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The Effect of Intra-Group Loans on the Cash Flow Sensitivity of Cash: Evidence from Chile

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Abstract

We examine the effects of internal capital markets on the propensity of firms to save cash from cash flows (i.e., the cash flow sensitivity of cash). We argue that firms that are net providers of funds to related parties must maintain a higher cash flow sensitivity of cash to prevent high levels of pressure on their cash holdings in contrast to net receivers of intra-holding funds. Based on a panel of listed firms in Chile, we test this premise and examine how a firm's differences in accounts receivable and accounts payable from related companies affects its cash flow sensitivity of cash. The results confirm that firms with high levels of net loans to related companies have higher cash flow sensitivities of cash and that this relationship is strongest for firms affiliated with business groups and family-owned firms. Furthermore, providers of funds that have the propensity for high savings are those firms that are more financially constrained suggesting that the cash flow sensitivity of cash is an adequate indicator to capture financing constraints.

Keywords: Internal capital markets, cash flow sensitivity of cash, pyramidal structure, business groups, financial constraints.

JEL codes: G32.

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El efecto de los préstamos intra-grupo sobre la propensión a ahorrar en activos líquidos: Evidencia de Chile

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Resumen

Este documento examina los efectos de los mercados internos de capital sobre la propensión de las empresas a ahorrar dinero en efectivo a partir de los flujos de efectivo (es decir, la sensibilidad al flujo de efectivo del efectivo). Argumentamos que las empresas que son proveedoras netas de fondos para partes relacionadas deben mantener una mayor sensibilidad al flujo de efectivo del efectivo para evitar altos niveles de presión sobre sus tenencias de efectivo, en contraste con los receptores netos de fondos dentro de la tenencia. Con base en un panel de firmas cotizadas en Chile, probamos esta premisa y examinamos cómo las diferencias de una empresa en las cuentas por cobrar y en las cuentas por pagar de las compañías relacionadas afectan su sensibilidad al flujo de efectivo del efectivo. Los resultados confirman que las empresas con altos niveles de préstamos netos a empresas relacionadas tienen una mayor sensibilidad al flujo de caja de dinero en efectivo y que esta relación es más fuerte para las empresas afiliadas a grupos empresariales y empresas familiares. Además, los proveedores de fondos que tienen la propensión a obtener altos ahorros son aquellas empresas que tiene mayores restricciones financieras, lo que sugiere que la sensibilidad al flujo de efectivo del efectivo es un indicador adecuado para capturar las restricciones de financiamiento.

Palabras clave: mercados internos de capital, sensibilidad al flujo de efectivo del efectivo, estructura piramidal, grupos empresariales, restricciones financieras.

Códigos JEL: G32.

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1. Introduction

The role of operating cash flow in firm cash policies is a point of contention in the literature regarding financial constraints. Almeida et al. (2004) find that financially constrained firms have a positive cash flow sensitivity of cash holdings for precautionary savings reasons. Follow up studies verify this argument and find that the cash flow sensitivity of cash is indeed higher in subsamples that are more likely to suffer from financing constraints, such as smaller firms, low dividend paying companies, and firms without bond or commercial paper ratings (Khurana et al., 2006; Han and Qiu, 2007; Lin, 2007; Sufi, 2009).

In contrast, Riddick and Whited (2009) re-examine this argument with a different theoretical and empirical model specification and find the relation between changes in cash holdings and cash flow is actually negative. They argue that a firm's cash flow sensitivity of cash is driven by fluctuations and uncertainty of income rather than by the emergence of binding external financing constraints. Furthermore, Bao et al. (2012) determine that the cash flow sensitivity of cash exhibits asymmetrical cash sensitivity when facing positive or negative cash flows. This asymmetry may be due to several factors including binding project contracts, withholding of bad news, and agency costs. Overall, the literature provides no consensus on the sign and determinants of the cash flow sensitivity of cash.

This paper explores the internal capital markets among related companies as another explanation for the propensity of companies to save cash from operating cash flows. In particular, using a sample of Chilean firms listed on the Santiago Stock Exchange, we examine the effects of internal capital markets on the propensity of firms to save cash from cash flows (i.e., the cash flow sensitivity of cash). To the best of our knowledge, no prior study has directly examined the effects of internal capital markets on the cash holding policy

of firms. Previous studies, including Bertrand et al. (2002) and Almeida and Wolfenzon (2006a, b) suggest that group affiliated firms can eliminate the potential effect of operating cash flows on cash savings. However, none of these papers directly examine the internal capital markets of business groups.

Chile provides an especially suitable corporate framework to test the effect of internal capital markets on cash holding policies. Regulations of Chile's internal capital markets require every listed firm to report a line called "notes and accounts payable from related companies" on both the liability and the asset side of the balance sheet.[1] These accounts allow us to precisely measure the use of internal capital markets by these firms in Chile. Intra-group lending data taken from the financial statements of Chilean companies has been previously used by Buchuk et al. (2014) to test whether intra-group lending can be motivated by tunneling or by a financing advantage. They find that the activity of internal capital markets is better explained by the financing advantage. They also demonstrate that firms that borrow internally have higher investments, leverage, and return on equity than other firms. However, this study does not address the question of whether the levels of intra-group lending affect firms' cash holdings or the cash flow sensitivities of cash. Thus, our paper extends the literature on firm financial constraints by establishing a direct link among cash holdings, operating cash flow, and internal capital markets.

Two contrasting arguments predict the relationship between internal capital markets and

[1] The Chilean regulator defines a "related party" as any entity or person that: 1) is an affiliated company that directly or indirectly controls, or is controlled by, or are under common control by a third company (control exists when an entity, person, or company own 50% or more of the outstanding shares or voting rights of a company and has control over financial and operational decisions of another company), 2) is owner of 10% or more of voting rights, is a director, or is part of the management team, 3) is a family member of the owner, director, or a management team member, and 4) may significantly influence management decisions or operational politics in the company. Examples of related parties' transactions are transactions among parents and subsidiaries, among subsidiaries of a common parent, and transactions with management team members, main shareholders, or their families (e.g., Technical Note # 16 of the Accounting Standards Board of Chile).

cash holdings. The literature argues that one of the positive aspects of internal capital markets of business groups is that they allow group members to overcome financial market constraints and that the use of intra-group loans is an especially useful solution for underdeveloped capital markets (Khanna and Yafeh, 2007).

For instance, Byun et al. (2013) find that Korean business groups enjoy lower external costs of debt than standalone firms, which is consistent with the co-insurance effect that comes from group level resources and cross pledgeable income. Almeida et al. (2015) analyze the strategic role that intra-group lending played within Korean *chaebols* in the aftermath of the 1997 Asian crisis. They find that affiliated firms undertook cross-firm equity investments as a mechanism for direct funding from firms with low to high growth opportunities within conglomerates demonstrating ex-post positive effects on firm investment rates and market value.

In the case of Latin America, a number of studies have shown that there is active relational lending among firms affiliated with business groups. Providers and receivers of intragroup lending enjoy more favorable conditions regarding maturities and interest rates. For instance, La Porta et al. (2003) find that when Mexican banks make loans to firms controlled by the banks' owners, the lending tended toward better terms, but was more likely to default. More recently, Buchuk et al. (2014) provide evidence that Chilean firms that are close to each other in the control pyramid and belong to the same industry or are in more integrated sectors, tend to form lending relationships that respond to financial advantages rather than tunneling attempts using related party transactions.

In the present study, we extend the literature on firm cash policy (Almeida et al., 2004; Riddick and Whited, 2009, Pal and Ferrando, 2010) by incorporating the use of internal capital markets in the role of operating cash flows in firms' cash policies. We argue that firms

that have access to intra-group financing and that are receivers of net loans should display a lower (or even negative) propensity to save cash from their cash flows. Affiliated firms that are net providers within a given conglomerate need to keep higher cash flow holdings and, as such, display greater sensitivity of cash to avoid greater pressure on their cash holdings and possible financial distress. In other words, firms that invest in related companies (i.e., firms with positive net loans) save more cash from their operating cash flow into liquid asset holdings, rather than into physical capital or shareholder distributions, than firms with lower net loans. Thus, net providers of loans should display higher cash flow sensitivities of cash.

In particular, we empirically examine whether the cash flow sensitivity of cash is moderated or strengthened by the levels of lending they provide and receive from related companies. Our results indicate that firms with high levels of net loans, defined as the difference between accounts receivable and accounts payable from related companies, funnel a more substantial portion of their cash flow into cash holdings than firms with fewer net loans. These results are consistent with the hypothesis that firms that provide funds to related parties need to save more cash from their cash flow to support associated companies. Meanwhile, firms that are net receivers of loans from affiliated companies (i.e., firms with negative net loans) save less cash from their cash flow than other firms as they benefit from their access to internal capital markets.

We expect the effect of internal capital markets on cash flow sensitivities to be strongest for affiliated firms and, particularly, when affiliated with family groups, when compared to comparable standalone firms. In that sense, we test this hypothesis by performing several cross-sectional tests to determine whether firms are affiliated, family controlled entities or standalone, non-family controlled firms. We find that the cash flow sensitivity of cash is positive and greater for affiliated firms than standalone companies. One explanation for this

result is that access to business groups allows firms to intensify the use of intra-group funding. Thus, firms' use of internal capital markets can explain the higher cash flow sensitivity of business group members with higher net loans. This relationship also holds true for family-owned firms.

We also investigate the possibility that the cash flow sensitivity of cash at high levels of net loans is driven by the presence of external financial constraints. The expected relation is that firms under financial constraints increase their need for saving cash when they provide funds to related companies. Our findings are in line with this view for different proxies of financial constraints. Financially constrained firms exhibit greater cash flow sensitivities of cash than their financially unconstrained peers.

Finally, we consider the impact of agency problems and possible tunneling behavior using intra-group loans. In particular, the paper analyzes the effect of excessive control rights and ownership concentration on the relationship between cash flow sensitivity and net loans. We do not find evidence consistent with the hypothesis that excessive control rights and concentration of ownership increase the cash flow sensitivity of cash at high levels of net loans due to better monitoring. In fact, conversely, we find that listed family firms with fewer control rights and lower concentrations of ownership significantly increase their levels of response to their cash holdings when faced with high net loans to related firms. These results are consistent with Buchuk et al. (2014), who find that local financial regulation makes tunneling through intra-group loans much harder for the case of Chile.

The remainder of the paper is organized as follows. Section 2 describes the analytical framework and the development of the working hypotheses. Section 3 introduces the empirical methodology and describes the dataset. Section 4 discusses the empirical results, while Section 5 provides the conclusions.

2. Hypothesis Development

The literature regarding intra-group lending has stressed several financial and organizational advantages of cross-firm funding, either by providing loans to or by directly making equity investments in related firms. Market friction, such as asymmetric information and agency problems, often leaves firms with very expensive borrowing opportunities and, sometimes, with no access to external financing at all. These market imperfections limit the amount of investment that firms can undertake in projects with positive net present and severely deteriorate firms' future growth prospects. Intra-group loans have been one of the responses used by firms in underdeveloped capital markets to overcome external financial market friction and constitute an effective mechanism to alleviate firm financial constraints (Khanna and Yafeh, 2007), especially for firms affected by sudden shocks in the loan markets as those observed during a financial crisis (Buchuk et al., 2017)

Studies regarding internal capital markets suggest several ways in which the affiliation with business groups negatively affects the cash holdings of affiliated firms. For instance, the previous literature has shown that debt contracts among related parties allow the mitigation of information asymmetries and facilitates contract enforcement, both problems typically associated with external financing.[2] The immediate access to internal financing suggests that these companies would not need to maintain higher levels of liquid assets to finance future projects. In addition, another strand of the literature suggests that business groups' reputational capital in financial markets often helps affiliated firms to easily substitute cash savings with external financing.

This study argues that there is a relationship among intra-group loans, cash holdings, and

[2] See Maksimovic and Phillips (2013) for a review of the bright side of internal capital markets.

the cash savings. More specifically, the magnitude and the direction of the flow of funding among related companies should depend upon the type of financial constraints faced by the different members within the group and also by the difference between the returns on investment opportunities and the cost of funding for each firm. If affiliated firms with liquid resources funnel investment projects to related firms with high growth opportunities, the flow of funding then becomes a direct test regarding internal capital markets efficiency (Almeida et al., 2004).

Consequently, this work extends the empirical models on a firm's liquidity demand (Almeida et al., 2004; Dittmar and Smith, 2007; Riddick and Whited, 2009) by incorporating the use of internal capital markets in the role of operating cash flow in firms' cash policies. Intra-group loans change the responses of cash holdings to cash from operations. In particular, we argue that when a firm is a net provider of loans to related companies, it must save more cash to pursue future investment opportunities in related companies, which, in turn, leads to a higher cash flow sensitivity of cash. Thus, the cash flow sensitivity of cash is augmented by the level of intra-group loans. It follows that the first hypothesis is:

H1. The magnitude of the cash flow sensitivity of cash increases with the level of net loans to related companies.

The seminal paper of Almeida et al. (2004) was based on the general idea that firms are more inclined to allocate cash flow to cash reserves when they face financial constraints, such that these firms can finance their investment opportunities. We hypothesize that if in addition to financing their own investment opportunities a firm must also provide loans to related firms, then, in the presence of market imperfections that make it difficult for the firm to obtain external financing, hording more cash would be necessary and the cash flow sensitivity of cash would be even higher. Consequently, we also consider the effects of net

loans on the cash flow sensitivity of cash when a firm faces financial constraints. We expect that when net loans are high, a financially constrained firm will continue to save more to fund related companies than externally unconstrained firms. Thus, the second hypothesis is as follows:

H2. The magnitude of the cash flow sensitivity of cash at high levels of net loans is more pronounced for a financially constrained firm than for a financially unconstrained firm.

Finally, we analyze the impact of agency problems in intra-group loans and possible tunneling behavior by including the impact of excess of control rights and ownership concentration in regards to the firm's largest shareholder. Previous studies (Bertrand et al., 2002) indicate that business groups channel resources away from firms where the controlling shareholder has low cash flow rights, and instead funnel resources toward firms where the controlling shareholder has higher cash flow rights. In addition, the presence of several large shareholders reduces the possibility of private benefits through monitoring (Gomes and Novaes, 2006; Bloch and Hege, 2001). This effect is due to the substantial financial interest in the firm that motivates them to monitor the largest shareholder in ways that curtail their opportunistic behavior. Consequently, we test the hypothesis that a firm where the ultimate large shareholder has a high excess of control rights or a high proportion of voting rights, has more agency problems due to weak outside monitoring from other shareholders. Accordingly, the magnitude of the cash flow sensitivity of cash to funnel funds to related companies is more substantial for firms with greater separation of control rights and weak outside monitoring. These conceptual elements and findings lend support to our third hypothesis:

H3. The magnitude of the cash flow sensitivity of cash at high levels of net loans increases with firm excess of control rights and ownership concentration.

3. Method and Data

3.1 Empirical Design

The empirical design examines whether firms with high levels of intra-group loans have higher levels of cash flow sensitivity of cash compared to other companies. The baseline regression equation follows the next panel specification:

$$\Delta\, CashHoldings_{it} = \alpha + \beta_1 CashFlow_{it} + \beta_2 NetLoans_{it} + \beta_3 CashFlow_t \times Net\ Loans_{it} + \gamma' X_{it} + Year_t + I_j + \epsilon_{it}, \quad (1)$$

where *i* is the firm, *j* is the industry, and *t* is the year. Δ*CashHoldings* is the change in the ratio of cash and short-term investments to total assets over total assets, *CashFlow* is cash flow from operations, and *Net Loans* corresponds to the difference between the total amount of accounts receivable and the total amount of accounts payable from related companies reported by a firm on its balance sheet.

We follow Buchuk et al. (2014) regarding the definition of *Net Loans*, and assign the end-of-year amount of accounts receivable and accounts payable reported by a firm to the dependent variable. Then, we divide the results by the firm's assets at the end of the previous year.[3] The variables of interest in this model are the interaction terms between cash flows from operation and net loans from related companies. This interaction term allows us to analyze how firms' decisions to save cash from cash flows in relation to the degree of net loans to related companies.

[3] In unreported results, we assign quarterly data to the dependent variable. In particular, we use the maximum difference between quarterly notes and accounts payable from related companies scaled to the total assets of the previous year. We perform this additional test to account for the intensity of internal capital markets during the year and the possibility that firms use related-party transactions just before the end of the year to present better financial statements. The results remained the same for both definitions of net loans.

The vector $\boldsymbol{X}_{it}$ in Equation (1) includes control variables for the following firm characteristics. *Tobin's Q* is computed as market capitalization plus total debt over the book value of total assets. *Size* is firm size computed as the natural logarithm of total sales. *CAPEX* is capital expenditures defined as the ratio of capital expenditures to total assets. *NWK* is net working capital computed as current assets minus current liabilities minus cash, all divided by total assets. *ΔNWK* is the change in the level of *NWK* from year *t-1* to year *t*. *STD* is short-term debt scaled by total assets. *ΔSTD* is the change in the level of *STD* from year *t-1* to year *t*. *External Leverage* is total debt minus net loans from related companies, all scaled by total assets. The empirical model in Equation (1) allows for time ($year_t$), industry (I_j) and firm fixed effects.

3.2 Data

The assembled dataset of this study comes from several sources. Financial information and stock prices come from *Thomson Reuters Eikon*. Measures related to our proxy of internal capital markets are from *Economatica*, a dataset specializing in publicly traded companies in Latin America. To identify business groups, their ultimate controlling shareholders, and the proxies for cash flow and voting rights, we use the list of Chilean business groups published by the Chilean stock exchange authority and from the financial regulator *Superintendencia de Valores y Seguros* (SVS). Information regarding firm family involvement, boards of directors, and top management teams comes from credit rating agencies reports, financial press, and company annual reports.

The working sample only considers stocks listed on the Santiago Stock Exchange from 1999-2014. The final dataset is an unbalanced panel of 1,268 firm-year observations from

109 listed firms.[4] Table 1 presents a summary of statistics and the number of dependent and control variables included in the estimates of the baseline regression [(Equation (1)]. Table 2 reports the sample distribution by year and industry according to internal capital market activity measured by the net loans to asset ratio. The final sample drops the outliers in the top and bottom 1% of each variable to minimize their influence. Two comments arise from the final dataset. First, the mean level of firm cash holdings is around 9% indicating that liquid assets are necessary for firms facing their levels of financial constraint even in the case of enhancing firm external borrowing possibilities through internal capital markets. Additionally, the mean (median) of net loans to assets is negative (zero), at around -77 basis points, across years and in most of the industrial sectors analyzed. These numbers suggest that half of the sample are loan providers, while the remaining half are net receivers of intragroup loans.

Insert Tables 1 and 2 about here.

4. Econometric Results

This section analyzes the relationship between net loans to related companies (defined as the difference between the total amount of accounts receivable and the total amount of accounts payable to related companies over total assets) and cash flow sensitivity of cash by first performing a univariate analysis and then estimating multivariate regressions. We further divide our sample into groups to determine whether such a relationship is driven by access to internal capital markets or by an alternative explanation, such as the presence of financial constraints or excess of control rights.

[4] Since we only include listed firms, our sample is biased to the large and mostly market-driven subset of firms. Although our sample is comparable with other studies using listed companies, the results should be interpreted with the specificities of our sample in mind.

4.1 The Effects of Intra-Group Loans on the Cash Flow Sensitivity of Cash

We analyze the effects of internal capital markets, intra-group loans, on the cash flow sensitivity of cash using a basic univariate analysis and then running a baseline regression equation for the change of cash holdings on its determinants. Table 3 presents the results of the univariate analysis for the relationship among the key variables under analysis: 1) changes in firm cash holdings, 2) intragroup net loans, and 3) firm operating cash flow. The sample is broken down by contrasting the first and fifth distribution quintiles of firm levels of cash flow and net loans variables.

Panel A reports the mean changes in cash holdings for firms with "high" and "low" net loans and "high" and "low" operating cash flows. Column 1 indicates that, overall, firms with high net loans save more cash from cash flows than firms in the low net loans group. However, this difference is not statistically significant at the usual levels. We further consider an additional dimension and partition the sample into high and low levels of net loan groups and into high and low levels of cash flows. Columns (2) and (3) report the mean levels of cash holdings changes for the 1st and 5th quintiles. The differences are statistically significant within the high net loans firms; that is, within the conglomerates' providers of capital financing. Firms with low operating cash flows have a negative mean of -2.93% in their change in cash holdings, while providers with high operating cash flow experience significant increases in cash holdings of 2.62%.

More importantly, we find that not all firms with high cash flows from operation save the same. Rather, firms that generate high cash flows from operations with high net loans to related companies have a significantly higher cash flow sensitivity of cash. Firms that are loan providers with high operating cash flow ratios have a mean of liquidity holdings changes of 2.62% vs. -0.87% for low liquid providers. Mean differences are statistically significant

at the 5% level.

Panel B replicates the analysis for the median changes in cash holdings for firms ranked by low (high) net loans ratio and by low (high) operating cash flow ratios. The results hold and they are similar to the median changes when we contrast the 1st and 5th distribution quintiles. The median values are lower that means resulting in left skewed distributions.

Insert Table 3 about here.

Table 4 displays the multivariate OLS and FE results of the baseline regression estimates, testing the mediating effect that internal capital markets have on firms' cash holding changes. We note that the coefficient for the variable *Cash Flow* is positive across the all specifications. As expected, firms appear to save more cash when they generate higher cash flow. To put the economic significance of this coefficient in concrete terms, and based on the results of Column 2 in the table, an additional $1 Chilean peso (CLP) in cash flow generates, on average, an additional 12.5 cents of cash holdings. This result is consistent with Almeida et al. (2004) and with previous evidence indicating that firms allocate a large part of their internally generated funds to cash holdings (Acharya et al. 2007; Lin 2007; Pal and Ferrando 2010).

The regressions in Columns (2)-(5) of Table 4 include the variables of interest, *Net Loans* and the interaction *Cash Flow* · *Net Loans*, as well as the control variables. The coefficients for the interaction terms between cash flow and net loans is consistently positive and statistically significant across all specifications. The mean value of this coefficient is 1.74. The effect of net loans on the marginal effect turns positive on percentiles above the distribution median. For instance, according to the results in Column 4 of Table 4 (our more comprehensive specification), an increase of CLP$1 in operating cash flow increases cash savings by 15.81 cents, evaluated at the 75th percentile [0.005] of net loans and with the other

variables in the model held constant.[5] Moreover, this result has economic significance. The effect of a single standard deviation change in net loans increases the cash flow sensitivity of cash by 63% in absolute magnitude (0.2221 cents relative to the mean effect of 0.1362).[6]

Consistent with H1, this result suggests that the cash flow sensitivity of cash increases with the levels of net loans to related companies. In other words, firms that provide loans to related companies (i.e., positive net loans) have a greater propensity to save cash from cash flows, while firms that receive loans from related parties (i.e., negative net loans) have a lower cash flow sensitivity of cash.

In all of the models, we find that some control variables show meaningful results. Consistent with the literature, we control for change in short-term debt, change in net working capital, and the level of external leverage. The change in net working capital is positivity associated with cash savings suggesting that short-term investment increases managers' incentives to save more cash. Changes in short-term debt and past external debt are also found to be positive significant influences of cash savings implying that higher levels of debt will require more savings of cash to pay debt down. We also control for capital expenditures as investment activities at the beginning of the year can generate internal funds during the year allowing firms to save cash (Boubaker et al., 2014). However, they exhibit insignificant coefficients. We also control for growth opportunities and a firm's size using Tobin's Q and

[5] In particular, the calculations of this marginal effect is:

$\frac{\partial[\Delta CashHoldings]}{\partial CashFlow} = 0.1497 + 1.6852 \times 0.005 = 0.1581$, where $\Delta CashFlows = 1$, and the P75 of net loans is 0.005.

[6] Based on the mean value of *NetLoans* (-0.008 in Table 1), the sensitivity to cash of an additional Chilean Peso (CLP) of cash flow is 0.1362 [= 0.1497+1.6852*(-0.008)]. A one standard deviation increase in *NetLoans* (0.051 in Table 1) brings about a marginal cash flow sensitivity of cash of 0.0859 (= 1.6852*0.051) or 70% higher implying that an additional CLP of cash flow increases cash savings to 0.2303 CLP with the other variables in the model held constant.

the natural log of total assets. It is important to control for Tobin's *Q* as, roughly speaking, this variable capitalizes the value to the firm holding cash (Riddick and Whited, 2009). However, coefficients associated with these variables are also statistically insignificant across all of the specifications.

Finally, as a robustness check, we include a firm fixed effects regression for the full model (Column 5) to control for unobserved firm heterogeneity in cash holdings as identification test. The results of the interaction of cash flow times net loans holds in its direction (positive) and magnitude. However, the specification test for the pooled vs. the fixed effects model does not reject the null that the presence of individual effects is different from zero (F=1.10, p-value=0.2436) suggesting that a pooled OLS estimation is the correct model specification.

Insert Table 4 about here.

4.2 The Effects of Ownership Structure and Financial Constraints

This section evaluates the effects of different ownership structures on the relationship between intra-group loans and the cash flow sensitivity of cash. To perform these tests, we split our sample into groups to test whether the relationship among intra-group loans and the cash flow sensitivity of cash is driven by business group affiliation, family control, control-enhancing mechanisms, and the presence of financial constraints.

We begin by testing the effect of internal capital markets on the cash flow sensitivity of cash with respect to those firms with greater access to inter-corporate funding. The sample is divided by whether the firm is affiliated with business groups or is a standalone company.[7] Empirical evidence suggests that affiliation with a business group can be beneficial due to

[7] Due to multicollinearity and interpretability issues with the three-way interaction terms in the discrete choice models (Moosbrugger et al., 2009), we perform an alternative estimation that avoids the net loans and operating cash flow interaction by directly subsampling on business groups and standalone companies. We perform the same subsampling procedure in subsequent analysis.

the group's tendency to avoid financial friction through the use of internal capital markets (Buchuk et al., 2014; Silva et al. 2006).

When defining business group affiliation, this study follows the definition used by the Chilean financial regulator. The SVS maintains a list of business groups in the country. According to the Chilean Capital Markets Law, a firm belongs to a business group if it meets any of the following conditions: 1) the firm has the same controller as other firms and the controller holds at least 25% of direct ownership, 2) a significant portion of the firm's assets are assigned to business groups, or 3) the firm is controlled by one or more firms that belong to a business group controlled by an ultimate shareholder.[8] The SVS website periodically provides a list of firms that are affiliated with each business group.[9]

We compare the coefficients of the interaction *Cash Flow* times *Net Loan* across the two groups using pooled OLS estimations. The expected effect is that the regression coefficient for the interaction term will be significantly higher for firms affiliated with business groups than for standalone companies. Table 5 summarizes the cross-sectional tests by business group affiliation status [Columns (1) and (2)]. The results indicate the effect of net loans on cash flow sensitivity is only statistically significant for the subsample of affiliated firms (B=1.833, t=2.63). This finding result supports the hypothesis that firms have different levels of response to their cash holdings when they have better access to internal capital markets. More importantly, this finding suggests another previously unexplored side of the effects of internal capital markets on business groups. Firms with access to intra-group funding do not need to save as much cash from cash flows as firms with no access to internal capital markets.

Regarding the criteria for family ownership, prior evidence has shown that family firms

[8] Law n. 18,045 – Title XV, pp. 39-44.
[9] http://www.svs.cl/sitio/mercados/grupos.php (accessed in October, 2015).

use intra-group transactions to access funds needed for financing (Ang et al., 2015; Chen et al., 2015). The expected effect is that family firms have greater access to internal capital markets with family holding groups. To define a family-owned firm, we use control chain methodology to identify the ultimate family or family group shareholder of the pyramidal structure. That is, the shareholder who effectively controls the firm (La Porta et al., 1999, Claessens et al., 2000; Ruiz Mallorquí and Santana Martín, 2011). In this process, we follow the weakest link and direct participation to compute voting rights. Cash flow rights are computed as the multiplication of indirect participation. We then sum the direct participation. Additionally, following Villalonga and Amit (2006) and Bonilla et al. (2010), we use three criteria to determine whether a firm is a family business. First, if annual reports explicitly state the existence of a controlling shareholder and the chain of control indicates that the ultimate controlling shareholder is a group of individuals of the same family, the firm is categorized as a family-controlled firm. In addition, if annual reports do not explicitly state the existence of a controlling shareholder, we categorize a firm as family-controlled if the board of directors is majority controlled by members who are relatives of the ultimate family owner. Finally, we categorize a firm as family-controlled if the firm is run at the senior management level by one or more family members related to the ultimate family owner (Block, 2011; Vandekerkhof et al., 2015).

Columns (3) and (4) of Table 5 provide the regression results for non-family and family firms, respectively. The results indicate that the coefficient for the interaction term between *Cash Flow* and *Net Loans* is statistically significant for both groups. The marginal effect is higher for family firms at levels of net loans above the 90th percentile. Below that point, non-family firm's exhibit higher marginal effects (see also Figure 1). Overall, the results in consistently show that the coefficient for the interaction between *Cash Flow* and *Net Loans*

is significantly higher for the group of firms that have better access to internal capital markets (i.e., firms affiliated with business groups and family-owned firms). However, firms that provide financing to related companies must maintain greater cash flow sensitivity of cash to prevent higher levels of pressure on their cash holdings.

Insert Table 5 about here.

The next step in the empirical cross tests is to analyze the effects of financial constraints and the relationship between intra-group loans on the cash flow sensitivity of cash. Our second hypothesis states that greater cash flow sensitivity of cash should be observed among financially constrained firms with high levels of net loans.

In this regard, Almeida et al. (2004) predict that firms that suffer from financing constraints have an incentive to build-up a cash buffer to finance future investment opportunities, while firms that have no financing constraints do not have that incentive. Consequently, we expect firm characteristics that indicate a firm's exposure to financing constraints to be positively related to the propensity to save cash out of cash flows, especially when they are net providers of funds to related companies. Thus, we identify two variables that have been used in prior studies as indicators as to the likelihood of suffering from financing constraints. First, we use the index of financial constraint developed by Kaplan and Zingales (1997). The KZ Index is an indicator of a firm's reliance of internal funding.[10] Higher values of the KZ Index indicate that firms are more financially constrained. In addition, we follow Fazzari et al. (1988) and Han and Qiu (2007) and use the dividend payout

[10] The KZ Index, as reported by Lamont et al. (2001), is calculated as follows: -1.002(Cash Flow / PPE) + 0.283(Tobin's Q) + 3.139(Debt / Capital) − 39.368(Div. / PPE) − 1.315(Cash / PPE), where PPE is property, plant, and equipment and Capital is the market capitalization plus total debt.

rate as a proxy for financial constraints. Dividend payouts are unlikely when firms face severe external financing constraints.

Table 6 presents the results when we split the sample into firms with a "high" or "low" likelihood of being financially constrained. We separate firms into those with high and low financial constraints based on values above and below the 50th percentile for our two financial constraints proxies. We then compare the coefficients of the interaction terms between *Cash Flow* and *Net Loans* across the two groups.

The increased marginal effect of net loans to the cash flow sensitivity of cash is statistically significant for both of our proxies for financial constrained firms. Columns (1) and (2) in the table present the multivariate results when we split the sample using the KZ Index. The slope of the marginal effect, as an increasing function of net loans, is larger for the subsample with high KZ Index values when compared with the coefficient for the interaction effect for the low KZ Index subsample. The marginal effect of an additional CLP 1 of operating cash flow for the sample of firms with a high KZ Index evaluated above the 20th percentile of net loans distribution is 0.17 cents, while below that point, the size effect is higher for low constrained firms. Columns (3) and (4) in the table split the sample into firms with high and low dividend payouts. The marginal effect of intra-group lending using the criteria of dividend payout is only statistically significant for the low dividend payout firms, who are more likely to be financially constrained (see also Figure 1).

The above findings indicate that firms with high financial constraints are associated with significantly higher cash flow sensitivity of cash at high levels of net loans to related companies. Consistent with H2, these findings suggest that firms with high net loans need to save more cash from cash flows in the presence of significant external financial constraints.

Insert Table 6 about here.

4.3 The Effect of Excess of Control Rights

This section analyzes the effects of excess of control rights and ownership concentration on the relationship between intra-group loans and the cash flow sensitivity of cash. Shareholders commonly extract private benefits using control-enhancing mechanisms, such as business group affiliation or the issuance of non-voting shares (La Porta, et al., 1999). The use of control-enhancing mechanisms, such as pyramidal ownership, usually results in a disproportionality between the voting rights and the cash flow rights of the ultimate controlling shareholder (Faccio and Lang, 2002).[11] The literature suggests that the effectiveness of different mechanisms to retain control depends upon the context in which they are used (Adams and Ferreira, 2008; Cronqvist, et. al., 2012). Some studies argue excessive voting rights provide incentives to controlling shareholders to extract private benefits and engage in tunneling activities, which could be more pronounced within family firms (Greco et al., 2015; Sacristán-Navarro et al., 2011; Singal and Singal, 2011).

The empirical evidence from Chile suggests that business group affiliation is beneficial for firm financial decisions due to the group's tendency to avoid financial friction through the use of internal capital markets (Buchuk et al., 2014; Silva et al., 2006). Consequently, in the context of cash-holding policies, we expect the degree to which firms use control-enhancing mechanisms and intra-group loans influence the propensity of firms to save cash from cash flows. Controlling shareholders can exacerbate the use intra-group corporate loans to extract funds. As such, they will need to increase the cash flow sensitivity of cash in order to meet the cash needed to tunnel funds to related companies. H3 states that the cash flow sensitivity of cash will be the strongest at higher levels of separation between

[11] We use "pyramidal ownership," "control-enhancing mechanism," "separation of voting and cash flow rights," or "excess of control rights" interchangeably.

voting rights and cash flow rights.[12]

Table 7 displays the main results. The regression estimates indicate that the marginal effects for interacting the product of cash flow times net loans is statistically significant and structural higher, more than three times higher, for the "low" excess control rights group compared to the "high" excess control firms. The estimated coefficients are 1.445 (t =1.92) for the low group vs. 0.62 (t = 0.95) for the high excess control group as displayed in the regressions in Columns (1) and (2). These findings suggest that the effects of internal capital markets on the propensity of firms to save cash from cash flows are not driven by tunneling concerns.[13]

This analysis is extended by looking at the effect of net loans on the cash flow sensitivity of cash by including two additional cross-sectional tests based on two proxies of blockholder contestability. The first proxy is the ratio of the sum of equity rights from the second to the fourth largest blockholder relative to the equity rights of the first largest blockholder. When this ratio is greater than one, it indicates that the voting power of the largest blockholder is effectively controlled by the voting power of the next largest shareholders as none of them individually has absolute control (Jara-Bertin et al., 2008).

The second proxy is the Herfindahl differences that measure blockholder voting power dispersion. This index tends toward zero as long as blockholders' equity shares are more equally distributed (Maury and Pajuste, 2005). Thus, higher Herfindahl differences indicate lower blockholder contestability. These two variables seek to capture the actual contest for

[12] Moreover, the literature indicates that firms with excess of control rights restrict the use of debt to avoid the monitoring role of creditors, which can limit the ability of owners to enjoy the private benefits of control (Volpin, 2002), such as tunneling funds to related companies. Thus, the fact that controlling shareholders restrict the use of external debt to preserve their ability to extract benefits from control may lead them to save more cash from cash flows.

[13] We split the sample for firms that are above and below the 50th percentile for the percentage of excess control rights of the ultimate large shareholder.

corporate control that the largest blockholder faces when they are unable to control the company directly.

The results are displayed in Columns (3)-(6) in Table 7. For both indicators, in the group ranked as low contestability, the cash flow sensitivity of cash is an increasing function of net intra-group loans with a size effect 1.73 and 1.59 times greater and statistically significant at the 5% and 1% level, respectively. This result complements the previous analysis in the sense that absolute control by the largest shareholder implies low separation between ownership and control, more discretionary power to the controlling shareholders as providers of intra-group loans, and lower agency costs (management vs. ownership) associated with those liquidity transfers. To the extent that the increase in cash flow sensitivity of cash in the presence of high net loans to related companies is driven only by firms with low contestability of control indicates that we cannot rule out the possibility that the private benefits that accrue to the controlling shareholders and agency costs (controlling shareholder vs. minority shareholders) may be an important consideration in the relationship between inter-corporate loans and the cash flow sensitivity of cash. However, a previous study by Buchuk et al. (2014) finds no evidence of tunneling through intra-group loans in Chile. The authors argue that the degree of transparency with which related loans are reported in the financial statements, regulations requiring related-party transactions to be made at market rates, and corporate governance policies overseeing related party transactions make tunneling through intra-group loans much harder in Chile than in other countries.

Insert Table 7 about here.

Finally, for illustrative purposes, Figure 1 reports the estimated marginal effects of net loans on the propensity of firms to save cash from cash flows. The upper left plot indicates the cash flow sensitivity of cash of firms using the full sample (results presented in Table 4)

is a positive function of net loans. However, we do not find a significant negative effect for companies receiving net loans, as the effect is statistically significantly negative at sufficiently low values of net loans.

The remaining panels in Figure 1 describe the marginal effects of cash flow sensitivity of cash as an increasing function of intra-group loans by splitting the sample into business group affiliation, family control (Table 5), the degree of financial constraints (Table 6), and the separation of ownership and control (Table 7). These plots confirm that the conditional impact of net loans is the strongest for firms affiliated with business groups and family-owned firms. The figure also indicates that providers of funds that have high saving propensity are those firms that are more financially constrained. Finally, base in excess of control rights, who do not find evidence of tunneling through intra-group loans. In fact, we find the opposite to be true. Companies with low excess of control rights make the highest loans to related firms.

Insert Figure 1 about here.

4.4 Robustness Checks

To address endogeneity concerns that arise from the fact that relationships among changes in cash holdings are likely to be dynamic, we also estimate a dynamic panel specification. In this case, the appropriate empirical model should be a dynamic model of the form:

$$\begin{aligned}\Delta\, CashHoldings_{it} &= \alpha + \beta_1\, \Delta\, CashHoldings_{it-1} + \beta_2 CashFlow_{it} + \beta_3 Net\ Loans_{it} \\ &+ \beta_4 CashFlow_t \times Net\ Loans_{it} + \gamma' X_{it} + Year_t + I_i + \epsilon_{it},\end{aligned} \tag{2}$$

where all variables are as previously defined. The problem in Equation (2) is that $\Delta CashHoldings_{it-1}$ is endogenous to the fixed effects terms, which is absorbed by the error term causing an endogeneity bias. To alleviate this endogeneity concern, we apply the

dynamic Generalizing Methods of Moments (GMM) estimator to the panel of firms to estimate the relationship between intra-group loans on the cash flow sensitivity of cash. We introduce all right hand side variables lagged from *t*-2 to *t*-4 in the estimating cash equation.[14]

Table 8 reports the results for the dynamic panel GMM regressions. The coefficients for the interaction terms between cash flow and net loans are consistently positive and statistically significant across all of the specifications controlling for other known determinants of cash holdings. These results indicate that when correcting for the endogeneity bias, the relationships between intra-group loans and the cash flow sensitivity of cash remain consistent with the pooled and fixed effects estimates. Regarding the instruments validity tests, the consistency of the GMM estimates depends upon the absence of second order serial autocorrelation in the residuals and on the validity of the instruments (Arellano and Bond, 1991). The Hansen test of over-identifying constraints tests for the absence of correlation between the instruments and the error term and, as such, checks the validity of the selected instruments. The results indicate that the GMM results pass the requirements regarding autocorrelation and instruments validity as the tests do not reject either the null hypothesis of absence of second order autocorrelation or the null hypothesis of validity of the instruments (e.g., Hansen tests).

Insert Table 8 about here.

5. Conclusions

This article examines how internal capital markets affect the propensity of firms to save cash from cash flows (i.e., the cash flow sensitivity of cash). We benefit from regulations of Chile's internal capital markets that require every listed firm to report a line called "notes

[14] We estimate the dynamic GMM regressions following the command developed by Roodman (2009). We consider all variables as endogenous and we instrument them using up to five lags.

and accounts payable from related companies" on both the liability and the asset side of the balance sheet. These accounts allow us to precisely measure the use of internal capital through intra-group net loans.

The main findings stress that the level of intra-group loans is positively and significantly related to a firm's cash flow sensitivity of cash. This outcome is consistent with the hypothesis that if firms are providing loans to related parties, implying that they are increasing their investments on the difference between accounts receivable and accounts payable and, therefore, are affecting their cash flows, then these firms will be more prone to increase their level of cash to avoid high levels of pressure on their cash holdings and possible financial distress.

Additional analysis indicates that firms with high levels of net loans and high levels of financial constraints are also those firms with significantly higher cash flow sensitivity of cash. This evidence seems to suggest that managers of financially constrained firms that provide loans to related companies are more committed to save cash from cash flows than unconstrained firms. Nonetheless, we do not find evidence consistent with the hypothesis that firms save more cash due to tunneling money through intra-group loans when the controlling shareholder has high excess of control rights. As the positive association between intra-group loans and the cash flow sensitivity of cash may suffer from endogeneity concerns, we apply a dynamic GMM estimator to the panel of firms to estimate the relationship between the cash flow sensitivity of cash and net loans. After this robustness check, our results still hold.

Overall, our analysis extends and identifies another role that internal capital markets play in corporate finance. More importantly, we shed light on the effects that intra-group loans represent as an additional determinant of firms' cash holdings, and how the degree of

financial constraints can be significantly diminished by the cash saving behaviors of related firms.

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Table 1. Summary Statistics for Key Variables

This table reports summary statistics for the dependent and independent variables used in this study. The sample is comprised of 105 companies listed in the Santiago Stock Exchange from 1999-2014 (1,268 observations). All of the variables are defined in the appendix.

Variable	N	Mean	P50	SD	Min	Max	P25	P75
Cash Holdings	1243	0.091	0.044	0.169	0.000	2.184	0.015	0.101
ΔCash Holdings	1242	0.000	0.000	0.065	-0.370	0.325	-0.013	0.015
Cash Flow	1245	0.073	0.068	0.086	-0.166	0.524	0.029	0.110
Net Loans	1186	-0.008	0.000	0.051	-0.379	0.104	-0.007	0.005
Capex	1256	0.052	0.041	0.047	0.000	0.269	0.020	0.067
Family (1/0)	1268	0.623	1.000	0.485	0.000	1.000	0.000	1.000
Business Group (1/0)	1268	0.690	1.000	0.463	0.000	1.000	0.000	1.000
Size	1268	26.087	26.097	1.884	20.224	31.103	24.652	27.531
Tobin's Q	1244	0.999	0.845	0.630	0.214	6.158	0.637	1.216
ROA	1244	0.046	0.040	0.068	-0.266	0.488	0.015	0.074
Voting Rights	1268	0.582	0.581	0.213	0.010	0.998	0.443	0.756
Cash Flow Rights	1244	0.494	0.449	0.232	0.084	0.991	0.325	0.670
Excess Control Rights	1247	0.088	0.000	0.134	0.000	0.579	0.000	0.144
NWK	1243	0.125	0.103	0.139	-0.175	0.616	0.023	0.212
STD	1255	0.069	0.049	0.073	0.000	0.372	0.013	0.095
External Debt	1210	0.245	0.250	0.173	-0.372	1.857	0.136	0.341
Contest Index	1258	0.273	0.262	0.175	0.000	1.487	0.142	0.348
Herfindalh Diff. Index	1247	0.202	0.121	0.233	0.000	0.999	0.029	0.274
Kaplan-Zingales Index	1197	-39.670	-1.066	492.589	-11617.7	3.069	-3.943	0.423
Dividends	1246	0.506	0.399	0.904	-4.821	6.480	0.051	0.766

Source: Own estimates based on Thomson's Eikon, Economatica, World Scope platforms, and SVS firm financial notes and annual reports

Table 2. Distribution of the Sample by Year and Industry

This table reports the distribution of the sample and mean net loans to related companies categorized by year and industry. Panel A presents the number of sample firms categorized by year. Panel B provides the number of sample firms categorized by industry. We only consider firms listed in the Santiago Stock Exchange. Net Loans are defined as the difference between accounts receivable and accounts payable from related companies.

Panel A: Distribution of the Sample by Year

Year	# Observations	Net Loans / Total Assets
1999	29	-2.30%
2000	32	-1.00%
2001	34	-1.06%
2002	38	-1.37%
2003	39	-1.71%
2004	84	-0.98%
2005	93	-0.84%
2006	98	-1.24%
2007	102	-1.50%
2008	102	-0.34%
2009	103	-0.52%
2010	103	-0.39%
2011	103	-0.44%
2012	103	-0.03%
2013	103	-0.34%
2014	102	-0.79%
Total	1268	-0.77%

Panel B: Distribution of the Sample by Industry

Industry	# Observations	# Firms	Net Loans / Total Assets
Basic Materials	233	21	-0.16%
Consumer Cyclicals	145	14	-0.22%
Consumer Non-Cyclicals	272	23	-0.07%
Energy	26	2	-6.39%
Financials	37	3	-1.45%
Healthcare	22	2	0.48%
Industrials	270	22	0.23%
Telecommunications Services	64	5	0.11%
Utilities	199	17	-3.71%
Total	1268	109	-0.77%

Source: Own estimates based on Thomson's Eikon, Economatica, World Scope platforms, and SVS firm financial notes and annual reports.

Table 3. Univariate Analysis.

This table provides the univariate results regarding the relation among the change in cash holdings, net loans, and cash flows. The sample is partitioned into low and high net loan groups based on the fifth and first quartiles of net loans (defined as the difference between accounts receivable and accounts payable from related companies, all over total assets), respectively, and into low and high cash flows, also based on the fifth and first quartiles of operating cash flow. Panel A presents the mean differences and t-tests. Panel B reports the median differences and Wilcoxon rank-sum test, which is also known as the Mann-Whitney two-sample statistic. ***, **, and ** indicate the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Panel A: Mean Change in Cash Holdings (%) Categorized by Net Loans and Cash Flows

		All Firms	Low Cash Flow	High Cash Flow	High-Low
Low Net Loans	**Mean**	**-0.3224**	**-0.6059**	**-0.8698**	**-0.26390**
	N	228	53	53	
High Net Loans	**Mean**	**-0.1943**	**-2.9292**	**2.6156**	**5.5447*** **
	N	233	35	37	
High-Low		**0.1281**	**-2.3233***	**3.4854****	

Panel B: Median Change in Cash Holdings Categorized by Net Loans and Cash Flows

		All Firms	Low Cash Flow	High Cash Flow	High-Low
Low Net Loans	**Median**	**0.0000**	**-0.3529**	**0.0074**	**0.3603****
	N	228	53	53	
High Net Loans	**Median**	**0.0000**	**-0.2678**	**0.516**	**0.7839*** **
	N	233	35	37	
High-Low		**0.0000**	**0.0850**	**0.5086***	

Table 4. The Effects of Intra-Groups Loans on Cash Flow Sensitivity of Cash

Columns (1)-(4) of this table present the parameter estimates from ordinary least squares (OLS) regressions of the following model:

$$\Delta CashHoldings_{it} = \alpha + \beta_1 CashFlow_{it} + \beta_2 NetLoans_{it} + \beta_3 CashFlow_{it} * NetLoans_{it} + \gamma' X_{it-1} + yaer_t + I_i + \epsilon_{it},$$

Where: the dependent variable, *ΔCashHoldings*, is the change in the level of *CashHoldings* from year *t*-1 to year *t*. *CashHoldings* is cash and marketable securities scaled by total assets. *CashFlow* is cash flow from operations, calculated as cash flow from operating activities, all divided by total assets. Net loans is equal to Total Accounts Receivable Related Parties minus Total Accounts Payable Related Parties to total Assets. The definition of all control variables in vector $\mathbf{X}_{i,t-1}$ are displayed in Appendix A; L means the first lag of variable x_i ; D means delta/change from year t-1 to year t.

Dependent Variable: ΔCash Holdings	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
CashFlow	0.1103***	0.1248***	0.1409***	0.1497***	0.2451***
	(3.9201)	(3.7543)	(4.4127)	(4.6650)	(7.8447)
NetLoans		-0.1361**	-0.1323**	-0.0838	-0.1364*
		(2.1875)	(1.9904)	(1.1610)	(1.8287)
CashFlow*NetLoans		**1.8911****	**1.8037*****	**1.6852****	**1.5650****
		(2.3502)	**(2.6635)**	**(2.4985)**	**(2.5657)**
L.Tobin's Q		-0.0026	-0.0038	-0.0041	-0.0057
		(0.6864)	(1.1054)	(1.1900)	(1.0551)
L.Size		-0.0002	0.0007	-0.0001	-0.0046
		(0.1567)	(0.8781)	(0.0926)	(0.8364)
L. CAPEX			0.0417	0.0268	0.0768
			(0.9282)	(0.5947)	(1.3583)
D.NWK			0.5673***	0.5630***	0.5604***
			(10.7558)	(10.7450)	(19.0428)
D.STD			0.4298***	0.4359***	0.4790***
			(7.2184)	(7.3731)	(10.6001)
L.ExternalLeverage				0.0376**	0.0674***
				(2.4155)	(2.8064)
Constant	0.0095	-0.0213	-0.0493*	-0.0379	0.0600
	(0.7324)	(0.6975)	(1.8661)	(1.4470)	(0.4289)
Year Fixed-effects	Yes	Yes	Yes	Yes	Yes
Industry Fixed-effects	Yes	Yes	Yes	Yes	No
Firm Fixed-effects	No	No	No	No	Yes
Observations	1222	1023	987	983	983
Adj. R2	0.0486	0.0524	0.3321	0.3367	0.3648
F test that all u_i=0 (p-value)					1.10 (0.2436)

Notes: Regression includes both year (T_i) and industry fixed-effects (I_i). Variables defined as ratios are all winsorized at the 1% and 99% levels. All variables are defined in the appendix. L The t-values in parentheses are computed with robust standard errors. Column (5) reports the results from a firm-fixed effects model to control for unobserved firm heterogeneity in cash holdings. ***, **, and * indicate the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Table 5. The Effects of Intra-Groups Loans on Cash Flow Sensitivity of Cash Categorized by Ownership Structure

This table presents the parameter estimates from ordinary least squares (OLS) regressions of the following model for different subsamples of firms:

$$\Delta CashHoldings_{it} = \alpha + \beta_1 CashFlow_{it} + \beta_2 NetLoans_{it} + \beta_3 CashFlow_{it} * NetLoans_{it} + \gamma' X_{it-1} + year_t + I_i + \epsilon_{it},$$

Where all variables are defined in the appendix A. L means the first lag of variable x_i ; D means delta/change from year t-1 to year t.

Dependent Variable: ΔCash Holdings	Non-BG Member	BG Member	Non-Family Firms	Family Firm
	(1)	**(2)**	**(3)**	**(4)**
CashFlow	0.1626***	0.1548***	0.1893***	0.1322***
	(3.2632)	(3.4261)	(3.5684)	(3.1453)
NetLoans	0.1376	-0.1209*	-0.0882	-0.2634*
	(0.4965)	(1.7330)	(1.0648)	(1.7922)
CashFlow*NetLoans	**0.2125**	**1.8337*** **	**1.6210** **	**3.8416** **
	(0.1031)	**(2.6306)**	**(2.1335)**	**(2.0311)**
L.Tobin's Q	-0.0040	-0.0043	-0.0027	-0.0024
	(0.3546)	(1.1815)	(0.3396)	(0.5866)
L.Size	-0.0036	0.0011	0.0016	-0.0012
	(1.2708)	(1.1298)	(0.8958)	(0.9408)
L. CAPEX	-0.0092	0.0170	0.0545	0.0021
	(0.1311)	(0.2847)	(0.5952)	(0.0397)
D.NWK	0.7026***	0.5131***	0.5350***	0.5851***
	(7.7390)	(8.0240)	(6.5353)	(8.2108)
D.STD	0.4744***	0.4183***	0.4186***	0.4541***
	(4.7857)	(5.5336)	(4.3783)	(5.9005)
L.ExternalLeverage	0.0812**	0.0223	0.0404	0.0445**
	(2.2693)	(1.1627)	(1.6358)	(2.0552)
Constant	0.0298	-0.0606	-0.0814	-0.0134
	(0.4704)	(1.6226)	(1.4044)	(0.4104)
Year Fixed-effects	Yes	Yes	Yes	Yes
Industry Fixed-effects	Yes	Yes	Yes	Yes
Observations	288	695	350	633
Adj. R2	0.4193	0.3040	0.3222	0.3369

Notes: The sample is divided based on whether the firm is affiliated with business groups or it is a stand-alone company. To define the business group affiliation, we inspect the list of business groups provided by the *Superintendencia de Valores y Seguros* (SVS). The sample is also broken into family and non-family firms according to three criteria. First, if the annual reports explicitly state the existence of a controlling shareholder and the chain of control indicates that the ultimate controlling shareholder is a group of individuals of the same family, the firm is categorized as a family-controlled firm. In addition, if the annual reports do not explicitly state the existence of a controlling shareholder, we categorize a firm as family-controlled if the board of directors is majority controlled by members who are family related to the ultimate family owner. Finally, we categorize a firm as family-controlled if the firm is run at the senior management level by one or more family members related to the ultimate family owner. We include fixed effects at the industry and year levels. The t-values in parentheses are computed with robust standard errors. ***, **, and * indicate the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Table 6. The Effects of Intra-Groups Loans on Cash Flow Sensitivity of Cash Categorized by Ownership Structure

This table presents the parameter estimates from ordinary least squares (OLS) regressions of the following model for different subsamples of firms:

$$\Delta CashHoldings_{it} = \alpha + \beta_1 CashFlow_{it} + \beta_2 NetLoans_{it} + \beta_3 CashFlow_{it} * NetLoans_{it} + \gamma' X_{it-1} + year_t + I_i + \epsilon_{it},$$

Where all variables are defined in the appendix A. L means the first lag of variable x_i ; D means delta/change from year t-1 to year t.

Dependent Variable: ΔCash Holdings	Low KZ	High KZ	High Dividend Payout	Low Dividend Payout
	(1)	**(2)**	**(3)**	**(4)**
CashFlow	0.1670***	0.2230***	0.0795**	0.2621***
	(3.9021)	(4.1775)	(2.1566)	(5.0139)
NetLoans	-0.1155	-0.0998	-0.0345	-0.0945
	(1.3772)	(0.8745)	(0.3516)	(0.7849)
CashFlow*NetLoans	**1.8257****	**2.9219***	**1.0240**	**2.7215****
	(2.4693)	**(1.8867)**	**(1.0775)**	**(2.1065)**
L.Tobin's Q	0.0014	-0.0103*	-0.0022	-0.0020
	(0.2400)	(1.8340)	(0.5390)	(0.3466)
L.Size	0.0018	-0.0017	0.0020*	-0.0024*
	(1.1489)	(1.3799)	(1.7398)	(1.7342)
L. CAPEX	-0.1034	0.0889	-0.0149	0.0678
	(1.4482)	(1.5322)	(0.3164)	(0.9887)
D.NWK	0.7022***	0.3910***	0.6003***	0.4903***
	(10.2227)	(5.2648)	(8.5677)	(6.7747)
D.STD	0.5148***	0.3528***	0.5310***	0.3842***
	(6.2354)	(4.3880)	(5.9194)	(4.6423)
L.ExternalLeverage	0.0407*	0.0231	0.0297	0.0314
	(1.8152)	(0.9794)	(1.5011)	(1.3379)
Constant	-0.1003**	0.0133	-0.0933**	0.0148
	(2.2809)	(0.4522)	(2.1524)	(0.4324)
Year Fixed-effects	Yes	Yes	Yes	Yes
Industry Fixed-effects	Yes	Yes	Yes	Yes
Observations	472	474	463	502
Adj. R2	0.4227	0.2619	0.3191	0.3522

Notes: We separate our sample into firms with "high" and "low" likelihood of being financially constrained based on dividing firms into above and below-median values for the financial constraints proxies, respectively. We use the KZ index and dividend payout ratios as indicators for the likelihood of suffering from financing constraints. The KZ index, as reported by Lamont et al. (2001). We include fixed effects at the industry and year levels. The t-values in parentheses are computed with robust standard errors. ***, **, and * indicate the coefficient is significantly different from zero at the 1%, 5%, and 10% significant level, respectively.

Table 7. The Effects of Intra-Groups Loans on Cash Flow Sensitivity of Cash, Categorized by the Level of Excess of Control Rights.

Dependent Variable: ΔCash Holdings	Low Excess of Control	High Excess of Control	Low Contest Index	High Contest Index	Low Herfindahl Difference	High Herfindahl Difference
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
CashFlow	0.1779***	0.1326***	0.1708***	0.1647***	0.1678***	0.1651***
	(3.6868)	(3.2702)	(3.5399)	(3.7766)	(3.8910)	(3.0836)
NetLoans	-0.0741	-0.0220	-0.0595	-0.0590	-0.0348	-0.0578
	(0.6996)	(0.2395)	(0.5328)	(0.6671)	(0.3576)	(0.5105)
CashFlow*NetLoans	**1.4452***	**0.6208**	**1.7275****	**1.2459**	**1.0151**	**1.5928***
	(1.9235)	**(0.9474)**	**(1.9888)**	**(1.5226)**	**(1.1036)**	**(1.7576)**
L.Tobin's Q	-0.0094**	0.0002	-0.0098	0.0003	-0.0016	-0.0083
	(2.0679)	(0.0501)	(1.4817)	(0.0893)	(0.4612)	(1.0841)
L.Size	0.0004	-0.0007	0.0012	-0.0007	-0.0005	0.0014
	(0.3419)	(0.4790)	(0.9427)	(0.4745)	(0.3237)	(1.0410)
L. CAPEX	0.0375	-0.0256	0.0776	0.0054	0.0022	0.0614
	(0.5494)	(0.3830)	(1.0745)	(0.0876)	(0.0346)	(0.8965)
D.NWK	0.6848***	0.4687***	0.5709***	0.5855***	0.5515***	0.5852***
	(7.0671)	(7.6458)	(7.8372)	(7.6740)	(7.4007)	(8.0420)
D.STD	0.5181***	0.4027***	0.5855***	0.3380***	0.3193***	0.5605***
	(5.3236)	(5.1380)	(6.8772)	(4.2278)	(4.1366)	(6.0637)
L.ExternalLeverage	0.0413*	0.0201	0.0551**	0.0249	0.0172	0.0551**
	(1.8796)	(1.0381)	(2.0915)	(1.3070)	(0.8783)	(2.2794)
Constant	-0.0459	-0.0230	-0.0636	-0.0257	-0.0138	-0.0643*
	(1.2405)	(0.6280)	(1.3417)	(0.7424)	(0.3917)	(1.7626)
Year Fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	485	479	475	502	497	472
Adj. R2	0.3980	0.2808	0.3486	0.3340	0.3174	0.3465

Notes: This table separates the sample into firms with "high" and "low" levels of excess of control rights and ownership concentration based on dividing firms into above and below median values for different proxies for these concepts, respectively. L means the first lag of variable x_i ; D means delta/change from year t-1 to year t. The t-values in parentheses are computed with robust standard errors. ***, **, and * indicate the coefficient is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Table 8. Dynamic GMM regressions of The Effects of Intra-Groups Loans on Cash Flow Sensitivity of Cash

This table presents the parameter estimates from GMM regressions of the following dynamic model:

$$\Delta CashHoldings_{it} = \alpha + \beta_1 \Delta CashHoldings_{it-1} + \beta_2 CashFlow_{it} + \beta_3 Net\ Loans_{it} + \beta_4 CashFlow_t \times Net\ Loans_{it} + \gamma' X_{it} + year_t + I_i + \epsilon_{it},$$

Where all variables are defined in appendix A. L means the first lag of variable x_i ; L2 means the second lag of variable x_i ; D means delta/change from year t-1 to year t

Dependent Variable: ΔCash Holdings	**(1)**	**(2)**	**(3)**	**(4)**
L. D.Cash	-0.1286	-0.1742***	-0.3120***	-0.3269***
	(1.4461)	(4.1238)	(9.8420)	(10.9499)
L2. D.Cash	-0.0103	-0.0604**	-0.1559***	-0.1590***
	(0.1382)	(2.0270)	(7.3834)	(7.5719)
CashFlow	0.4051	0.4053***	0.3682***	0.3478***
	(1.3902)	(3.8141)	(5.0341)	(5.1372)
NetLoans		-0.4050**	-0.3078***	-0.3062**
		(2.5607)	(3.6507)	(2.3053)
CashFlow*NetLoans		**2.4863****	**2.7190*****	**2.2852*****
		(2.0562)	**(3.6821)**	**(3.0478)**
L.Tobin's Q		-0.0034	-0.0047	-0.0097
		(0.3551)	(0.5564)	(1.2485)
L.Size		0.0166*	0.0238***	0.0184**
		(1.7601)	(2.8654)	(2.5154)
L. CAPEX			-0.1925	-0.3478**
			(1.3621)	(2.5870)
D.NWK			0.4569***	0.4168***
			(5.6365)	(5.6336)
D.STD			0.3296***	0.2500***
			(3.5373)	(3.1320)
L.ExternalLeverage				-0.0266
				(0.4842)
Year Fixed-effects	Yes	Yes	Yes	Yes
Industry Fixed-effects	Yes	Yes	Yes	Yes
Observations	855	778	739	735
AR(1) (p-value)	0.0002	0.0000	0.0001	0.0000
AR(2) (p-value)	0.5169	0.1443	0.2550	0.2384
Hansen J (p-value)	0.2035	0.2119	0.6970	0.4939
Number of Instruments	21	37	49	53

Notes: GMM models include one lag of the dependent variable. Year and industry dummies are included in all specifications. The t-values are in parentheses. *, **, and *** indicate the coefficient is significantly different from zero at the 10%, 5%, and 1% levels, respectively. *AR*(1) and *AR*(2) are tests for first-order and second-order serial correlation in the first differenced residuals under the null of no serial correlation. The Hansen J test of over identification is under the null that all instruments are valid.

Appendix A. Variable Definitions

Variable	Definition
Operating Cash Flow	Cash Flow from Operating Activities / Total Assets, where cash flow from operating activities is taken from the first section of the statement of cash flows, which is calculated using the direct method.
Net Loans	(Total Accounts Receivable Related Parties – Total Accounts Payable Related Parties) / Total Assets.
Cash Holdings	(Cash + Short-term Investments) / Total Assets.
Δ Cash Holdings	(Cash Holdings – Lagged Cash Holdings) / Lagged Total Assets.
External Leverage	(Short-term Interest Bearing Liabilities + Long-term Financial Debt – Net Loans) / Total Assets.
Family	Dummy variable that is equal to one if one of the following three criteria is met: 1) the ultimate large shareholder is a family group or an individual investor; 2) the board of directors is majority controlled by members who are family relatives of the ultimate family owner; and 3) the firm is run at the senior management level by one or more family members related to the ultimate family owner. Otherwise, the variable is equal to zero.
Business Groups	Dummy variable that is equal to one if the firm belongs to a business group, according to the SVS's definition, and zero otherwise.
Voting Rights	Voting rights of the ultimate large shareholder estimated using weakest link methodology.
Cash Flow Rights	Cash flow rights of the ultimate large shareholder estimated by the sum of direct ownership plus the multiplication of indirect participation.
Excess Control Rights	(Voting Rights – Cash Flow Rights) of the ultimate large shareholder.
Size	Natural logarithm of total assets.
Dividend Payout	Cash Dividends / Net Income.
ROA	Income Before Extraordinary Items / Total Assets.
Tobin's Q	(Total Assets + Market Equity – Book Value of Equity) / Total Assets.
Tangibility	(Property, Plant, and Equipment) / Total Assets.
NWK	Net Working Capital = (Current Assets - Current Liabilities – Cash) / Total Assets.
STD	Short-term Interest Bearing Liabilities / Total Assets.
Herfindal Differences Index	Sum of squared differences between the ownerships of the four largest shareholders. Herfindal = $(sh1 - sh2)^2 + (sh2 - sh3)^2 + (sh3 - sh4)^2$, where sh1, sh2, sh3 and sh4 are the ownerships of the first, second, third, and fourth largest shareholders, respectively.
Contest Index	(sh2 + sh3 + sh4) / sh1, where sh1, sh2, sh3 and sh4 are the equity rights of the first, second, third and fourth largest shareholders, respectively.
Kaplan-Zingales Index	The KZ Index, as reported by Lamont et al. (2001), is calculated as −1.002(Cash Flow / PPE) + 0.283(Tobin's Q) + 3.139(Debt / Capital) − 39.368(Div. / PPE) − 1.315(Cash / PPE), where PPE is property, plant, and equipment and Capital is the market capitalization plus total debt.

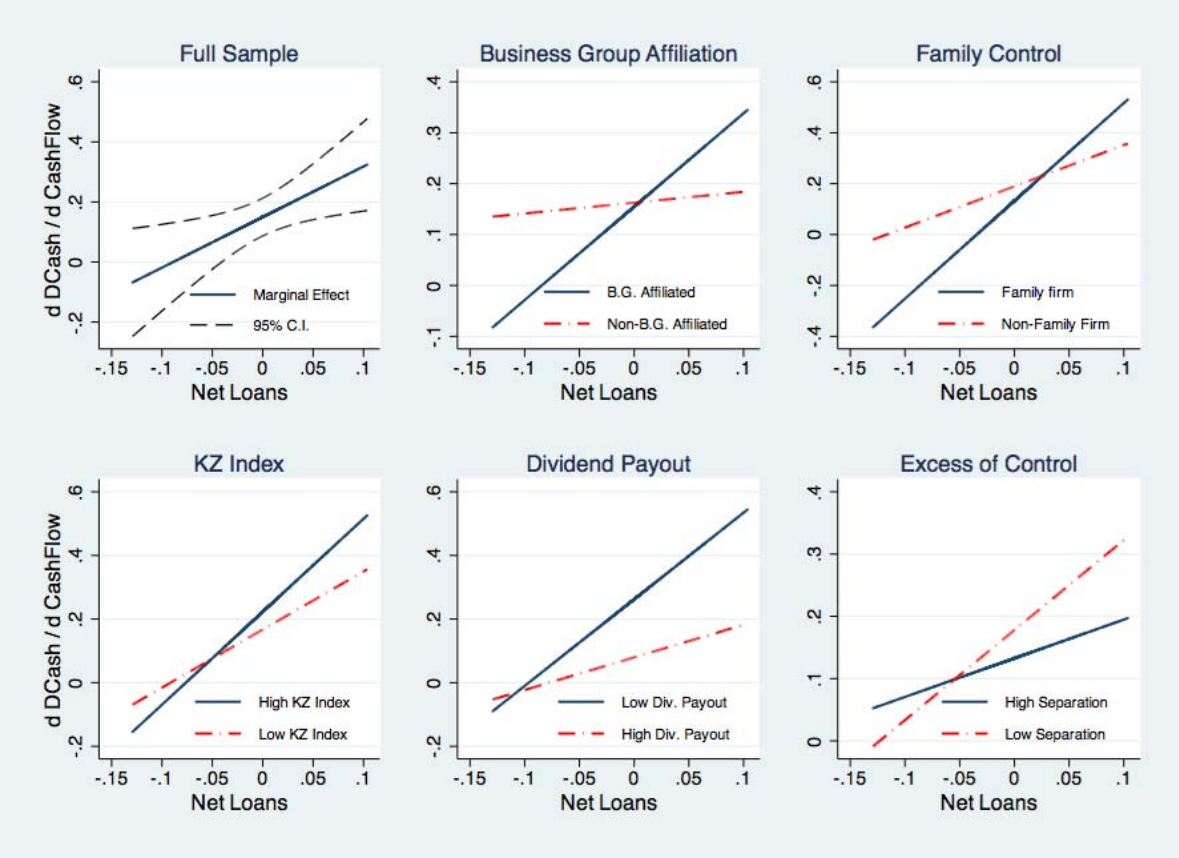
Appendix B. Means values for key variables by deciles based on net loans

Deciles based on Net Loans	1th	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
Net Loans	-0.117	-0.019	-0.007	-0.001	0.000	0.000	0.002	0.005	0.012	0.050
Cash Holdings	0.141	0.072	0.072	0.085	0.097	0.095	0.067	0.111	0.128	0.074
D. Cash Holdings	-0.004	-0.002	0.005	-0.002	0.006	-0.013	0.000	0.007	0.000	-0.004
Cash Flow	0.071	0.075	0.070	0.071	0.083	0.099	0.071	0.057	0.088	0.053
Capex	0.035	0.053	0.054	0.058	0.059	0.079	0.055	0.050	0.053	0.036
Size	25.402	26.161	26.570	27.208	24.580	27.813	26.668	26.743	25.887	25.429
Tobin's Q	0.966	0.986	0.976	1.013	1.181	0.931	1.000	0.889	0.875	1.029
ROA	0.055	0.038	0.036	0.038	0.059	0.042	0.050	0.037	0.043	0.049
Voting Rights	0.599	0.605	0.548	0.559	0.597	0.580	0.634	0.561	0.523	0.612
Cash Flow Rights	0.459	0.479	0.479	0.476	0.575	0.536	0.549	0.517	0.454	0.463
Excess Control Rights	0.124	0.129	0.075	0.079	0.022	0.050	0.078	0.064	0.088	0.123
NWK	0.050	0.135	0.117	0.132	0.098	0.129	0.109	0.153	0.149	0.170
STD	0.056	0.085	0.077	0.056	0.091	0.046	0.071	0.064	0.055	0.067
External Debt	0.329	0.291	0.271	0.279	0.221	0.271	0.233	0.233	0.181	0.141
Contest Index	0.276	0.281	0.276	0.246	0.289	0.252	0.267	0.254	0.264	0.308
Herfindalh Index Difference	0.332	0.218	0.176	0.195	0.153	0.169	0.153	0.174	0.167	0.241
Kaplan-Zingales Index	-14.453	-108.032	-2.279	-1.741	-10.806	-6.839	-79.397	-50.841	-98.503	-41.492
Dividend / Equity	0.449	0.344	0.611	0.412	0.442	0.810	0.431	0.450	0.789	0.449

Source: Own estimates based on Thomson's Eikon, Economatica, World Scope platforms, and SVS firm financial notes and annual reports.

Figure 1. Marginal Effects

This figure plots predicted firms' cash flow sensitives of cash as a function of their degree of net loans. For this illustration, we use the estimated coefficients in Column (4) of Table 4, the estimated coefficients in Table 5 and Table 6, and the estimated coefficients in Column (1) of Table 7. Net Loans is defined as the difference between the total amount of accounts receivable and the total amount of accounts payable from related companies reported by a firm on its balance sheet. Cash flow sensitives of cash are represented in this figure by d D.Cash / d CashFlow (partial derivate of the change in cash holdings with respect to operating cash flows). The upper left panel illustrates the marginal impact of net loans on the cash flow sensitivity of cash of firms using the full sample results. The remaining panels split the full sample into subsamples based on business group affiliation and family control status, the degree of financial constraints (measure by the KZ Index and dividend payout ratios), and the separation of ownership and control (represented by the excess of control rights of the ultimate large shareholder).



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