.369)**
Family_CEO	−0.020	−0.021		
	(0.014)	(0.012)**		
Family members participation	0.030	0.032		
	(0.015)**	(0.013)*		
Directorate reputation	0.010	0.008	0.235	0.281
	(0.004)*	(0.004)*	(0.066)*	(0.112)*
Best director reputation	−0.004	−0.003	0.068	−0.079
	(0.002)*	(0.001)*	(0.026)*	(0.034)*
Board interlocks outside BG	0.002		0.011	0.009
	(0.001)		(0.124)	(0.153)
Busy directors insiders			−0.082	−0.072
			(0.038)*	(0.036)*
Board turnover participation	−0.017	−0.016	−0.269	−0.282
	(0.007)*	(0.008)*	(0.169)**	(0.175)**
Female participation	−0.052	−0.054		
	(0.012)*	(0.013)*		
Herfindal_concentration	0.019			
	(0.017)			
Shapley value	−0.027	−0.018		
	(0.011)*	(0.007)*		
Equity-voting ratio 3th blockholder			0.486	0.530
			(0.211)*	(0.313)**
Sum blocks			−0.088	
			(0.048)**	
Age × Firm size	1.3E−05	1.3E−05		
	(7.2E−06)**	(6.5E−06)*		
Firm size (Log Assets)			−0.160	−0.162
			(0.553)*	(0.097)**
Dividend payout ratio	0.095	0.093		
	(0.036)*	(0.071)		
Leverage	−0.201	−0.203		
	(0.034)*	(0.036)*		
Asset tangibility			−1.442	−1.540
			(0.451)*	(0.796)*
Constant	0.033	0.034	3.32	2.89
Dummy for residual outliers	Yes	Yes	Yes	Yes
Regression statistics				
Obs	3288	3288	3213	3213
Number of groups	374	374	368	368
R^2-overall	0.47	0.47	0.27	0.27
Wald-test	319.4	293.97	35.43	17.96
	[0.000]	[0.000]	[0.000]	[0.055]
Mean VIF (multicollinearity)[b]	2.04	1.84	2.52	2.54
Shapiro–Wilk normality	16.1	18.2	18.2	18.8
	[0.000]	[0.000]	[0.000]	[0.000]
Specification tests for random-effects				
Lagange multiplier test for RE			2709	
			[0.000]	
Hausman specification test			32.76	
			[0.0001]	
Instrumented variable	out_dir_r	out_dir_r	n.a	out_dir_r

Instruments: Eq. (1), Eq. (2) and Eq. (4): Outside director ratio = lag outside director ratio + control block 1 + sum-blocks + **Z**. The vector **Z** includes the other exogenous variables included in the instrumented equation.
Notes: Bootstrap standard errors in parenthesis with 50 interactions for IV estimates: **significant at 10 percent; *significant at 5 percent.
Robust standard errors for RE equation [Eq. (3)]; *p*-Values in brackets; complete variable definitions are in Appendix A

[a] This regression equation refers only to the random-effects estimates on firms' return on equity.
[b] Variance inflation factor from Pooled-OLS regressions.

are robust controls. Therefore, the above partial effect cannot be at all conclusive. Second, the outside director ratio becomes significant when it is instrumented. In particular, when the outside director ratio increases by 10 percent, ROA rises by 6 percent (Eq. (4)). This result corroborates the endogeneity hypothesis that blockholder activism sets directorate structure. Hence, the empirical model based on ROA is robust and consistent with the theory, and regression coefficients are unbiased and efficient estimators.

5. Conclusions

This study provides, for the first time, measures of corporate governance variables associated with boards of directors in Colombia. It is the first empirical study in Latin America to use a sample with a high proportion of privately held firms, most of them belonging to family business groups. Measurement results show that the outside director ratio for affiliated firms has decreased from a median of 28 percent during the late 1990s to 18 percent during the 2000–2006 period, while the composition of boards of publicly held companies has shown a constant 50 percent outsiders despite the delisting problem observed during this time span. Directorate interlocking measurements indicate that busy insider and outsider directors are common across firm directories.

Outside directors, and busy ones in particular, have a positive influence on firm performance according to the econometric results. However, too many appointments for a particular director have a negative effect according to the busyness hypothesis. Board structure variables are robust determinants for firm performance regardless their listing status. Regressions are controlled by ownership and blockholder contestability variables, which reflect the effect of shareholder activism on boards' composition and implied supervision duties. The results confirm that cash flow tunneling is deterred by control contest across blockholders. Estimates of instrumental variables suggest that the appointment of outsiders is endogenous within an environment where there is no specific law regarding board independence, which is the case for privately held firms. Policy implications regarding the positive correlation between better corporate governance standards and firm performance can be derived from this study. Privately held and family-controlled firms benefit from the appointment of outside directors, who are valued for their reputation, knowledge and managerial experience.

Acknowledgments

We specially want to thank the comments and suggestions of an anonymous referee, which improved considerably the revised versions. We also want to thank the Journal editors John Kopecky and William Tagart for their support to this work, the seminar discussants at the World Finance Conference held at Vianna do Castelo, Portugal (May 2010) and the 2009-MFA meeting in Chicago. Additional thanks to Martjin Cremers, Melsa Ararat and Burcin Yurtoglu at the Global Corporate Governance Forum on Leading Issues on Corporate Governance in Emerging Markets, held at the Millstein Center, Yale University (Fall 2008). And we thank the research assistance of Ph.D. students Maria-Andrea Trujillo and Alexander Guzman from the School of Management at Universidad de los Andes. The usual disclaimer applies.

Appendix A.

See Table A1.

Table A1
Definition of variables.

Board variables	
Board size	Total number of directors. Includes principals and substitutes
Family CEO	Dummy variable equal to 1 if the CEO has the founding family last name, and 0 otherwise
Female	Number of board seats occupied by women
Female participation	Percentage of board seats occupied by women
Foreign	Number of board seats occupied by foreigners.
Foreign participation	Percentage of board seats occupied by foreigners
Family board	Total number of directors who have the same the same founding family last name and descendants (heirs), or CEO's last names.
Family board participation	Percentage of directors who have the same the same founding family last name and descendants (heirs), or CEO's last names
CEO turnover	Dummy variable equal to 1 when there is a change in CEO for each firm i and for each year *t*, and 0 otherwise
Board turnover	Number of directors of year *n* that are no longer on the board at year *n* + 1.
Board turnover participation	Percentage of directors at year *t* that are no longer on the board at year *t* + 1
Board turnover dummy	Dummy variable equal to 1 if there is a change in a director for each firm i and for each year *t*, and 0 otherwise.
Auditing firm	Dummy variable equal to 1 if the audit of financial statements is done by a firm, and 0 otherwise
Interlocks insiders	Board interlocks within business group: Number of external directorships held by a board member within firms affiliated with the business group. Restricted only to firms in the sample
Interlocks outsiders	Board interlocks outside business group: Number of external directorships held by a board member within firms affiliated with other business groups. Restricted only to firms in the sample
CEO board dummy	Dummy variable equal to 1 if a firm's CEO sits on its board, and 0 otherwise
CEO director duality	Number of directors who are CEOs of other firms into the same business group. For firms without business group affiliation, number of directors who are CEOs of other firms
Reciprocal CEO interlocks	For a firm i, the number of times that its CEO sits on the board of a firm whose CEO is reciprocally seated on the board of firm *i*
Outside director	Number of board members who have not been managers of the firm, who were never managers in any related firm, who do not sit on any of the boards of related firms and do not have family ties with founding family or the CEO as far as the scope of the sample allows us to tell besides than being on the board of directors for all interval of time
Outside director ratio	Percentage of board members who have not been managers of the firm, who were never managers in any related firm, who do not sit on any of the boards of related firms and do not have family ties with founding family or the CEO as far as the scope of the sample allows us to tell besides than being on the board of directors for all interval of time
Reputation directorate	Total number of external directorships held by the board members within firms affiliated with the business group or other businesses groups divided by board size
Best Director reputation	Max number of external seats (chairs) held by a single individual in a given firm board of directors
Busy director	Total number of busy directors. A busy director is a dummy variable equal to 1 if the number of directorships held by a board member within firms affiliated with the business group or other businesses groups is more than two, and 0 otherwise. Restricted only to firms in the sample
Busy director insider	Number of busy directors who are insiders at the same time
Busy director outsider	Number of busy directors who are outsiders at the same time

Table A1 (*Continued*)

Ownership and control variables

Equity 1–4	The fraction of cash flow rights held by the first, second, third, and fourth largest blockholder, respectively
Votes 1–4	The fraction of voting rights held by the first, second, third, and fourth largest blockholder, respectively
Equity-voting ratio 1–4 (SR)	The cash flow rights divided by voting rights for the first, second, third and fourth largest blockholder, respectively
Herfindal index concentration	Herfindal concentration index. The sum of the squares of the four largest equity stakes (HI-ER4) or voting stakes (HI-VR4). $[(\text{equity } 1)^2 + (\text{equity } 2)^2 + (\text{equity } 3)^2 + (\text{equity } 4)^2]$ or $[(\text{votes } 1)^2 + (\text{votes2})^2 + (\text{votes3})^2 + (\text{votes4})^2]$
Herfindal index differences	The sum of the squares of the differences between the first and the second equity stakes (HIDE) or voting stakes (HIDV) and the third and fourth largest equity stakes or voting stakes: $[\text{equity } 1 - \text{equity } 2]^2 + [\text{equity } 2 - \text{equity } 3]^2 + [\text{equity } 3 - \text{equity } 4]^2$ or $[\text{votes } 1 - \text{votes } 2]^2 + [\text{votes } 2 - \text{votes } 3]^2 + [\text{votes } 3 - \text{votes } 4]^2$
Contestability index	Ownership rights of the second and third blockholder relative to the largest blockholder. CI = (equity 2 + equity 3)/equity 1
Non-majority dummy	Non-majority V1 + V2 < 0.5: Dummy variable equal to 1 if the sum of the voting rights held by the two largest shareholders does not exceed 50 percent, and 0 otherwise. Non-majority V1 + V2 + V3 < 0.5: Dummy variable equal to 1 if the sum of the voting rights held by the three largest shareholders does not exceed 50 percent, and 0 otherwise
3rd blockholder dummy	Dummy variable equals 1 if the firm has a third blockholder. A blockholder is defined as an investor with 10 or more direct (ownership) voting rights in the firm
4th blockholder dummy	Dummy variable equals 1 if the firm has a fourth blockholder. A blockholder is defined as an investor with 10 or more direct (ownership) voting rights in the firm
Shapley Value	The Shapley value solution for the largest shareholder in a three-voting coalitional game
Sum blocks	The sum of a given firm's blockholders. A blockholder is defined as a shareholder with at least 10 percent of firm's equity rights (direct votes)
Control block1	Dummy variable equal to 1 if the voting rights (direct + indirect) held by the first largest blockholder exceed 50 percent of total votes and 0 otherwise

Financial and firm characteristics variables

ROA	Return on assets after interest, tax, depreciation and amortization (or net income) divided by total assets
ROE	Return on equity as earnings before interest, tax, depreciation and amortization divided by book value of shareholder equity
Profit dummy	Dummy variable equal to 1 when the firm *i* reported profit in the year *t*, and 0 otherwise
Leverage	Firm leverage defined as the ratio between the sum of book value traded liabilities and banks liabilities divided by total assets
Dividend payout ratio	Amount of dividend payout in Colombian pesos for each firm *i* at year *t* divided by total assets book value
Dividend dummy	Dummy variable equal to 1 when there is a dividend payout, and 0 otherwise
Industry sector dummy	Dummy variable equal to one for a given firm's industry sector and cero otherwise. Industry sector follows the International Standard Industry Classification (ISIC) two-digits code Rev. 2
Firm age	Firm age as the number of years since the firm's startup year
Firm size	Firm size as the natural log of the book value of total assets. Values are in millions of Colombian pesos at 1999 prices
Auditing firm	Dummy variable equal to 1 if the audit of financial statements is done by a firm, and 0 otherwise
Growth opportunities (assets)	Firm's growth opportunities as the real annual growth of tangible fixed assets. Nominal value series deflated by Colombia's CPI
Growth opportunities (sales)	Firm's growth opportunities as real annual growth of sales. Nominal value series deflated by Colombia's CPI
Assets tangibility	Tangibility as the sum of inventories and fixed tangible assets divided by total assets
Group affiliation dummy	Dummy variable equal to 1 if the firm is affiliated to a given business group and 0 otherwise

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