

# Ownership Concentration and the Determinants of Capital Structure in Latin America\*

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December 2008

## ABSTRACT

We study the capital structure determinants of Latin American firms using a comprehensive sample covering seven countries. We find that firms in the region have debt levels similar to those of U.S. firms, which is puzzling, given their low tax benefits and their higher bankruptcy costs. We argue that ownership-concentrated firms avoid issuing equity because they do not want to share control rights. Latin American firms have high ownership concentration, which creates an ideal setting to study how ownership concentration explains firms' capital structure. Consistent with the control argument, we find a positive relation between leverage and ownership concentration, when losing control becomes an issue. Also we show a positive relation between growth and leverage. In addition, we report that other determinants that do not proxy for control rights are consistent with previous finding: Firms that are larger, have more tangible assets, and are less profitable are also more leveraged.

JEL Classification Codes: G32, G15,

Keywords: Capital Structure, Ownership Control, Corporate Governance, Latin America.

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\* For helpful comments, we are grateful to Eduardo Pablo, Samuel Malone, Lorenzo Preve, and seminar participants at IESA-Venezuela, IAE-Argentina, the Universidad de los Andes-Colombia, the 2008 FMA annual meeting at Grapevine-Texas, and the 2007 BALAS annual conference at Bogota. The remaining errors are our sole responsibility. U.S. mailing address for all authors: IESA POBA INTL 646, PO Box 02-5255, Miami, FL 33102-5255. Fax +58-212-555.4446.

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## **ABSTRACT**

We study the capital structure determinants of Latin American firms using a comprehensive sample covering seven countries. We find that firms in the region have debt levels similar to those of U.S. firms, which is puzzling, given their low tax benefits and their higher bankruptcy costs. We argue that ownership-concentrated firms avoid issuing equity because they do not want to share control rights. Latin American firms have high ownership concentration, which creates an ideal setting to study how ownership concentration explains firms' capital structure. Consistent with the control argument, we find a positive relation between leverage and ownership concentration, when losing control becomes an issue. Also we show a positive relation between growth and leverage. In addition, we report that other determinants that do not proxy for control rights are consistent with previous finding: Firms that are larger, have more tangible assets, and are less profitable are also more leveraged.

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We argue that Latin American firms exhibit higher leverage than what is theoretically suggested by the trade-off theory of capital structure, because their ownership concentration is significantly higher to those of developed economies. In Latin America, stockholders of firms with highly concentrated ownership prefer to issue debt rather than equity because Latin American shareholders do not want to put firm control at risk. As shown in Chong and Lopez-de-Silanes (2007), larger information asymmetries and underdeveloped financial markets also make the issuance of equity less likely in the region.

There is a recent debate on how the benefits and costs of debt counterbalance each other to determine an equilibrium capital structure for companies in the United States. Graham (2000) argues that firms are less leveraged than they should be given the tax benefits of debt. Molina (2005), on the other hand, shows how costs of financial distress measured ex-ante can counterbalance the potential tax benefits that an average firm will obtain if it levers up.

In Latin America the situation may be quite different. La Porta, et al. (1997, 1998, 2000) report that the legal system that firms face differs significantly around the world, in part, because the countries' legal origin. They argue that investors are less protected in French Civil Law countries, compared to countries from the Common Law origin. All countries in Latin America have the same legal origin, which is French Civil Law. Chong and Lopez-de-Silanes (2007) show that in Latin America, which scores even worse than the average French Civil Law countries, investors' expropriation risk is more severe, the cost of capital is higher, firms pay less dividends, and, in general, the level of financial development in the region is very low.

In terms of the international debate of the optimal capital structure, the situation in Latin America offers interesting insights. First, tax benefits tend to be lower. In Chile, for example, corporate taxes can be deducted from equity personal taxes, reducing the corporate tax shield to possibly zero. In Mexico and Venezuela, required inflation adjustments on corporate financial statements can turn the tax shield negative in some cases. On the other hand, the costs of financial distress are presumably higher in Latin American than in the United States. In Latin America, bankruptcy and financial distress processes are longer, more bureaucratic, and more costly due in part to a worse rule of law (La Porta, et al., 1997).

If Latin American firms have on average fewer tax benefits and higher costs of financial distress than their U.S. counterparts, then, according to the trade-off theory of capital structure, we should expect them to be significantly less leveraged. In addition, Jensen (1986)'s argument that debt could act as an effective mechanism to monitor management, do not apply to Latin American firms. In Latin America the typical CEO is, or is related to, one of the firm's main-controlling shareholders. According to Johnston (2004), only two shareholders hold more than 50% of the firms' equity ownership.<sup>1</sup>

There are other reasons for firms in Latin America to hold lower debt levels. Financial markets are less developed and the economies have been more volatile, leaving firms with fewer financing options, in some countries eliminating the long-term financing altogether (Chong and Lopez-de-Silanes, 2007). Lefort and Walker (2000) report evidence on how Chilean firms form conglomerates to overcome the lack of alternatives

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<sup>1</sup> In a sample of Latin American large firms, Johnston (2004) finds that the first two stockholders hold between 54% and 69% of total ownership, and the first five stockholders hold between 65% and 87% of total ownership.

for financing through internal capital markets. They argue that a firm in Chile to be competitive has to be part of an economic group or conglomerate.

Surprisingly, we do not find lower levels of leverage for Latin American firms in this paper. Looking at a comprehensive sample of Latin American firms from seven countries,<sup>2</sup> we find their book-value leverage ratios to be similar to those reported by Rajan and Zingales (1995) and Flannery and Rangan (2006) for U.S. firms.

Rajan and Zingales (1995) argue that the effect of ownership concentration on capital structure is far from obvious. On the one hand, the presence of large shareholders on the board of directors should reduce the extent of agency costs between managers and shareholders and facilitate equity issues. Furthermore, these shareholders should be undiversified, increasing their aversion to debt. On the other hand, if some of the shareholders are banks, they may force the firms to borrow from them. In Latin America the banks are not large shareholders as they are in Japan and Germany. But, as we have argued, firm control plays an important role in Latin America given the lack of protection for minority shareholders.

At the aggregate level our results support the idea that ownership structure strongly influences firms' leverage. We find a U-shape relation, where at high levels of ownership concentration the relation between leverage and ownership is positive, consistent with our previous argument that companies with highly concentrated ownership not seek equity financing in order to avoid losing control. On the other hand, at low levels of ownership concentration the relation between leverage and ownership is

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<sup>2</sup> We include 806 nonfinancial firms from seven Latin American countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela, from 1996 to 2005

negative. We argue that when control is not an issue—the inflexion point occurs at the middle of the sample when the first shareholder has at least 45% of ownership—undiversified shareholders exert their aversion to debt; Latin American firms follow a pecking order of financing alternatives when they need funds. In addition, we can expect that when ownership is disperse and given that Latin American investors are not well protected, the monitoring role of debt adds some value for those firms. At the country level however, these results are strong only for Brazil and Chile, the two countries with more observations in the sample. With the exception of Mexico, the coefficient signs, although not significant, are correct for all other countries. This is remarkable given the small number of observations for countries such as Argentina (21), Colombia (82) and Venezuela (43).

We also look at how the determinants of capital structure referred to in the literature<sup>3</sup> apply to Latin American firms. We empirically test if factors that do not proxy for ownership control--such as asset tangibility, size, growth opportunities, and profitability--help to explain the leverage in Latin American firms. This is among the first regional studies on the determinants of capital structure.

Consistent with the literature we find that size and asset tangibility are positively related to leverage. Larger firms have more access to financing sources and firms with more tangible assets have more collateral to support higher debt levels. Also consistent

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<sup>3</sup> Bradley, Jarrell, and Kim (1984); Titman and Wessels (1988); Kale, Noe, and Ramirez (1992); Flannery and Rangan (2006); and Hovakimian (2006) are part of the previous empirical literature that use large U.S. samples to study the capital structure determinants. The literature also explores capital structure determinants outside the United States. Rajan and Zingales (1995) use data from seven developed economies, and Booth et al (2001) use data from ten developing economies but only include two Latin American countries: Brazil and Mexico.

with previous literature, profitability is negatively related to leverage supporting the pecking order theory for Latin American firms.

Our result on growth is however contrary to literature, but consistent with our control argument. Titman and Wessels (1988) argue that agency costs and suboptimal investment lead growing firms to have less debt. Rajan and Zingales (1995) also refer to suboptimal investment to argue that firms with growing opportunities should use more equity. Contrary to previous literature, we find a strong and positive relation between growth and leverage, adding to our previous finding. Latin American firms that are growing and need cash avoid equity issues in order not to lose control.

This paper adds to the literature by examining the relation between capital structure and ownership in the context of the Latin America region, where ownership concentration tends to be high; we also corroborate some stylized facts about the determinants of capital structure in Latin America.

The rest of the paper proceeds as follows. Section 1 describes our data set, explains the constructions of the variables, and shows the principal descriptive statistics. Section 2 reports and discuss the results. Finally, section 3 concludes.

## **1. Data and research design**

Our data sample includes all Latin American firms with data available in the Economatica database from 1996 to 2005.<sup>4</sup> Economatica has financial data for firms in seven Latin American countries: Argentina, Brazil, Chile, Colombia, Mexico, Peru, and

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<sup>4</sup> Economatica is among the largest database of financial information for Latin American firms. It includes quarterly company financial statements, shareholder's information, financial and market data. The data can be display in US dollars or the local currency. We consider data starting in 1996 because before that year the data is very limited.

Venezuela. It includes firms that report their financial statements to local regulatory agencies. Ownership concentration data is collected from Economatica for Brazil, Chile, Colombia, Peru, and Venezuela. We collected ownership structure information directly from Reuters for Argentinean and Mexican firms, years 2005 and 2006.

The initial sample has 1,168 Latin American firms, which excludes firms in the financial sector. We use data from fiscal year-end consolidated financial statements measured in U.S. dollars. Stock prices are taken at the end of the calendar year. We drop firms with fewer than three years of balance sheet data and firms with less than \$250,000 of total assets. We also exclude state-owned firms, firms that do not have direct operations and that are used only as vehicles for other investments, and firms with leverage ratios lower than zero and higher than one. We then apply Hadi's (1992, 1994) outliers method to the control variables.<sup>5</sup>

Our final sample has 806 Latin American firms, covering an unbalanced panel of 6,766 firm-year observations.<sup>6</sup>

## **Variables**

### *a. Leverage*

We follow Rajan and Zingales (1995) and define leverage as the ratio of financial debt to debt plus equity. We consider both book value and market value equity. First, we define **leverage1\_bv** as the ratio of total debt financing (short- and long-term) to total debt financing plus the book value of equity.

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<sup>5</sup> Hadi's (1992, 1994) propose a multivariate outlier method that is based on the observation distance to a central cluster based on the multivariate covariance matrix. It is the outlier method used by the statistical software Stata. The exclusion of these outliers does not affect the results.

<sup>6</sup> To control for potential survivorship bias, we construct a subset of firms that are available for the entire sample period. The main results were similar to those reported in this paper's tables.

Depending on the country, Economatica excludes commercial papers and bonds from financial debt, instead calling them "negotiable obligations". We consequently use **leverage2\_bv** as our main measure of leverage; it includes short-term and long-term debt as well as negotiable obligations.

**leverage2\_mv** uses the same numerator as leverage2\_bv but uses market value of equity (defined as the number of shares outstanding times the stock price) in the denominator.

We also consider alternative measures of leverage, such as total financial debt to total book value of assets, and total liabilities to total assets. Our results are robust to the use of these alternative measures.

#### *b. Ownership*

To measure firm's ownership concentration, we use the Herfindahl index of the firm's ownership structure (**herf\_ind**). Herf\_ind is calculated as the sum of the squares of the fractions of equity held by each individual shareholder (as reported by Economatica):

$$herf\_ind = \sum_{i=1}^n s_i^2$$

where  $s_i$  is the percentage ownership of shareholder  $i$  and  $n$  is the number of total shareholders in the firm, as reported by Economatica<sup>7</sup>. High levels of *herf\_ind* represent high ownership concentration.<sup>8</sup>

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<sup>7</sup> This index tends to be underestimated given that some shareholders could be related (i.e., family ties). Grouping the ownership concentration if shareholder  $i$  has the same last name as shareholder  $j$  does not change the main results. Moreover, the sample includes just the main 10 shareholders, so the herfindahl index is downward bias. However, we have in our sample more than 70 percent of ownership ( $\sum s_i > 0,70$ ) for more than 2/3 of the firms included. Luckily this situation, if anything, plays in our favor because it tends to bias our t-values toward zero.

Jensen and Meckling (1976) argue that shareholders of a firm with more concentrated ownership may prefer less debt if debt brings more monitoring (see also Leland and Pyle (1977) and Diamond (1984)). Rajan and Zingales (1995) argue that the effect of ownership concentration on capital structure is far from obvious. On the one hand, the presence of large shareholders on the board of directors should reduce the extent of agency costs between managers and shareholders and facilitate equity issues. Furthermore, these shareholders should be undiversified, increasing their aversion to debt. On the other hand, if some of the shareholders are banks, they may force the firms to borrow from them. In Latin America the banks are not large shareholders as they are in Japan and Germany.

We however argue that firm control plays an important role in Latin America given the lack of protection for minority shareholders. Firms will prefer debt over equity if issuing equity means sharing or losing control. We expect the relation between ownership concentration and leverage to be positive. The more concentrated the firm's ownership is, the more likely current shareholders are to issue debt instead of equity when the company needs funds. That is, they will follow a debt over equity pecking order. We argue this effect should be more important or visible in Latin America than in the U.S. because ownership concentration, the percentage of family businesses, and the asymmetry of information in Latin America tend to be higher.<sup>9</sup> Shareholders of firms

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<sup>8</sup> If the firm has, for instance, only two shareholders who each own 50% of the company, the *herf-ind* will be 0.5 ( $=\text{sq}(0.5)+\text{sq}(0.5)$ ). On the other hand, if the firm has 5 shareholders with 20% ownership each, the *herf-ind* will be 0.2, indicating less ownership concentration. See Curry and George (1983) for a discussion on concentration proxies.

<sup>9</sup> In Latin America the relevant asymmetric information problem is not like in the developed economies between management and shareholder, but between large shareholders and the rest of the finance providers (small shareholders and debtholders). The reason is because controlling shareholders manage the

with highly concentrated ownership will not want to share or lose firm control, and they will avoid issuing equity if they are confident about the firm's future.

On the other hand, if the firm's ownership structure is dispersed (that is, there is low ownership concentration), the value of ownership control may lose importance for shareholders. In that case, other factors may play a role in making capital structure decisions, leaving us without a clear direction for this relation.<sup>10</sup>

As argued before, there are several country-specific reasons that Latin American companies should be less leveraged than their U.S. counterparts. In addition, debt markets in Latin America are smaller and less efficient. Fewer debt options, such as long-term bonds, are available to firms,<sup>11</sup> and the cost of debt is high for the average firm in the region.<sup>12</sup> Thus, Latin American companies should be less leveraged than those in the United States. However, as we show in the next section, this is not the case. We argue that firms in Latin America are more leveraged than they should be and that this *overleverage* can be explained by firms' ownership structures.

### *c. Size*

We use the log of sales as our measure of firm size (**log\_sales**). We expect a positive relation between size and leverage. Bigger firms are less likely to default on their debt

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“information flow” between all the parties involved. For a recent review of asymmetric information in Latin America see Chong and Lopez de Silanes (2007).

<sup>10</sup> Du and Dai (2005) show empirical evidence from East Asian firms that supports the idea that controlling shareholders with relatively small ownership concentration (high separation of cash flow rights and control rights) tend to increase leverage in order to obtain nondilutive shareholder control.

<sup>11</sup> For the majority of Latin American firms, financing is restricted to the banking system. Some firms can raise financing through multilateral agencies, however these resources are restricted to very limited uses and the amounts provided are relatively low. Other bigger firms raising capital through local bonds market, and although this has increased, it is still smaller than the bonds market in developed economies.

<sup>12</sup> During our study the average interest rate, measure as the ratio of total financial expenses to total financial debt, was never below 20% in the 1996-2005 periods.

obligations because they are more diversified and because it is cheaper for them to renegotiate and issue long-term debt securities. We consider the log of book value of assets as a robustness check.

#### *d. Taxes*

We use the effective tax rate (**tax\_rate**), which is calculated as the ratio of paid taxes to earnings before taxes. The paid taxes are calculated by subtracting earnings after taxes from earnings before taxes. We limit this variable to be between zero and one.

The expected sign for this variable depends on the capital structure theory we use. On one hand, a positive sign is consistent with the trade-off theory (De Angelo and Masulis 1980; Graham, 1996a, 1996b); on the other hand, a negative sign could be a proxy of firm's profitability and, consistent with the pecking-order theory, a lower debt level will be expected (Myers, 1977; Myers and Majluf, 1984).

#### *e. Asset tangibility*

We use the lag value of the ratio of fixed assets to total assets in order to assess the firm's asset tangibility (**txa\_ta**), which is a proxy for collateral value. The greater the collateral value of a firm's assets, the more value the debtholder can recover in case of default (Jensen and Meckling, 1976). We expect a positive coefficient relating tangibility and leverage.

#### *f. Profitability*

To assess the firm's profitability, we use the lag value of the ratio of earnings before interest and taxes to total assets (**ebit\_ta**). The expected sign for this variable depends also on the capital structure theory we use. On one hand, a positive sign is consistent with

the trade-off theory, which implies that the higher the firm's profitability, the higher the potential tax shields and therefore the higher the firm's debt level (De Angelo and Masulis, 1980); on the other hand, a negative sign indicates that the firm will finance its operations and investment opportunities using its own cash flow instead of using debt (Myers and Majluf, 1984).

*g. Growth opportunities*

We use two measures of firm's growth opportunities. First we consider a market-to-book ratio, **mve\_bve**. Second, we use the ratio of capital expenditure to fixed assets (**capex\_ta**). Capital expenditure is estimated as the one-year variation in fixed assets.

The expected sign of this variable is negative given the agency relation between managers and debtholders and given that growth opportunities are noncollateral assets; however, this relation depends on debt maturity because some of the agency problems could be mitigated issuing short-term debt (Myers, 1977). As in Titman and Wessels (1988), we expect a negative relation between long-term debt and growth opportunities and a positive relation between short-term debt and growth opportunities. In Latin America most debt obligations are short-term, therefore we expect a positive relation between our proxies for growth opportunities and leverage.<sup>13</sup>

In addition, if we argue that Latin American firms avoid issuing equity because they are interested in preserving control rights, growth opportunities should be positively related to leverage ratios.

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<sup>13</sup> La Porta et al (1997) argues that "the quality of legal protection has a significant effect on the ability of firms in different countries to raise external finance." Moreover, these authors find that French Civil Law countries have particularly small narrow debt and equity markets.

## **Descriptive statistics**

### *a. Leverage*

In Table 1 we present the descriptive statistics for our three main leverage measures across the sample and across countries for the period 1996–2005. As a whole, and using book values, the region has a **leverage1\_bv** of 29.45% and increases to 32.16% when we use **leverage2\_bv** (debt plus negotiable obligations). These ratios are similar to the 34% reported in Rajan and Zingales (1995) for the U.S. for a 1989–1996 sample period, and are higher than the 24.85% reported in Flannery and Rangan (2006), which uses a more recent and comprehensive data set of U.S. firms from 1965 to 2001. These results show, as we argued before, that Latin American firms are overleveraged compared with their U.S. counterparts.

In another paper, Booth et al (2005) reported average leverage ratios for Brazil and Mexico of 30.3% and 34.7%, respectively, for the period 1985–1991. In Table 1 we report similar leverage ratios for Brazil and Mexico—37.78% and 31.96%, respectively—for the period 1996–2005.

**[INSERT TABLE 1 HERE]**

Colombia and Venezuela have lower average book value debt ratios in our sample, with **leverage2\_bv** of 16.23% and 14.82%, respectively. However, they also have the fewest firm-year observations, making it possible that the leverage in these two countries is underestimated. After taking out Colombia and Venezuela, the average leverage in the sample is around 30% (**leverage1\_bv**) and 32% (**leverage2\_bv**).

In the whole sample, the number of observations falls dramatically when leverage using market values is considered (**leverage2\_mv**). For the full sample, **leverage2\_mv** averages 55.04%, which is much higher than similar leverage measures in the U.S.

(Rajan and Zingales, 1995; Flannery and Rangan, 2006). Although this difference is consistent with the higher market-to-book ratios historically shown by U.S. firms, it is also true that market liquidity and high transaction costs could considerably affect market values in our sample.<sup>14</sup>

*b. Debt determinants*

In Table 2 we present the descriptive statistics for the seven main debt determinants measured across the sample and across countries for the period 1996–2005. The descriptive statistics of our sample are consistent with those reported by Booth, et al (2001) for Mexico and Brazil. According to our sample, Latin American firms present an average effective tax rate is 24%, an average proportion of fixed assets of 48%, an average EBIT over total assets of 6%, an average market-to-book of 0.65, and an average ratio of capital expenditure to total assets equal to 4%.

**[INSERT TABLE 2 HERE].**

As expected, and consistent with La Porta et al. (1997) and more recently Chong and Lopez-de-Silanes (2007), the Latin American firms in our sample tend to be highly concentrated,<sup>15</sup> averaging an ownership Herfindahl index of 0.33. Peruvian firms show the highest concentration, with a Herfindahl index of 0.41, and Colombia the lowest with 0.24.

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<sup>14</sup> See Chong and Lopez-de-Silanes (2007) for a recent account of the development of Latin American financial markets.

<sup>15</sup> Chong and Lopez-de-Silanes (2007) reported the following ownership concentration levels for the countries in our sample (except Peru): Argentina, 53%; Brazil, 57%; Chile, 45%; Colombia, 63%; Mexico, 64%; and Venezuela, 51%.

## 2. Results

In this section, we first estimate leverage using as capital-structure determinants our proxies of growth opportunities, asset tangibility, size, and profitability. Then we include proxies of ownership concentration to study the effect of ownership control on leverage. Our estimations consider fixed-effect models and lagged independent variables.<sup>16</sup>

In Table 3, Panel A, we use **leverage2\_bv** as the dependent variable (we obtain similar nonreported results using **leverage1\_bv**). Consistent with Titman and Wessels (1988), Rajan and Zingales (1995), and Booth et al (2001), we find that asset tangibility (**fxa\_ta**) and size (**log\_sales**) influence positively firms' leverage in our sample of Latin American firms. Both coefficients are statistically significant for the full sample and remain positive and significant for each country. In the case of tangibility, the coefficient is negative only in Peru.

**[INSERT TABLE 3 HERE]**

The effect of profitability (**ebit\_ta**) is negative and significant in each country, consistent with previous evidence. The effect of our proxy for growth opportunities (**capex\_ta**) is positive and significant in the full sample regression and positive and significant in Brazil, Chile, and Peru. Although inconsistent with the international evidence (Rajan and Zingales, 1995), the positive relation we find between growth opportunities and leverage in Latin America can be explained by the desire of Latin

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<sup>16</sup> Fixed-effect models help to capture the effect of omitted explanatory variables, as explained by Himmelberg et al. (1999). We run separate regressions including industry dummies, following *Economatica* industry classification instead of firm dummies, and found no differences in the results.

American firms to avoid equity issuances and the consequent loss of control. Another reason is the higher use of short-term debt in the region (Titman and Wessels, 1988).

The results remain, when we estimate the regression model using **leverage\_mv** as dependent variable. However, as shown in Panel B, the number of observations for this estimation fell significantly.

In sum, we conclude that asset tangibility and size are positively related to leverage, and profitability is negatively related to leverage in Latin American companies. We also find a positive relation between growth opportunities and leverage, supporting the idea that debt is preferred to equity in this region. There are other reasons that could also explain this preference, such as the high transaction costs and low liquidity typical of the Latin American financial markets (Chong and Lopez-de-Silanes, 2007).

In Table 4, we include in the model our tax proxy (**tax\_rate**), and more important, the ownership concentration variable (**herf\_ind**). These regressions are run only on data for 2005 because the data on ownership concentration for Argentina and Mexico, collected from Reuters, is available only for that year. We run the same regressions, excluding Argentina and Mexico, with a panel of 1996-2005 and 2001-2005, obtaining the same results. The results from Table 3 regarding the positive relation between leverage and growth opportunities, asset tangibility, and size, and the negative relation between leverage and profitability continue to be strong in Table 4. We also report in Table 4 a negative and significant relation between leverage and taxes, consistent with the pecking-order theory and the idea that tax rate is a proxy for firm profitability.

In the first column of Table 4 we report a negative but not significant coefficient for ownership concentration. This result can be explained by the agency theory of capital

structure (Jensen and Meckling, 1976; Fama 1980; Fama and Jensen, 1983), which argues that high level of ownership concentration induces firms to issue less debt to avoid monitoring. Although this negative relation is consistent with the agency theory literature, it is not entirely applicable to our data set given the fact that top managers in Latin America usually have a very close relation with main shareholders. Another possibility is that when control is not an issue, undiversified shareholders exert their aversion to debt.

In Table 4, column 2, we include in the estimation the square value of **herf\_ind** to test whether the relation between leverage and ownership exhibits a nonlinear relation. We obtain a negative and significant coefficient for **herf\_ind** and a positive and significant coefficient for **herf\_ind<sup>2</sup>**. We interpret this result as evidence of a U-shape relation between leverage and ownership, where firms with low ownership concentration exhibit a negative relation with leverage, and firms with high ownership concentration exhibit a positive relation with leverage.

**[INSERT TABLE 4 HERE]**

In Table 4, columns 3 through 5, we follow Morck, Shleifer, and Vishny (1988) and split the **herf\_ind** variable in two. We consider three inflection points: 0.4, 0.5, and 0.6. **Herf\_ind** is then split into **herf\_ind<sub>0-x</sub>** and **herf\_ind<sub>x-1</sub>**. **Herf\_ind<sub>0-x</sub>** is equal to **herf\_ind** if **herf\_ind** is lower than x (inflection point), and **herf\_ind<sub>0-x</sub>** is equal to x otherwise. On the other hand, **herf\_ind<sub>x-1</sub>** is equal to x (inflection point) if **herf\_ind** is lower than x, and **herf\_ind<sub>x-1</sub>** is equal to **herf\_ind** otherwise.

In all our regressions the coefficient for **herf\_ind<sub>0-x</sub>** is negative and significant, and it is positive and significant for **herf\_ind<sub>x-1</sub>**. In sum, these results show a U-shape

relation between ownership concentration and leverage. This U-shape relation is consistent with the argument that, as the firm's ownership concentration increases, firms avoid issuing equity because they do not want to lose or share their control rights.

Consistent with this idea, we show in Table 3 (panel A) positive and significant coefficient for our proxy of growth opportunities (**capex\_ta**), which demonstrates that in our sample of Latin American firms' growth, is mainly financed by debt. This effect is still positive, although not significant, when we include ownership concentration in our regressions.<sup>17</sup>

The country regressions we show in Panel B of Table 4 also exhibit the U-shape relation, although it is statistically significant only in Brazil and Chile, the two countries with more observations in our sample. With the exception of Mexico, the coefficient signs, although not significant, are correct for all other countries. This is remarkable given the small number of observations for countries such as Argentina (21), Colombia (82) and Venezuela (43), which reduces considerably the statistical power of the estimation.

We perform several robustness checks (results are not reported) to test our main result on the relationship between leverage and ownership concentration. First we include control variables for macroeconomic effects such as stock market capitalization as a percentage of GDP, economic growth as the percentage change in GDP, and inflation rate. Second, we include controls for stock traded volume and stock liquidity. We also repeated the regressions in Tables 3 and 4 for 1996-2005, 2001-2005, 1996-2000, and

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<sup>17</sup> When we performed the same regression analysis (not reported but available from the authors) using panel data fixed effect equations, excluding Argentina and Mexico where ownership data was available only for the year 2005, **capex\_ta** was positive and significant and the U-Shape relation between leverage and ownership concentration was still present.

2005 sample periods. The main result of a U-shape relation between leverage and ownership concentration remains.

### **3. Conclusions**

In this paper we use a comprehensive database of 806 nonfinancial Latin American firms from 1996 to 2005 to be the first to test how ownership concentration affects capital structure decisions in Latin America. Latin American markets present us with an ideal setting for to study the effect of ownership concentration on leverage given the high concentration of Latin American firms' ownership. At the aggregate level our results support the idea that at high levels of ownership concentration, the relation between leverage and ownership is positive, consistent with the argument that companies with highly concentrated ownership do not seek equity financing in order to avoid losing control. At the country level these results are consistent across countries, although strong only for Brazil and Chile, the two countries with more observations in our sample. Consistent with our control argument, we report that Latin American firms with more growth opportunities tend to exhibit higher leverage.

We also find empirical support for the previous findings that size, growth opportunities, asset tangibility, profitability, and taxes are statistically and economically important in explaining the leverage in our sample of Latin American firms. Firms that are larger, have high-growth opportunities, and are less profitable tend to have more debt in the Latin American region.

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**Table 1 – Measures of leverage**

We define **leverage1\_bv** as the ratio of total debt financing (short- and long-term) to total debt financing plus the book value of equity; **leverage2\_bv** as the ratio of total debt financing (short- and long-term and negotiable obligations, which are debt instruments such as commercial paper and bonds outstanding) to total debt financing plus the book value of equity; **leverage2\_mv** as the ratio of total debt financing (short- and long-term and negotiable obligations) to total debt financing plus the market value of equity. The firm-year observations column represents book value measures and market value measures (in parenthesis). The percentage represents mean values and standard deviation (in parenthesis) across the sample for the period 1996–2005. The last two rows show the leverage ratios for U.S. firms according to Rajan and Zingales (1995) for the period 1987–1991 and Flannery and Rangan (2006). The number of observations for Rajan and Zingales data is cross-sectional for one year (1991), and the number of observations for Flannery and Rangan (2006) represents 12,919 U.S. firms from 1965 to 2001.

	<b>Firm-year observations</b>	<b>leverage1_bv (%)</b>	<b>leverage2_bv (%)</b>	<b>leverage2_mv (%)</b>
Argentina	716 (282)	29.83 (23.52)	34.36 (24.31)	39.24 (26.51)
Brazil	2,822 (1242)	35.86 (25.29)	37.78 (25.80)	84.09 (32.40)
Chile	1,363 (524)	20.84 (17.75)	24.35 (19.40)	30.38 (23.73)
Colombia	174 (24)	14.27 (17.20)	16.23 (18.06)	70.91 (39.13)
Mexico	1,319 (622)	27.70 (23.48)	31.96 (24.25)	29.76 (26.08)
Peru	561 (83)	32.01 (22.27)	32.01 (22.27)	33.32 (24.46)
Venezuela	212 (83)	14.82 (16.14)	14.82 (16.14)	36.37 (30.71)
Full sample	7,167 (2,860)	29.45 (23.77)	32.16 (24.38)	55.04 (38.73)
Rajan and Zingales (1995): U.S. firms	2,580		34.00	24.00
Flannery and Rangan (2006): U.S. firms	111,106		24.85	27.83

**Table 2 – Summary statistics**

In this table we present summary statistics of our proxies for size (**log\_sales**), taxes (**tax\_rate**), tangibility (**fxa\_ta**), profitability (**ebit\_ta**), growth opportunities (**mve\_bve** and **capex\_ta**), and ownership concentration (**herf\_ind**). The first and second number are the mean values and the standard deviation across the sample for the period 1996–2005, respectively, and the third number is the number of firm-year observations.

	<b>log_sales</b>	<b>tax_rate</b>	<b>fxa_ta</b>	<b>ebit_ta</b>	<b>mve_bve</b>	<b>capex_ta</b>	<b>herf_ind</b>
Argentina	11.55	0.26	0.51	0.05	0.89	0.03	0.26
	1.75	0.22	0.24	0.09	0.65	0.07	0.29
	711	201	716	716	274	688	36
Brazil	12.08	0.25	0.43	0.06	0.12	0.04	0.31
	1.85	0.17	0.23	0.09	0.35	0.08	0.27
	2775	999	2822	2822	1194	2660	2188
Chile	11.16	0.16	0.54	0.07	1.20	0.04	0.35
	2.02	0.13	0.24	0.07	0.84	0.07	0.25
	1324	462	1363	1363	514	1341	1031
Colombia	11.05	0.25	0.30	0.04	0.20	0.03	0.24
	2.01	0.18	0.17	0.07	0.35	0.05	0.20
	174	29	174	174	30	164	112
Mexico	12.41	0.28	0.48	0.07	1.24	0.05	0.29
	2.01	0.17	0.23	0.08	0.91	0.07	0.26
	1312	453	1319	1319	545	1274	56
Peru	10.48	0.19	0.53	0.06	0.52	0.04	0.41
	1.38	0.17	0.22	0.08	0.43	0.07	0.30
	559	63	561	561	70	532	449
Venezuela	11.04	0.21	0.54	0.05	0.36	0.06	0.34
	1.93	0.17	0.23	0.08	0.38	0.12	0.24
	210	48	212	212	70	198	80
Full sample	11.73	0.24	0.48	0.06	0.65	0.04	0.33
	1.96	0.17	0.24	0.08	0.82	0.07	0.26
	7065	2255	7167	7167	2697	6857	3952

**Table 3 – Determinants of leverage**

This table presents OLS regression using panel data with country fixed effects and OLS regression for each country using fixed effect. The dependent variable is **leverage\_bv** in Panel A and **leverage\_mv** in Panel B. The independent variables are defined in Table 2. The regression includes an intercept whose coefficient is not reported. Robust t-values are in parenthesis. \* = significant at 10%; \*\* = significant at 5%; \*\*\* = significant at 1%.

Panel A: dependent variable: leverage2_bv								
capex_ta	0.11*** (2.89)	0 (0.02)	0.13* (1.82)	0.20** (2.25)	-0.23 (0.67)	-0.09 (0.69)	0.27** (2.18)	-0.02 (0.14)
fxa_ta	0.05*** (4.15)	0.08** (1.98)	0.06** (2.29)	0.11*** (4.67)	0.16 (1.48)	0.08** (2.43)	-0.08* (1.80)	-0.08 (1.10)
log_sales	0.03*** (18.89)	0.05*** (8.89)	0.03*** (7.11)	0.04*** (12.93)	0.03*** (4.90)	0.03*** (8.67)	0.02*** (3.04)	0.03*** (3.71)
ebit_ta	-0.62*** (17.39)	-0.85*** (7.51)	-0.48*** (6.88)	-0.72*** (10.44)	-0.39* (1.73)	-1.04*** (11.02)	-0.55*** (4.30)	-0.42** (2.45)
Observations	6766	684	2620	1304	164	1267	531	196
Country	All	AR	BR	CL	CO	MX	PE	VE
R-squared	0.08	0.17	0.06	0.21	0.15	0.13	0.07	0.13
Fixed-effects	country	--	--	--	--	--	--	--
dummies	year	year	year	year	year	year	year	year
Panel B: dependent variable: leverage2_mv								
capex_ta	0.21*** (2.89)	-0.2 (0.82)	0.27* (1.96)	0.09 (0.81)	3.04 (1.38)	-0.12 (0.51)	0.35 (0.79)	0.17 (0.43)
fxa_ta	-0.03 (1.28)	0.34*** (4.90)	-0.32*** (6.28)	0.21*** (4.79)	-0.11 (0.15)	0.15*** (2.95)	0.01 (0.05)	0.17 (0.64)
log_sales	0.04*** (11.00)	0.01 (0.84)	0.06*** (8.30)	0.03*** (5.16)	0.16*** (3.17)	0.02*** (2.77)	0.02 (1.09)	0.04 (1.44)
ebit_ta	-0.56*** (8.01)	-0.74*** (4.41)	-0.14 (1.19)	-1.43*** (8.24)	-1.22 (0.76)	-1.36*** (9.20)	-0.77** (2.01)	-0.17 (0.29)
Observations	2780	278	1189	513	22	618	79	81
Country	All	AR	BR	CL	CO	MX	PE	VE
R-squared	0.07	0.25	0.14	0.29	0.68	0.16	0.14	0.17
Fixed-effects	country	--	--	--	--	--	--	--
dummies	year	year	year	year	year	year	year	year

**Table 4 – Determinants of leverage with ownership**

This table presents OLS regression for all countries in the year 2005 (panel A) and OLS regression using fixed effect panel data (2001-2005) for each country except for Argentina and Mexico where we report OLS results for the year 2005. The dependent variable is **leverage2\_bv** for columns 1 through 6 and **leverage2\_mv** for column 7 in Panel A. Individual country regressions use **leverage2\_bv** as the dependent variable in Panel B. The independent variables are defined in Table 2. The regression includes an intercept whose coefficient is not reported. Robust t-values are in parenthesis. \* = significant at 10%; \*\* = significant at 5%; \*\*\* = significant at 1%.

Panel A: Regressions for all countries year 2005							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dep. Variable	leverage2_bv					leverage2_mv	
capex_ta	-0.14 (0.81)	-0.11 (0.66)	-0.11 (0.63)	-0.11 (0.67)	-0.12 (0.71)	0.00 (0.03)	0.10 (0.61)
fxa_ta	0.11** (1.97)	0.12** (2.26)	0.12** (2.20)	0.12** (2.23)	0.12** (2.32)	0.11** (2.02)	0.06 (1.17)
log_sales	0.03*** (4.94)	0.03*** (4.70)	0.03*** (4.76)	0.03*** (4.78)	0.03*** (4.80)	0.02*** (4.15)	0.01*** (2.61)
ebit_ta	-0.28** (1.98)	-0.29** (2.08)	-0.29** (2.11)	-0.29** (2.10)	-0.29** (2.08)	-0.34** (2.40)	-0.21 (1.62)
tax_rate	-0.28*** (4.30)	-0.27*** (4.18)	-0.26*** (4.10)	-0.27*** (4.19)	-0.27*** (4.26)		-0.23*** (3.81)
herf_ind	-0.02 (0.58)	-0.46*** (3.33)				-0.50*** (3.54)	-0.42*** (3.22)
herf_ind^2		0.47*** (3.30)				0.50*** (3.44)	0.44*** (3.22)
herf_ind <sub>0-x</sub>			-0.28*** (2.99)	-0.23*** (2.97)	-0.20*** (2.99)		
herf_ind <sub>x-1</sub>			0.18** (2.30)	0.27*** (2.64)	0.41*** (3.01)		
<b>Inflexion (x)</b>			<b>0.40</b>	<b>0.50</b>	<b>0.60</b>		
Observations	403	403	403	403	403	403	403
Country	All	All	All	All	All	All	All
R <sup>2</sup>	0.1	0.13	0.13	0.13	0.13	0.09	0.09

Panel B: Individual country regressions

Dep. Variable	leverage2_bv						
capex_ta	-0.30 (0.38)	0.24** (1.99)	0.15 (1.02)	0.03 (0.07)	-0.64 (1.15)	0.47 (1.31)	0.49*** (4.22)
fxa_ta	-0.01 (0.04)	0.19*** (4.59)	0.07** (2.05)	0.05 (0.40)	-0.01 (0.08)	0.03 (0.37)	0.10 (0.85)
log_sales	0.11*** (4.47)	0.02*** (3.39)	0.04*** (14.11)	0.03** (2.27)	0.06** (2.73)	0.05*** (4.12)	0.01 (0.21)
ebit_ta	-1.69*** (5.28)	-0.20** (2.12)	-0.72*** (6.61)	-0.42 (1.03)	-0.21 (0.44)	-0.61*** (2.72)	-0.06 (0.42)
tax_rate	-0.36** (2.19)	-0.28*** (6.32)	0.07 (0.98)	-0.09 (0.58)	-0.02 (0.11)	-0.17 (1.47)	-0.05 (0.72)
herf_ind	-0.41 (1.18)	-0.35*** (3.22)	-0.20** (1.96)	-0.15 (0.60)	-0.09 (0.20)	-0.04 (0.18)	-0.32 (0.72)
herf_ind <sup>2</sup>	0.25 (0.68)	0.38*** (3.32)	0.13* (1.92)	0.39 (1.10)	-0.04 (0.08)	-0.02 (0.07)	0.24 (0.58)
Observations	21	1027	556	82	40	155	43
R-squared	0.70	0.11	0.30	0.18	0.22	0.10	0.29
Country	AR	BR	CL	CO	ME	PE	VE
Fixed-effects	--	--	--	--	--	--	--
dummies	--	Year	year	year	--	year	year