The Evolution of Corporate Ownership after IPO: The Impact of Investor Protection

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Panel data on corporate ownership in thirty-four countries between 1995 and 2006 reveal that newly public firms have concentrated ownership regardless of the level of investor protection. After listing, firms in countries with strong investor protection are more likely to experience decreases in ownership concentration; these decreases occur in response to growth opportunities, and they are associated with new share issuance. We conclude that ownership concentration falls after listing in countries with strong investor protection, because firms in these countries continue to raise capital and grow, diluting blockholders as a consequence. (*JEL* G32, K22, O43)

Recent research shows that corporate ownership is less concentrated in countries where minority shareholders are better protected against expropriation. La Porta, Lopez-de-Silanes, and Shleifer (1999); Dyck and Zingales (2004); and Djankov et al. (2008) find higher incidence of concentrated ownership among large firms in countries where the private benefits of control are high. Claessens, Djankov, and Lang (2000) and Faccio and Lang (2002) document similar patterns across firms in Asia and Europe.

We show that the ownership concentration of newly public firms does not vary with investor protection. Immediately following the initial public offering (IPO), ownership tends to be fairly concentrated in both countries that do, and countries that do not, provide strong protection to minority shareholders. Measures of investor protection are strongly associated with more dispersed ownership only in samples of mature public firms or in broad cross-sections of young and old firms.

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Why does investor protection matter in the full cross-section, but not for newly public firms? Mechanically, it must be due to differences in the experiences of these firms following their IPO. After first listing on the stock market, firms in countries with better institutions become widely held at a faster rate. This is apparent in the contrast between the typical newly listed firm in the United States and its counterpart in Brazil. In both countries, block ownership of the median firm is about 50% soon after listing. However, in the United States, block ownership of the median firm drops to 21% within five years, while in Brazil it remains approximately constant.

We assemble new panel data on corporate ownership covering a large panel of firms in 34 countries between 1995 and 2006, including 2,700 firms that go public during this period. Relative to previous studies, the advantage of our data is that we observe blockholdings as well as shares outstanding over the early lifespan of these firms as public entities, rather than at a single point in time. This makes it possible to track two conceptually distinct mechanisms underlying ownership dynamics: blockholder sales and issuance of follow-on external equity, including seasoned equity offerings and equity issued in the course of mergers and acquisitions.

In examining the impact of investor protection, we build on the approach taken by Helwege, Pirinsky, and Stulz (2007), henceforth HPS (2007), who explore differences in the evolution of ownership among U.S. listed firms. HPS (2007) find that stock market liquidity has significant effects on the diffusion of ownership—liquid stocks with high past returns tend to become widely held more quickly. However, they do not find evidence that agency problems influence the diffusion of ownership in the United States. But, as they point out, there is limited variation in such agency problems across firms in their sample. Moreover, as shown by Doidge, Karolyi, and Stulz (2007), country-specific characteristics explain more of the variation in firms' corporate governance than firm-specific characteristics. Our cross-country panel data therefore offer a suitable setting to study the effects of agency costs on the diffusion of corporate ownership.

The first hypothesis that we test is that there is a positive association between investor protection and the speed at which firms become widely held. This hypothesis follows directly from the extensive literature on the influence of agency costs on optimal corporate ownership. In one popular theory, agency problems arise when a controlling shareholder reduces his ownership stake, leading to a separation between ownership and control (e.g., Jensen and Meckling 1976). In this case, the controlling shareholder has an incentive to shirk or divert resources at the expense of minority shareholders. Purchasers of minority ownership stakes anticipate these agency problems. Controlling shareholders therefore trade off any benefits of selling equity with the consequences of obtaining new equity at a price that reflects agency problems. To the extent that investor protection limits agency problems, controlling shareholders are more likely to sell equity. Several papers, including La Porta, Lopez-de-Silanes,

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and Shleifer (1999), appeal to this logic when explaining correlations between corporate ownership and investor protection.[1]

Another strand of the literature generates a similar prediction. In this work, large shareholders act to protect their private benefits (e.g., Zingales 1995; Bebchuk 1999). When the private benefits of control are large, the large shareholder avoids ceding control to a potential rival who wants to consume these private benefits himself. Bebchuk (1999) argues that this explains why, in environments where the private benefits of control are large, publicly traded companies have a controlling shareholder.

While the mechanisms in the above theories differ, one overall conclusion is that holding constant investment opportunities, investor protection increases insiders' willingness to sell equity. Because firms typically start their lives with concentrated ownership, these theories can be interpreted as predicting a positive association between investor protection and the pace at which firms become widely held.

A crucial refinement that we consider is that there are implications for the *interaction* of investor protection with growth opportunities. Blockholders trade off the costs of selling equity or losing control with the potential benefits of new capital. When the benefits of new capital are high, such as when firms face growth opportunities, the benefits of shareholder protection are greater. For firms facing better growth opportunities, the trade-off is more likely to favor share issuance, and thereby ownership dilution, in environments where investor protection limits the scope of agency problems. Thus, strong investor protection should interact with growth opportunities to predict diffusion of ownership. And, to the extent that decreases in ownership are driven by the desire to invest, they should primarily be a consequence of share issuance rather than blockholder sales. In summary, we propose a path-dependent theory of ownership structure in which a firm's ownership depends on the trade-offs blockholders have made between ceding control and bringing in external capital. Naturally, this theory requires the investment opportunities faced by firms to vary after they have first gone public.

While the predictions above concern the dynamics of corporate ownership, they have natural implications for firms' overall use of leverage and patterns in growth. Faced with growth opportunities, firms in countries with poor protection of minority shareholders may rely more heavily on debt to finance growth. The findings reviewed in Levine (2005) suggest that firms in countries with weak investor protection are still likely to be constrained in their ability to raise

[1] Recent papers have questioned the strength of the correlation between investor protection and ownership concentration in the data. See Gadhoum, Lang, and Young (2005); Holderness (2009); and Spamann (2008). Franks, Mayer, and Miyajima (2008) and Franks, Mayer, and Rossi (forthcoming) show that changes in investor protection do not explain time-series variation in corporate ownership structures adopted in Japan, arguing that other mechanisms may substitute for investor protection.

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capital.[2] Put differently, in weak investor protection regimes, we expect firms to substitute toward debt financing, but finance less growth overall.

We find support for all of the above predictions. Firms in countries with strong investor protection become widely held faster, even though ownership is concentrated for a few years around the IPO. Both new share issues and blockholder sales are more common in countries where protection is strong and private benefits of control are small. Investor protection has a particularly pronounced effect on the diffusion of ownership for firms with attractive growth opportunities. Such firms appear to be more willing to issue new shares, thereby diluting ownership. We also find that firms in countries with weak legal protection of shareholders rely more heavily on debt as a source of capital when they face growth opportunities. However, firms' ability to substitute away from equity to debt appears incomplete. Consistent with other research on finance and growth, we find that firms in countries with weaker investor protection invest less than firms in countries with stronger investor protection when facing attractive growth opportunities. To sum up, the results collectively imply that one of the reasons that ownership concentration falls as firms age is that when investor protection is strong, firms are more likely to raise capital and grow.

We consider several alternative hypotheses concerning the diffusion of corporate ownership, each of which could potentially distort the conclusions described above. One alternative explanation is that changes in corporate ownership reflect blockholders' and managers' explicit attempts to time the market. Two-thirds of the CFOs surveyed in Graham and Harvey (2001) identify the extent to which equity is "overvalued or undervalued" as an important consideration in the decision to issue external equity. Pagano, Panetta, and Zingales (1998) and Kim and Weisbach (2008) find that firms use only a fraction of the funds they raise for investment, suggesting that market timing plays a role in new issues. Baker and Wurgler (2002) suggest that timing motives help explain the capital structures of U.S. firms. In our data, there is some evidence that ownership diffusion is faster when market equity prices are high. However, we do not find any evidence that market timing is more prevalent in countries with strong investor protection.

A second alternative is that measures of investor protection are correlated with stock market liquidity, i.e., the ability of blockholders to find a buyer for their shares. Liquidity would have an effect on ownership concentration if insiders would like to sell shares but are reluctant to do so because such sales would put downward pressure on the stock price. Bhide (1993) suggests that stock market liquidity is one reason why the United States has so many widely held firms; Maug (1998) shows that large shareholders should hold smaller stakes when the market is more liquid. HPS (2007) emphasize the role of stock

[2] See, for example, Demirgüç-Kunt and Maksimovic (1998); La Porta et al. (1998); Rajan and Zingales (1998); Levine (1999); Beck, Levine, and Loayza (2000); Claessens and Laeven (2003); and Beck, Demirgüç-Kunt, and Maksimovic (2005).

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market liquidity in explaining the diffusion of ownership of U.S. firms: stocks with high turnover, for example, tend to become widely held at a faster rate. Consistent with this previous work, we find some evidence that proxies for stock market liquidity affect ownership diffusion, but again, these effects do not cloud our inferences on the impact of investor protection.

Third, our estimates of the impact of investor protection on ownership diffusion might reflect differences in the types of firms that go public in different environments. Pagano, Panetta, and Zingales (1998) present evidence that Italian firms are larger and older than U.S. firms at the time of their IPO.[3] This could imply that firms in countries with weak investor protection require less capital following their IPO, thus reducing the extent to which blockholders are diluted by secondary share issuance. In our data, at the time they go public, firms in countries with weak investor protection are larger, more profitable, and less R&D intensive than their counterparts in countries with strong investor protection. Our regression analyses condition on these characteristics, as well as measures of growth opportunities directly. These controls partially address concerns about differences in firm characteristics. Although the characteristics of firms that go public differ across investor protection regimes, these differences do not distort our earlier conclusions.

A last alternative explanation is that growth opportunities differed across countries during our sample period in a way that is correlated with investor protection. While we measure and control for growth opportunities directly, measurement error could be correlated with country-specific characteristics. Consider the case in which actual growth opportunities were better than measured opportunities in countries with strong investor protection. In this case, firms in these countries might have stronger incentives to issue equity and become widely held. We show that only a small part of the variation in growth opportunities across firms is attributable to cross-country differences.

The remainder of the article is organized as follows. The next section describes our data in more detail. Section 2 presents our main country- and firm-level results. It also contains subsections that consider further implications of our findings. Section 3 discusses alternative mechanisms that could explain the diffusion of corporate ownership. The last section concludes.

1. Data

1.1 Investable weight factors

We rely on a database of "investable weight factors" assembled by Standard and Poor's. These data have been collected with the goal of adjusting the weights of stocks in their global index products. Most of the major global stock indexes

[3] Claessens and Laeven (2003); Klapper, Laeven, and Rajan (2006); and Kumar, Rajan, and Zingales (2008) consider how firm-specific characteristics differ across countries more generally.

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(e.g., S&P, MSCI, Topix, and FTSE) employ some degree of float weighting in index construction.

The investable weight factor F is

$$F_{it} = 1 - \frac{\sum_j BH_{ijt}}{N_{it}}, \tag{1}$$

where BH denotes the number of shares held by blockholder j of firm i and N denotes total shares outstanding. We define the blockholding share as 1 minus the free float, or

$$BHS = 1 - F_{it} = \frac{\sum_j BH_{ijt}}{N_{it}}. \tag{2}$$

The underlying blockholder data are culled from a variety of national sources. Our data account for blocks owned by three types of entities, which hold their shares in part because of the benefits of control. These include (i) publicly traded corporations, venture capital firms, private equity firms, and leveraged buy-out groups; (ii) government entities; and (iii) current or former officers and directors of the company, founders of the company, pension funds, and employee stock ownership plans that are associated with and controlled by the company. Within each group of blockholders, holdings are only considered when they cumulate to over 10% of shares outstanding. However, individual holdings below 5% of shares outstanding are ignored, except where they belong to clearly related shareholders like family members or board members. The intent of this somewhat arbitrary rule is to attempt to normalize the measure across countries, which have different reporting standards.

The holdings of mutual funds, insurance companies, and independent foundations are not considered to be a part of blockholdings even if such holdings are large because these owners are assumed to hold shares solely for purposes of collecting investment returns. For stocks that have secondary listings as American Depository Receipts (ADRs), stock held for the ADR is included in the float. While government holdings are in principle part of blockholdings, they tend to be small for the vast majority of firms in our sample. While it is potentially interesting to disaggregate these data to understand the dynamics of ownership among different types of blockholders, our data do not allow it.

Ownership data are at the security level rather than the firm level. As a consequence, we may not accurately measure the extent to which owners use multiple share classes to exert control. As a robustness check, we have excluded firms for which Datastream reports the existence of more than one share class that is traded in public markets. A related issue is that our data do not allow us to observe other mechanisms by which controlling owners separate cash flow rights from control rights, such as the use of pyramids.

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Because we are not interested in changes in reported ownership concentration that are related to changes in ownership restrictions, we exclude industries in which these restrictions are prevalent, including airlines, banks, and utilities. This is similar to the practice adopted by HPS (2007), who exclude banks and utilities.[4]

Similar to other studies on ownership concentration, our data do not allow us to track the ownership of firms after they are acquired. For example, it may be that some firms become widely held by being acquired by other firms that have dispersed ownership. Notwithstanding this, we can track ownership when a firm *issues* equity in an acquisition but continues to survive. This appears in our data as an increase in total shares outstanding, and is a common form of ownership dilution. Rossi and Volpin (2004) and Kim (2007) analyze differences between mergers across countries: consistent with intuition, they find that stock-based mergers are more common in environments where investor protection is stronger.

When studying corporate ownership, data integrity is of primary importance. As pointed out by Gadhoum, Lang, and Young (2005); Holderness (2009); and others, conclusions may be sensitive to the sample of firms and to the quality of the underlying data. We have checked the accuracy of our ownership data against other sources. Specifically, we match our data with hand-collected data used in Claessens, Djankov, and Lang (2000); Faccio and Lang (2002); Lins (2003); Dlugosz et al. (2006); and Holderness (2009). Each of these papers assembles data from a variety of national databases to study the cross-section of ownership in specific countries or regions. With the exception of Dlugosz et al. (2006), these datasets measure ownership in a single year, and hence would not be suitable data sources for the purposes of this article. Nevertheless, these data and our data are similar along measurable dimensions. For firms that appear in our data and the alternative data, the mean blockholder share of ownership is, respectively, 24.9% and 26.6%, and the firm-level ownership measures are 52% correlated. We also merge our data with ownership data drawn from Worldscope. Firm-level measures of blockownership from these two sources also have similar means and a correlation of 0.74.

Despite these checks, we might still expect data limitations to induce measurement error at the firm level. To reduce the potential impact of data errors, we point out that we are interested in *changes* in ownership concentration. Level differences in the quality of firm-level data should not affect our inferences, and we see no reason that measurement error should be correlated with any of our explanatory variables. Nevertheless, we apply a cautious empirical approach in that we focus on changes in blockholding greater than 5%.

[4] Some countries impose industry-specific ownership restrictions. Most of these restrictions limit foreign holdings. In the United States, for example, foreign ownership of airlines is limited to 20%. These restrictions are most prevalent among airlines, banks, and utilities, which we exclude. To address concerns about other instances of ownership restrictions, we have identified firms for which block ownership does not change during the sample period and remains fixed between 50% and 90%. These are rare in our data. We have checked that our baseline firm-level regressions in Table 5 produce the same results when these firms are removed.

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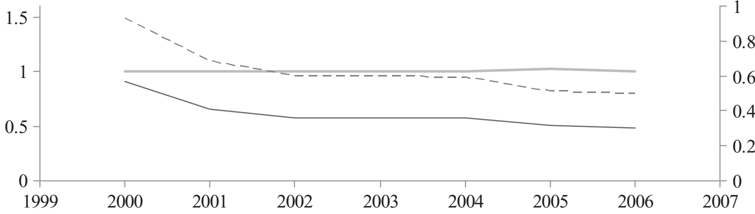
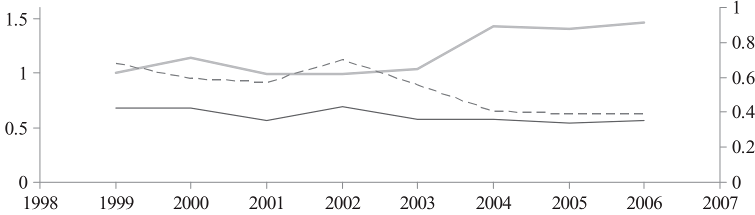
Panel A: Nihon Eslead 2000-2006



Panel B: Carrier Access 1999-2006



Panel C: Infineon 2000-2006

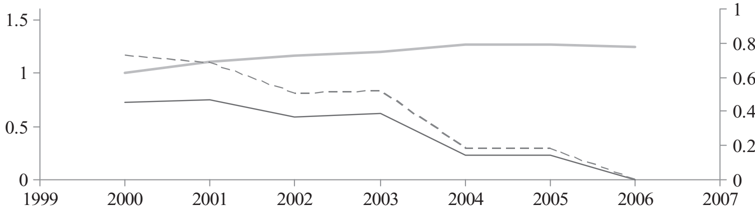


Figure 1
Dynamics of ownership
The evolution of shares outstanding, total blockholdings, and the blockholding share for three firms following their IPO. Total shares outstanding (thick lighter line) and total blockholdings (thin darker line) are plotted on the left vertical axis. The blockholding share (dashed line) is plotted on the right axis. On the left axis, both series are scaled by shares outstanding at the IPO. Nihon Eslead (panel A) is a real-estate developer in Japan. Carrier Access (panel B) manufactures telecommunications equipment. Infineon (panel C) is a spin-off from German industrial conglomerate Siemens.

1.2 Dynamics of corporate ownership: some examples

To provide some intuition for the process by which firms become widely held, we briefly consider some examples that make evident that the percentage of shares outstanding held by blockholders can change for two reasons: either blockholders buy or sell, or the firm issues or repurchases outside equity.

Our first example, Nihon Eslead, a condominium developer in Japan, is a firm for which the blockholding share decreases following the IPO primarily because of sales from the largest blockholder. The firm initially went public in October 1999, but our coverage begins in December 2000. Panel A of Figure 1 shows the dynamics of the blockholding share for this firm. The thick lighter line shows the number of shares outstanding each year scaled by shares outstanding at the end of December 2000. The thin darker line shows total blockholdings in

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a particular year scaled by December 2000 shares outstanding. The dashed line (measured on the right axis) shows blockholdings in a particular year expressed as a percentage of shares outstanding in that year. In 2000, the majority of shares were owned by founder Sugio Aramaki. Shares outstanding remained approximately level between 2000 and 2006. Over this period Aramaki and another blockholder sold many of their shares so that blockholdings, expressed as a percentage of shares outstanding, fell from 91% to 48%. Data from the *Japan Securities Handbook* confirm these trends.

Our second example, Carrier Access, traded on NASDAQ, is a firm for which the largest increase in float occurs primarily because of a share issuance. The company first went public in July of 1998, and cofounding spouses Roger Koenig and Nancy Pierce together maintained ownership of approximately half of the company's shares. Between 2003 and 2004, the fraction of shares held by blockholders fell from 0.56 to 0.40 because of shares issued in a secondary offering. As shown in panel B of Figure 1, this event is the largest change in float during the sample period.

Panel C of Figure 1 shows our last example: increases in float for the German firm Infineon Technologies occur *jointly* through the issuance of equity due to stock-based mergers and acquisition and blockholder sales.

1.3 Other data

We limit the sample to firms that can be identified on Worldscope and Datastream, which are also the source of many of the controls in our firm-level regressions. We draw data from the full database, as well as the subset in which we can track ownership of the firm immediately after their IPO. In this case, we use the Datastream "base date" to identify a firm's first listing date.[5] We include new listings for which we have ownership data within eighteen months of the listing date, and additionally require that each country have at least one firm in the country that can be tracked soon after its IPO and that this firm have at least five consecutive years of data. This is to ensure that we have a representative sample in each country. The IPO sample (our primary sample) includes 14,087 firm-years, comprising 2,700 unique firms. Table 1 gives a breakdown of our data by year and by country. Our data cover thirty-four countries: twenty-three of these countries are covered from 1995 onward and the remaining eleven countries from 1998 onward. With the exception of Argentina, which has only one firm that we can track from IPO, every other country has at least six firms in the IPO sample, and at least twenty firms in the full database.[6]

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[5] We have checked our sample of IPOs against a sample of IPOs identified in SDC and CRSP, and approximately 82% of our IPOs appear in these other samples. Results obtained using this more limited sample are not materially different from those presented in the article.

[6] In the original data, there is information on firms in fifty-three countries. For many of these countries, such as Indonesia, while we have information on blockholdings for a number of firm-years, there are no firms that we can track post-IPO. Thus, the final sample of thirty-four countries is based on data availability.

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Table 1
Sample construction

Panel A: By year

Year	Number of countries	Firm-years	Number of IPOs	IPO sample: Firm-years
1995	23	3,385	159	85
1996	23	3,739	140	215
1997	23	4,126	205	367
1998	34	6,343	303	569
1999	34	7,135	382	787
2000	34	7,626	459	1,136
2001	34	7,478	238	1,462
2002	34	7,389	177	1,629
2003	34	7,381	107	1,752
2004	34	7,652	208	1,866
2005	34	8,341	322	2,079
2006	34	7,820	0	2,140
Total		78,415	2,700	14,087

Panel B: By country

Country	First sample year	Firm-years	Number of IPOs	IPO sample: Firm-years
Argentina	1998	102	1	6
Australia	1995	1,796	71	336
Belgium	1995	423	19	89
Brazil	1998	729	42	247
Canada	1995	3,686	123	546
Chile	1998	274	8	49
Denmark	1995	582	14	101
Egypt	1998	95	6	25
Finland	1995	695	24	159
France	1995	2,102	62	382
Germany	1995	1,951	96	514
Greece	1995	634	24	98
Hong Kong	1995	1,658	48	279
India	1998	721	13	47
Ireland	1995	283	6	22
Israel	1998	432	18	101
Italy	1995	1,325	53	291
Japan	1995	14,562	229	935
Korea	1995	1,720	60	258
Malaysia	1998	887	13	40
Mexico	1998	425	11	46
Netherlands	1995	999	28	167
New Zealand	1995	249	8	52
Norway	1995	531	27	109
Portugal	1995	168	13	95
Singapore	1995	841	35	181
South Africa	1998	868	12	51
Spain	1995	721	31	176
Sweden	1995	1,246	46	298
Switzerland	1995	1,284	36	197
Taiwan	1998	2,458	112	481
Thailand	1998	311	8	21
United Kingdom	1995	5,020	141	816
United States	1995	28,637	1,262	6,872
Total		78,415	2700	14,087

This table provides information about all firms for which data on the blockholding share data are available and which are identified on Worldscope, summarized by year. Panel A reports the number of countries represented, the number of firm-years, the number of IPOs, and the number of firm-years for the firms in the IPO sample. Panel B reports the corresponding statistics by country. Because we require at least two consecutive observations of the blockholding share, the sample does not include firms that went public in 2006.

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Worldscope and Datastream provide data used to compute two measures of Tobin's Q. The first of these is firm specific: the ratio of the sum of the market value of equity and the book value of debt to the book value of assets for each firm in each year. While this measure should reflect opportunities faced by individual firms, it may also reflect a firm's ability to pursue those opportunities. For example, suppose that investment opportunities in the steel industry are high, reflected in steel firms' generally high Q. However, if a firm in that industry is unable to exploit those opportunities, its realizable investment opportunities will be low, as will be its Q. Since ideally we would have a measure of Q that is a pure proxy for the investment opportunities faced by the firm, we also compute average Tobin's Q across all firms (and thus, across all countries) in an industry-year. Unlike firm-specific Q, this measure is not contaminated by firms' ability to pursue growth opportunities.

Additional controls include the log of assets; the ratio of net property plant and equipment (net PPE) to assets; the ratio of earnings before interest, taxes, and depreciation (EBITDA) to sales; a dummy equal to 1 for firms that report research and development (R&D) expenditures; the ratio of R&D to assets (set equal to zero for firms that do not report R&D); and the ratio of debt to assets. We obtain market capitalization from Standard and Poor's and combine it with split-adjusted stock prices from Datastream to calculate shares outstanding. For U.S. firms, we take shares outstanding directly from the Center for Research in Securities Prices (CRSP).

Our analysis also employs several measures of country-specific characteristics, including two measures of investor protection. The first of these is the Djankov et al. (2008) anti-self-dealing index, which is a composite index of the degree to which a country's laws protect minority shareholders against expropriation by corporate insiders. This measure is theoretically grounded, predicts a variety of stock market outcomes, and addresses concerns that have been raised about the antidirector rights index developed in La Porta et al. (1998).[7] The second variable is a price-based measure of the private benefits of control. Building on a methodology used by Barclay and Holderness (1989), Dyck and Zingales (2004) measure the average premium that acquirers pay for controlling a block of shares. Last, several of our regression specifications include country-level measures of market liquidity: Stock market turnover is defined as market-level shares traded scaled by shares outstanding.[8]

Panel A of Table 2 summarizes the country-level data, and panel B summarizes the data used in the firm-level analysis for the IPO sample. All firm-level-scaled variables are winsorized at the 1% and 99% level.

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[7] A previous version of this paper replicates most of our results using the earlier La Porta et al. (1998) antidirector measure. Spamann (2008) points out some concerns about this alternative measure.

[8] Stock market turnover data are taken from La Porta, Lopez-de-Silanes, and Shleifer (2006).

Table 2
Summary statistics: country- and firm-level characteristics

	N	Mean	Median	Standard deviation	Min.	Max.
Panel A: Country characteristics						
Median Blockholding Share (in 2005)	34	0.38	0.39	0.20	0.00	0.76
Median Blockholding Share (following IPO)	34	0.53	0.53	0.17	0.20	0.83
Anti-Self-Dealing Index	34	0.54	0.47	0.25	0.17	1.00
Block Premium	31	0.11	0.04	0.15	−0.04	0.65
Stock Market Turnover	34	0.74	0.63	0.59	0.10	3.15
Log of GDP per capita	34	9.53	9.95	1.02	6.37	10.60
Panel B: Firm characteristics						
Dependent variables						
Blockholding Share	13,392	0.35	0.34	0.26	0.00	1.00
Decrease in the Blockholding Share Dummy	12,248	0.33	0.00	0.47	0.00	1.00
$(BH/N^*(\Delta N/N)) > 0$	12,217	0.19	0.00	0.40	0.00	1.00
$(BH/N^*(\Delta N/N)) \leq 0$	12,217	0.13	0.00	0.34	0.00	1.00
Increase in Leverage Dummy	12,452	0.18	0.00	0.38	0.00	1.00
Change in Net PPE	12,627	0.10	0.06	0.37	−2.00	2.00
Controls and RHS variables						
Firm-specific Tobin's Q_{t-1}	14,087	2.22	1.46	2.07	0.08	9.90
Industry Q_{t-1}	14,087	2.07	1.70	1.23	0.26	6.48
Lagged Firm-Level Stock Returns	14,087	0.24	0.00	0.93	−0.99	31.94
Log Assets_{t-1}	14,087	13.04	12.92	1.53	6.89	20.37
Net $\text{PPE}_{t-1}/\text{Assets}_{t-1}$	14,087	0.26	0.18	0.23	0.00	0.92
$\text{EBITDA}_{t-1}/\text{Sales}_{t-1}$	14,087	−0.05	0.14	1.00	−6.09	0.92
$\text{R\&D}_{t-1}/\text{Assets}_{t-1}$	14,087	0.04	0.00	0.07	0.00	0.35
R&D Dummy	14,087	0.45	0.00	0.50	0.00	1.00
$\text{Debt}_{t-1}/\text{Assets}_{t-1}$	14,087	0.21	0.16	0.21	0.00	0.85

Panel A summarizes country characteristics. These include the median blockholding share computed in 2005; the median blockholding share computed within one year of the year the firm went public; the anti-self-dealing index drawn from Djankov et al. (2008); Block Premium, which is the mean block premium measure drawn from Dyck and Zingales (2004); Stock Market Turnover, which is the total value of stocks traded as a fraction of shares outstanding taken from La Porta, Lopez-de-Silanes, and Shleifer (2006); and log of per capita GDP expressed in U.S. dollars. Panel B summarizes dependent variables as well as firm-year characteristics used in the firm-level regressions. The Blockholding Share is the percentage of the firm's equity controlled by blockholders; the Decrease in the Blockholding Share Dummy takes the value of 1 if the blockholding share drops by 5%; $(BH/N^*(\Delta N/N)) > 0$ is a dummy equal to 1 when the drop in the blockholding share involves equity issuance; $(BH/N^*(\Delta N/N)) \leq 0$ is a dummy equal to 1 when the drop in the blockholding share is due to block sales; the Increase in Leverage Dummy takes the value of 1 if leverage increases by more than 5%; Change in Net PPE is scaled by average PPE between last year and the current year; Tobin's Q is measured as the ratio of the sum of the market value of equity and the book value of debt to the book value of assets and is lagged and measured at the firm- or industry-year level; stock market returns are measured in local currency terms each year; Net PPE is a firm's net property plant and equipment. EBITDA is a firm's earnings before interest, taxes, and depreciation; R&D refers to research and development expenditures; and the R&D Dummy is equal to 1 for firms that report positive levels of R&D. All scaled variables are winsorized at the 1% and 99% levels.

2. Results

We start by conducting country-level analysis that builds on previous work. We then describe tests of the two main hypotheses relating ownership diffusion to agency costs between minority and majority shareholders and tests of some implications of these hypotheses. The final subsection discusses four alternative hypotheses that could potentially distort our conclusions.

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2.1 Country-level analysis of the dynamic effects of investor protection

We first test for a relation between ownership concentration and investor protection at the country level. Existing cross-country studies indicate that ownership concentration is higher in countries with weaker investor protection, but these studies focus primarily on samples of mature firms.

As a benchmark for our subsequent analysis, and to see if these previous results hold in our data, we isolate a sample of firms that have been public for at least five years in 2005 and run country-level regressions that analyze differences in ownership concentration. These regressions are similar in spirit to those presented in La Porta, Lopez-de-Silanes, and Shleifer (1999); Dyck and Zingales (2004); and other papers.

Panel A of Table 3 shows the results. The dependent variable is the median blockholding share in each country, to capture the ownership concentration of the typical firm. The independent variables are a *Low Legal Protection* dummy, *Stock Market Turnover*, and the *Log of GDP per Capita*. The *Low Legal Protection* dummy is equal to 1 if the anti-self-dealing index takes a value less than the median value for the countries in our sample. *Stock Market Turnover* proxies for market liquidity, and the *Log of GDP per Capita* controls for general differences in country development.

The *Low Legal Protection* dummy in the third column of Table 3 attracts a coefficient of 0.109, implying that the ownership concentration of firms that have been publicly listed for at least five years is approximately 11% higher in countries with weak investor protection as opposed to strong investor protection. *Stock Market Turnover* attracts a coefficient of −0.082, suggesting an independent effect of market liquidity on ownership concentration. This finding is consistent with HPS (2007).

Panel B of Table 3 shows similar tests conducted on a sample of firms that have only recently gone public. We rearrange our data into IPO time, and select the first post-IPO year observation for each firm, as long as it is within one year of the firm's IPO. The dependent variable is the country-median blockholding share. In column 3, the coefficient on the *Low Legal Protection* dummy is not significant, and it is more than 40% smaller than the corresponding coefficient in panel A. In short, there does not appear to be a relation between investor protection and ownership concentration for newly public firms.

To shed light on the contrast between panel A and panel B of Table 3, Figure 2 plots blockholding shares in IPO time for firms in countries with low and high investor protection.[9] The distinction between low and high investor protection is again based on the sample median value of the anti-self-dealing index.

Around the time of the IPO, the median blockholding share is similar in both high- and low-investor-protection countries. Ownership diffuses following an

[9] Figure 2 is created using a dataset formed by merging the S&P data with Datastream, which allows us to identify IPOs. This dataset includes information on 3,025 IPOs; this is slightly more than the primary sample we analyze below because we do not require firms to be in Worldscope.

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Table 3
Country characteristics and blockholdings

Panel A: In 2005, for firms that have been public for at least 5 years

Dependent variable: Blockholding share			
	(1)	(2)	(3)
Constant	1.584	1.582	1.562
	(9.693)***	(9.291)***	(9.126)***
Low Legal Protection	0.098		0.109
	(1.854)*		(2.195)**
Stock Market Turnover		−0.071	−0.082
		(2.723)**	(3.416)***
Log of GDP per Capita	−0.132	−0.121	−0.124
	(6.847)***	(6.305)***	(6.180)***
No. of obs.	34	34	34
R-squared	0.476	0.456	0.530

Panel B: Immediately following IPO

Dependent variable: Blockholding share			
	(1)	(2)	(3)
Constant	1.236	1.238	1.227
	(6.832)***	(7.363)***	(6.570)***
Low Legal Protection	0.0562		0.0617
	(1.050)		(1.162)
Stock Market Turnover		−0.035	−0.041
		(0.790)	(1.169)
Log of GDP per Capita	−0.078	−0.072	−0.074
	(3.742)***	(3.691)***	(3.373)***
No. of obs.	34	34	34
R-squared	0.237	0.223	0.256

Cross-sectional regressions explaining the country-median blockholding share. In panel A, the dependent variable is the median blockholding share computed in 2005 using data on firms that have been public for at least five years. In panel B, the dependent variable is the median blockholding share computed within one year of first listing date. Low Legal Protection is a dummy equal to 1 if the Djankov et al. (2008) anti-self-dealing index is below its sample median of 0.47. Stock Market Turnover is the total value of stocks traded as a fraction of shares outstanding. In panel A, the Log of GDP per Capita is measured in 2005, and in panel B the Log of GDP per Capita is the mean of the log of GDP per capita across IPO year observations for sample firms. Heteroscedasticity-consistent *t*-statistics are shown in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

IPO in countries with strong investor protection, so that the median blockholding share falls from 60% to below 25% after five years. In countries with weak investor protection, however, the median blockholding share remains above 45% five years after firms go public. Figure 2 suggests that differences in ownership concentration observed in prior work are a consequence of differences in how ownership diffuses for public firms in countries with strong and weak investor protection.

Taken together, the results indicate that investor protection has an effect that accumulates through time for firms that have recently gone public. We can estimate this effect more formally by running OLS regressions of the change in blockholdings on a set of country characteristics:

$$-\Delta BHS_{kt} = a + bBHS_{kt-1} + cP_k + dTurnover_k + eLog(GDP)_k + \varepsilon_{kt}, \quad (3)$$

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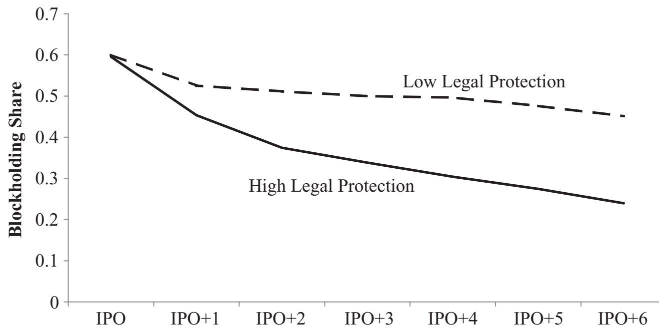

Figure 2
Blockholding shares and investor protection
Median blockholding share of firms in the IPO sample in years relative to their IPO date. The dashed line indicates median values of blockholding ownership shares for firms in countries where the Djankov et al. (2008) anti-self-dealing index is below its sample median of 0.47; the solid line indicates the same measure in countries with an above-median anti-self-dealing index score.

where k indexes the country and t indexes the year, and P measures investor protection. Using data in the IPO sample, the dependent variable is the decrease in the median block ownership share. Specifically, this is the difference in country-median block ownership between two consecutive years, which captures the typical change in ownership concentration for newly public firms. Larger values of the dependent variable imply larger decreases in blockholding. We control for lagged blockholding because large decreases are more common for firms with larger initial levels of blockholding. t-statistics are based on standard errors that are clustered at the country level.

The tests are presented in Table 4, and use the same independent variables as before. Although the coefficient on the *Low Legal Protection* dummy is only marginally significant in the first column, it is significant in the third. The *Low Investor Protection* dummy attracts a coefficient of −0.026, implying that decreases in median blockholding shares are 2.6 percentage points larger in countries with stronger investor protection. The magnitude of this effect is considerably larger than the one percentage point mean decrease in blockholding shares observed in the data.

2.2 Firm-level analysis of the two main hypotheses

In an agency-based theory of corporate ownership, owners trade off the costs of losing control and the benefits of obtaining new capital. A good test of the theory would identify both the costs and the benefits, and thus requires firm-level data. Specifically, in the firm-level data, we can measure firm-level growth opportunities, which are related to the benefits of raising new capital.

To review, our predictions are as follows. If strong investor protection reduces the cost of selling equity (and thus losing control), then firms in countries with high protection levels would be more likely to decrease ownership

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Table 4
Country characteristics and decreases in blockholdings

Dependent variable: Decreases in blockholding share

	(1)	(2)	(3)
Constant	−0.249	−0.239	−0.247
	(3.778)***	(3.568)***	(3.703)***
Blockholding Share_{t-1}	0.196	0.163	0.174
	(4.549)***	(4.745)***	(4.874)***
Low Legal Protection	−0.022		−0.026
	(1.714)*		(2.255)**
Stock Market Turnover		0.015	0.019
		(1.463)	(2.738)***
Log of GDP per Capita	0.019	0.017	0.018
	(3.177)***	(2.792)***	(2.990)***
No. of obs.	349	331	331
R-squared	0.120	0.107	0.125

The dependent variable is the median decrease in blockholdings, as a percentage of shares outstanding, in each country-year. Low Legal Protection is a dummy equal to 1 if the Djankov et al. (2008) anti-self-dealing index is below its sample median of 0.47. Stock Market Turnover is the total value of stocks traded as a fraction of shares outstanding. t-statistics based on standard errors that are clustered at the country level are shown in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

concentration. The impact of investor protection should interact with growth opportunities. Investor protection, therefore, should have larger effects for firms with attractive growth opportunities. These firms have stronger incentives to issue equity, thereby diluting ownership.

We first present some aggregate statistics on the incidence of decreases in the blockholding share across types of countries for firms with different growth opportunities. These data are shown in panel A of Figure 3. In the figure, the bars represent the share of firm-years for which there is a greater than 5% decrease in ownership concentration, shown separately for countries with strong and weak investor protection. Within each group of countries, we sort firm-years by beginning-of-period Tobin's Q. The figure shows that decreases in the blockholding share are more frequent in countries with strong investor protection. Among firms with poor growth opportunities, decreases in the blockholding share are equally prevalent across countries with low and high investor protection. However, among firms with strong growth opportunities, decreases in the blockholding share are particularly prevalent in countries with high investor protection.

To analyze these decreases more formally, our main specification modifies the baseline regression in HPS (2007). As in HPS (2007), the dependent variable is a dummy equal to 1 when the blockholding share decreases by at least 5%. This approach keeps the focus on large changes in ownership structure, rather than, for example, on small changes that arise when managers exercise stock options. It is also appropriate given that hypotheses about the effects of growth opportunities on incentives to share issuance primarily have implications for decreases, rather than increases, in ownership concentration. We estimate probit

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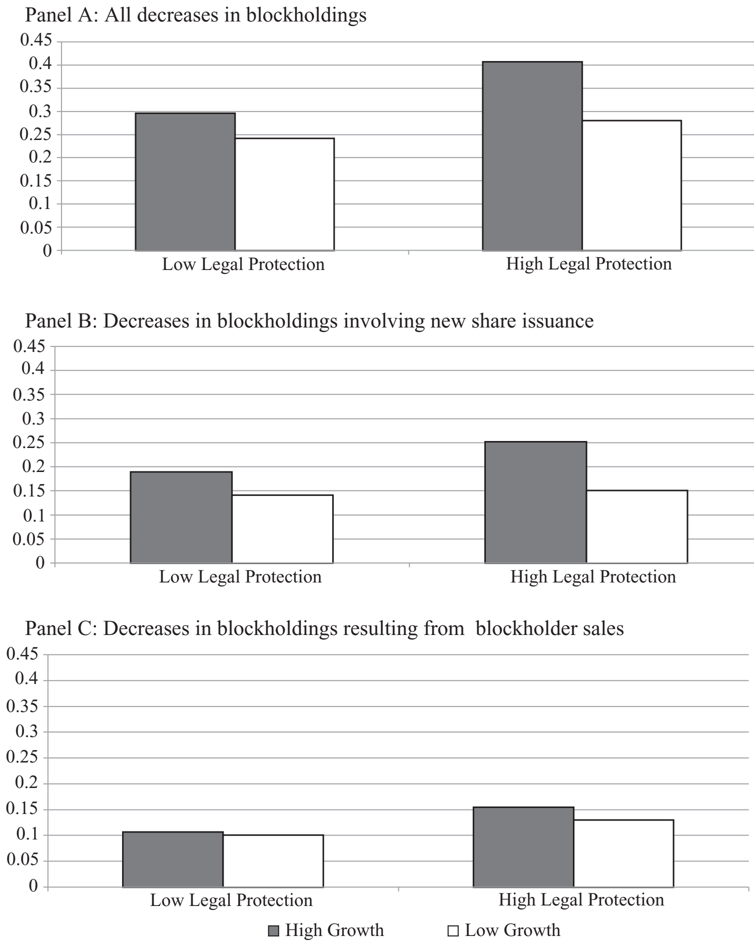

Figure 3
Incidence of decreases in blockholding shares
The incidence of decreases in blockholding shares exceeding 5% for firms facing different growth opportunities shown separately for low- and high-legal-protection countries. Panel A shows the incidence of all decreases; panel B shows the incidence of decreases that involve new share issuance; and panel C shows the incidence of decreases that are solely due to blockholder sales.

regressions forecasting changes in the blockholding share:

$$\Pr((\Delta BHS_{ijkt} < -0.05) = 1) = a + bBHS_{ijkt-1} + cQ_{ijkt} + dP_k + eQ_{ijkt-1} \times P_k + Z_t F + \varepsilon_{ijkt}, \quad (4)$$

where i, j, k, and t denote firm, industry, country, and year, respectively; Q measures growth opportunities; P measures investor protection; and Z is a vector of controls based on HPS (2007). Each specification includes as a control

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Table 5
Growth opportunities and decreases in blockholding shares

	Dependent variable: Decrease in the blockholding share dummy							
	Q = Firm-specific Tobin's Q				Q = Industry Q			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	−1.950	−2.233	−1.911	−1.985	−2.222	−2.253	−1.879	−1.982
	(2.845)***	(3.490)***	(2.114)**	(2.154)**	(3.279)***	(3.300)***	(1.972)**	(2.040)**
Blockholding Share$_{t-1}$	1.257	1.255	1.241	1.239	1.281	1.280	1.266	1.266
	(8.328)***	(8.354)***	(7.896)***	(7.878)***	(8.502)***	(8.540)***	(8.076)***	(8.119)***
Tobin's Q_{t-1}	0.029	0.036	0.029	0.034	0.077	0.089	0.079	0.091
	(2.729)***	(3.974)***	(2.832)***	(3.684)***	(4.117)***	(6.433)***	(4.331)***	(6.845)***
Low Legal Protection	−0.200	−0.114			−0.202	−0.095		
	(2.983)***	(1.285)			(2.981)***	(0.995)		
Low Legal Protection* Tobin's Q_{t-1}		−0.042				−0.055		
		(2.325)**				(2.005)**		
High Block Premium			−0.221	−0.129			−0.226	−0.057
			(2.862)***	(1.295)			(2.771)***	(0.529)
High Block Premium* Tobin's Q_{t-1}				−0.046				−0.086
				(2.619)***				(3.496)***
Stock Market Turnover	0.172	0.172	0.175	0.175	0.171	0.170	0.172	0.174
	(3.645)***	(3.701)***	(3.474)***	(3.521)***	(3.640)***	(3.671)***	(3.408)***	(3.471)***
Lagged Firm-Level Stock Returns	0.070	0.070	0.068	0.068	0.077	0.077	0.074	0.074
	(5.697)***	(5.760)***	(5.575)***	(5.627)***	(6.322)***	(6.277)***	(5.984)***	(5.885)***
Log Assets$_{t-1}$	−0.082	−0.082	−0.085	−0.086	−0.085	−0.086	−0.089	−0.089
	(5.790)***	(5.845)***	(5.517)***	(5.572)***	(5.715)***	(5.725)***	(5.571)***	(5.596)***
Net PPE$_{t-1}$/Assets$_{t-1}$	−0.137	−0.138	−0.145	−0.145	−0.103	−0.103	−0.111	−0.109
	(2.326)**	(2.357)**	(2.558)**	(2.547)**	(1.569)	(1.595)	(1.703)*	(1.686)*
EBITDA$_{t-1}$/Sales$_{t-1}$	−0.042	−0.041	−0.043	−0.042	−0.032	−0.031	−0.032	−0.032
	(3.799)***	(3.655)***	(3.955)***	(3.832)***	(3.254)***	(3.144)***	(3.421)***	(3.358)***
R&D$_{t-1}$/Assets$_{t-1}$	0.021	0.016	0.001	−0.008	−0.064	−0.079	−0.082	−0.102
	(0.090)	(0.068)	(0.004)	(0.035)	(0.258)	(0.325)	(0.344)	(0.438)
R&D Dummy$_{t-1}$	0.098	0.094	0.097	0.095	0.079	0.075	0.078	0.074
	(2.188)**	(2.102)**	(2.162)**	(2.098)**	(1.786)*	(1.685)*	(1.767)*	(1.679)*
Debt$_{t-1}$/Assets$_{t-1}$	0.222	0.222	0.218	0.217	0.234	0.234	0.234	0.231
	(1.383)	(1.392)	(1.376)	(1.380)	(1.513)	(1.518)	(1.516)	(1.514)
Log of GDP per Capita	0.187	0.190	0.188	0.195	0.184	0.186	0.178	0.187
	(3.403)***	(3.406)***	(2.452)**	(2.483)**	(3.250)***	(3.236)***	(2.248)**	(2.289)**
No. of obs.	12,248	12,248	12,023	12,023	12,330	12,330	12,100	12,100
Log likelihood	−7,154	−7,151	−7,026	−7,023	−7,189	−7,187	−7,059	−7,055

Probit specifications explaining decreases in blockholding shares. The dependent variable is a dummy that takes the value of 1 when the blockholding share decreases by more than 5%. Low Legal Protection is a dummy equal to 1 if the Djankov et al. (2008) anti-self-dealing index is below its sample median. High Block Premium is a dummy equal to 1 if the block premium, as measured in Dyck and Zingales (2004), exceeds its sample median. In columns 1–4, Tobin's Q is measured as the ratio of the sum of the market value of equity and the book value of debt to the book value of assets, and in columns 5–8, it is measured by taking means of this ratio across all firms in the same industry and year. Stock Market Turnover is the total value of stocks traded as a fraction of shares outstanding. Lagged Firm-Level Stock Returns are in local currency terms. Net PPE is a firm's net property plant and equipment. EBITDA is a firm's earnings before interest, taxes, and depreciation. R&D refers to research and development expenditures, and the R&D Dummy is equal to 1 for firms that report positive levels of R&D. Each specification includes year fixed effects. z-statistics based on standard errors that are clustered at the country level are shown in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

the blockholder share at the start of the year (BHS_{t-1}), because firms with a high blockholder share are more likely to experience declines (in the limit, it is not possible for firms that have no blockholders to experience decreases in block ownership). We also include year fixed effects, as well as the log of GDP per capita, in an effort to isolate the effects of investor protection as distinct from overall financial development. Standard errors are clustered by country.

Table 5 shows the results. The 0.029 coefficient on lagged Tobin's Q in the first column implies that a one-standard-deviation increase in a firm's investment opportunities from its mean, keeping all other variables at their mean, increases the likelihood of a large drop in the blockholding share by

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2.1 percentage points. The negative and significant coefficient on the *Low Legal Protection* dummy and the positive and significant coefficient on *Stock Market Turnover* are consistent with our earlier country-level findings. Moving from a low- to a high-investor-protection country increases the probability of a decrease in the blockholding share by 6.9 percentage points. The regression in the first column of Table 5 is essentially the firm-level analog of the regressions in Table 4, subjected to additional controls.

We next estimate how ownership changes in response to investment opportunities, and specifically how this sensitivity varies across countries. We include in our regression the interaction of lagged Tobin's Q with our investor protection dummy variable. The results appear in the second column. The interaction term is negative and significant. The 0.036 coefficient on lagged Tobin's Q, together with the -0.042 coefficient on the interaction term, implies that decreases in blockholdings occur when growth opportunities are high, but only in countries with strong investor protection. The differences between the first two columns suggest that the effects of being in a country with strong investor protection operate through differences in the way firms respond to growth opportunities.

The next two columns of Table 5 vary the proxy for investor protection. Here we use a dummy variable that is equal to 1 for countries in which the block premium as measured by Dyck and Zingales (2004) is above the median across countries in our sample. The -0.221 coefficient on this variable in column 3 implies that moving from a country with a high block premium to a country with a low block premium increases the probability of a decrease in the block ownership share by about 7.6 percentage points. Column 4 shows that when we include the interaction of the *High Block Premium* dummy variable with lagged Tobin's Q, the coefficient is negative and significant. Thus, we get broadly similar results using this other measure of investor protection. In columns 5–8, we replace the firm-specific measures of Tobin's Q with an industry measure of Tobin's Q. The results are again similar.[10]

The results in Table 5 suggest that liquidity has an effect on ownership diffusion that is independent from the effects of shareholder protection. In the first column, *Stock Market Turnover* attracts a coefficient of 0.172, implying that a one-standard-deviation increase in stock market turnover is associated with a 3.2 percentage point increase in the probability of a drop in the blockholding share. The effects of many of the firm-level controls included in Table 5 resemble those estimated in HPS (2007). Results in both papers indicate that lower asset tangibility (as measured by net PPE/Assets) and lower levels of internally generated funds (as measured by EBITDA/Sales) are associated with a greater likelihood of firms becoming widely held. According to both sets of estimates, leverage does not have robust effects on the probability of a decrease in ownership concentration. Our coefficient estimates on *R&D/Assets*

[10] Similar results obtain if one uses a broader sample of firms that includes IPOs since 1990 and relaxes the restriction that ownership be measured soon after IPO.

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and the *R&D Dummy* variable have the opposite sign of those in HPS (2007), although only the coefficients on the *R&D Dummy* are significant. HPS (2007) present mixed results on the effects of size, but the coefficients on lagged log assets are consistently negative in our results. This may reflect that larger firms require larger dollar value changes in ownership to exceed the 5% decrease in blockholding ownership shares used to define the dependent variable.

The additional right-hand-side variables in Table 5 serve two purposes. First, they help control for firm-level characteristics, apart from Q, that might affect blockholders' willingness to sell shares and grow. Second, as discussed in Section 2.4, they control for differences in the types of firms that go public in different countries. In our data, at the time they go public, firms in countries with weak investor protection are larger, more profitable, and less R&D intensive than firms in countries with strong investor protection. By including these characteristics on the right-hand side of the regression, we reduce concerns about the effects of these differences.

What drives changes in the blockholding share? By definition, changes in the blockholding share occur because of changes in shares outstanding, or because of blockholding sales. HPS (2007) decompose the percentage change as follows:

$$\Delta BHS_t = \Delta\left(\frac{BH_t}{N_t}\right) = \frac{\Delta BH_t}{N_{t-1}} - \frac{BH_t}{N_t} \times \frac{\Delta N_t}{N_{t-1}}, \qquad (5)$$

where BH denotes the split-adjusted shares held by blockholders, and N denotes shares outstanding. The first term on the right-hand side of Equation (5) captures changes in the blockholding share coming from blockholder sales. The second term captures the change in the block ownership share coming from share issuance.[11] The second term is itself composed of two terms: the percentage change in N and a scaling factor that accounts for the fact that the dilution is a linear function of initial blockholdings. For example, in the extreme case where initial blockholdings are zero, changes in shares outstanding are irrelevant for the block ownership share.

Our hypotheses concerning ownership dilution suggest that decreases in ownership concentration that are a response to investment opportunities should involve new share issuance and not just blockholder sales. Agency considerations predict that firms should raise additional equity to finance growth opportunities in countries where investor protection is strong. With respect to block sales, the predictions are less clear: in countries with good investor protection, blockholders should be willing to sell more overall, but there is no obvious interaction with investment opportunities. Blockholder sales, by themselves, do not raise additional capital.

[11] Share issuance can be due to secondary offerings or stock-based M&A. See Rossi and Volpin (2004) and Kim (2007) for details on the incidence of each across countries.

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We sort incidents in which the blockholding share drops by 5% or more into two groups: those that are due to blockholder sales and those that are due to share issuance. We code a dummy variable equal to 1 if the decrease in the blockholding share is greater than 5% and if the second term on the right-hand side of Equation (5) is positive. Thus, the dummy captures incidents in which a decrease in the blockholding share is at least partially driven by new issuance. We also code a dummy variable equal to 1 if the decrease in the blockholding share is greater than 5% and if the second term on the right-hand side of Equation (5) is zero or negative. This variable captures decreases in ownership concentration that are driven by blockholder sales without additional equity issuance. By definition, these two dummy variables add up to the dummy variable analyzed in panel A of Figure 3 and Table 5.

Panels B and C of Figure 3 illustrate the extent to which decreases in the blockholding share can be attributed to new issues or to block sales. We first sort firms into groups based on the level of investor protection in their country. Within each of these groups, we sort again based on Tobin's Q at the start of the year. Panel B shows the percentage of incidents, within each of the four groups, in which the blockholding share falls in part due to share issuance. Panel C shows the percentage of incidents, within each of the four groups, in which the blockholding share falls due to blockholder sales. Note that the bars in each group in panels B and C add up to equal the bars in panel A.

This decomposition affords several observations: First, decreases in ownership concentration that involve share issuance are more common than decreases that are solely due to block sales. This can be seen by comparing the levels of the bars in panel B to the levels of the bars in panel C. Second, panel B shows that firms with better growth opportunities are more likely to issue shares, and the effect of growth opportunities is larger in countries where investor protection is strong. Third, panel C shows that decreases in blockholding shares that are a consequence of blockholders selling to diffuse owners do not seem to be much affected by growth opportunities.

More formal analysis is shown in Table 6. We repeat the specification from Table 5 using different dependent variables; the table only shows the main coefficients of interest. In panel A, the dependent variable measures whether the blockholding share changes as a consequence of share issuance. In the first column, the coefficient on Tobin's Q is positive and significant, and the coefficient on *Low Legal Protection* is negative and significant. Thus, firms with better investment opportunities, and firms in countries with stronger investor protection, are more likely to experience decreases in the blockholding share as a consequence of new share issuance. The specification in the second column adds Tobin's Q interacted with *Low Legal Protection*. The coefficient on this term is negative and significant, and the coefficient on *Low Legal Protection* on its own becomes insignificant. Thus, in countries with strong investor protection, firms are more likely to become widely held because they are issuing equity to pursue growth opportunities. Columns 2 and 3 repeat these

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Table 6
Share issuance versus block sales

Panel A: Blockholding share decreases which are the result of share issuance

	Dependent variable: Decrease in the blockholding share dummy where $(BH/N^*(\Delta N/N)) > 0$							
	Q = Firm-specific Tobin's Q				Q = Industry Q			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Blockholding Share$_{t-1}$	1.761	1.759	1.763	1.761	1.783	1.782	1.786	1.785
	(9.874)***	(9.913)***	(9.850)***	(9.834)***	(9.565)***	(9.597)***	(9.542)***	(9.578)***
Tobin's Q_{t-1}	0.025	0.033	0.024	0.029	0.081	0.092	0.083	0.094
	(2.746)***	(5.617)***	(2.713)***	(4.134)***	(4.839)***	(7.548)***	(5.077)***	(8.337)***
Low Legal Protection	−0.143	−0.032			−0.142	−0.043		
	(2.492)**	(0.415)			(2.431)**	(0.496)		
Low Legal Protection*Tobin's Q_{t-1}		−0.052				−0.049		
		(3.096)***				(1.552)		
High Block Premium			−0.187	−0.078			−0.187	−0.017
			(2.883)***	(0.928)			(2.698)***	(0.194)
High Block Premium*Tobin's Q_{t-1}				−0.052				−0.085
				(3.326)***				(2.818)***
No. of obs.	12,217	12,217	11,992	11,992	12,299	12,299	12,069	12,069
Log likelihood	−5,338	−5,334	−5,239	−5,236	−5,359	−5,357	−5,258	−5,255

Panel B: Blockholding share decreases which are the result of block sales

	Dependent variable: Decrease in the blockholding share dummy where $(BH/N^*(\Delta N/N)) \leq 0$							
	Q = Firm-specific Tobin's Q				Q = Industry Q			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Blockholding Share$_{t-1}$	0.017	0.018	−0.009	−0.009	0.028	0.028	0.003	0.003
	(0.218)	(0.221)	(0.117)	(0.115)	(0.381)	(0.375)	(0.039)	(0.037)
Tobin's Q_{t-1}	0.007	0.006	0.008	0.007	0.015	0.019	0.015	0.018
	(0.819)	(0.621)	(0.864)	(0.815)	(1.133)	(1.396)	(1.144)	(1.351)
Low Legal Protection	−0.126	−0.142			−0.130	−0.094		
	(2.150)**	(1.725)*			(2.243)**	(1.090)		
Low Legal Protection*Tobin's Q_{t-1}		0.008				−0.019		
		(0.427)				(0.853)		
High Block Premium			−0.115	−0.119			−0.123	−0.082
			(1.780)*	(1.380)			(1.866)*	(0.899)
High Block Premium*Tobin's Q_{t-1}				0.002				−0.021
				(0.102)				(0.847)
No. of obs.	12,217	12,217	11,992	11,992	12,299	12,299	12,069	12,069
Log likelihood	−4,693	−4,693	−4,602	−4,602	−4,724	−4,724	−4,634	−4,634

Probit specifications explaining decreases in blockholding shares that are the result of new share issuance and, alternatively, blockholder sales. In panel A, the dependent variable is a dummy that takes the value of 1 when the blockholding share decreases by more than 5%, and this decrease is partially a consequence of new share issuance. In panel B, the dependent variable is equal to 1 for decreases in blockholdings that are entirely a consequence of blockholders selling shares. Low Legal Protection is equal to 1 if the Djankov et al. (2008) anti-self-dealing index is below its sample median. High Block Premium is a dummy equal to 1 if the Dyck and Zingales (2004) block premium exceeds its sample median. In columns 1–4 of each panel, Tobin's Q is measured as the ratio of the sum of the market value of equity and the book value of debt to the book value of assets, and in columns 5–8, it is the mean of this ratio across all firms in the same industry-year. Unreported control variables include Stock Market Turnover, lagged stock returns, the log of lagged assets, the lagged net PPE to assets ratio, the lagged EBITDA to sales ratio, the lagged R&D to assets ratio, a lagged R&D dummy, the lagged ratio of debt to assets, the log of GDP per capita, and a constant. Stock Market Turnover is the total value of stocks traded as a fraction of shares outstanding. Lagged Stock Returns are in local currency and are measured at the firm level. Net PPE is a firm's net property plant and equipment. EBITDA is a firm's earnings before interest, taxes, and depreciation; R&D refers to research and development expenditures; and the R&D Dummy is equal to 1 for firms that report positive levels of R&D. Each specification includes year fixed effects. z-statistics based on standard errors that are clustered at the country level are shown in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

tests using our alternative measure of investor protection, and columns 4–8 replace firm-specific measures of Tobin's Q with industry-specific measures. Although the statistical significance is weaker in column 6, the basic effects remain.

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The dependent variable used in panel B of Table 6 is a dummy variable that is equal to 1 if the decrease in the blockholding share is greater than 5% and driven by block sales alone. The negative coefficients on *Low Legal Protection* in columns 1 and 5 and *High Block Premium* in columns 3 and 7 indicate that decreases in the blockholding share, which are a consequence of blockholders selling to diffuse owners, are more common in countries with strong investor protection. However, in the even-numbered columns in Table 6, the coefficients on investor protection interacted with measures of growth opportunities are insignificant. Thus, decreases in the blockholding share that are a consequence of blockholders selling their stakes are more common in countries with strong investor protection, but they do not reflect a response to growth opportunities.

Although they are not reported in Table 6, we turn briefly to the control variables. *Stock Market Turnover* is significant in all of the regressions in panel A, but it not enter significant in panel B. When looking only at incidents where blockholders sell without changes in shares outstanding, we do not find any relation with past stock returns. The coefficient on leverage is positive and significant in the specifications in panel A, but not in panel B. This is consistent with the view that firms with high leverage lack access to additional debt and are likely to finance growth with newly issued equity instead.

2.3 Implications for financing choices and growth patterns

When faced with investment opportunities, firms in countries with weak investor protection are reluctant to issue new shares and dilute blockholders. Perhaps these firms rely more heavily on debt financing, allowing blockholders to maintain effective control, while still raising some capital. We consider this possibility here.

We keep the analysis close in spirit to our baseline specifications. We define the dependent variable as a dummy equal to 1 if leverage, defined as the ratio of the book value of debt to assets, increases by more than five percentage points.[12] The regressions that follow use industry-specific measures of Tobin's Q to proxy for growth opportunities.

The results in columns 1 and 3 of Table 7 show that increases in leverage are not significantly related to growth opportunities and furthermore appear unrelated to investor protection. When interactions of weak investor protection proxies and Tobin's Q are included, however, as in columns 2 and 4, the coefficient on these interactions is positive and significant. Thus, firms in countries with weak investor protection tend to increase leverage more than firms in countries with strong investor protection when growth opportunities are attractive.

A number of papers document a relation between financial development and country-, industry-, and firm-level growth. Levine (2005) surveys this work.

[12] Similar results obtain if one analyzes continuous measures of leverage increases in a Tobit specification.

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Table 7
Growth opportunities and increases in leverage

Dependent variable: Increase in the leverage dummy

	(1)	(2)	(3)	(4)
Constant	−0.261	−0.222	0.162	0.268
	(0.473)	(0.399)	(0.325)	(0.531)
Blockholding Share$_{t-1}$	−0.171	−0.170	−0.151	−0.150
	(2.647)***	(2.584)***	(2.651)***	(2.606)***
Tobin's Q_{t-1}	0.010	−0.006	0.009	−0.006
	(1.005)	(0.486)	(0.966)	(0.538)
Low Legal Protection	0.064	−0.068		
	(1.374)	(0.969)		
Low Legal Protection*Tobin's Q_{t-1}		0.067		
		(2.808)***		
High Block Premium			0.011	−0.179
			(0.189)	(1.814)*
High Block Premium*Tobin's Q_{t-1}				0.096
				(3.037)***
Stock Market Turnover	0.097	0.099	0.091	0.090
	(1.850)*	(1.972)**	(2.143)**	(2.233)**
Lagged Firm-Level Stock Returns	−0.027	−0.028	−0.028	−0.029
	(1.039)	(1.060)	(1.070)	(1.095)
Log Assets$_{t-1}$	−0.002	−0.001	−0.004	−0.003
	(0.114)	(0.056)	(0.196)	(0.155)
Net PPE$_{t-1}$/Assets$_{t-1}$	0.301	0.301	0.289	0.285
	(2.814)***	(2.776)***	(2.620)***	(2.536)**
EBITDA$_{t-1}$/Sales$_{t-1}$	−0.065	−0.066	−0.064	−0.065
	(3.904)***	(4.036)***	(3.783)***	(3.826)***
R&D$_{t-1}$/Assets$_{t-1}$	−0.592	−0.565	−0.597	−0.562
	(1.257)	(1.233)	(1.274)	(1.238)
R&D Dummy$_{t-1}$	−0.181	−0.177	−0.174	−0.170
	(4.943)***	(4.790)***	(4.537)***	(4.440)***
Debt$_{t-1}$/Assets$_{t-1}$	−0.114	−0.114	−0.112	−0.109
	(1.161)	(1.159)	(1.121)	(1.091)
Log of GDP per Capita	−0.048	−0.050	−0.109	−0.117
	(0.935)	(0.970)	(2.563)**	(2.645)***
No. of obs.	11,055	11,055	10,861	10,861
Log likelihood	−5,052	−5,048	−4,972	−4,967

Probit specifications explaining increases in leverage. The dependent variable is a dummy that takes the value of 1 when leverage, defined as the ratio of the book value of debt to the book value of assets, increases by more than 5%. Low Legal Protection is a dummy equal to 1 if the Djankov et al. (2008) anti-self-dealing index is below its sample median. High Block Premium is a dummy equal to 1 if the block premium, as measured in Dyck and Zingales (2004), exceeds its sample median. Tobin's Q is measured as the ratio of the sum of the market value of equity and the book value of debt to the book value of assets, taking means of this ratio across all firms in the same industry and year. Stock Market Turnover is the total value of stocks traded as a fraction of shares outstanding. Lagged Stock Returns are in local currency terms and are measured at the firm level. Net PPE is a firm's net property plant and equipment. EBITDA is a firm's earnings before interest, taxes, and depreciation. R&D refers to research and development expenditures, and the R&D Dummy is equal to 1 for firms that report positive levels of R&D. Each specification includes year fixed effects. z-statistics based on standard errors that are clustered at the country level are shown in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Even though we find that firms in countries with weak shareholder protection substitute toward debt to finance growth opportunities, this substitution may not make up for the decline in equity financing. That is, firms in these countries could raise less financing overall, and invest less. While it is not our intention to reinvent the wheel in the extensive finance and growth literature, we can use our main specification from Table 7 to understand the determinants of investment.

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Table 8
Growth opportunities and investment

Dependent variable: Change in net PPE

	(1)	(2)	(3)	(4)
Constant	0.666	0.647	0.611	0.585
	(6.076)***	(5.742)***	(5.700)***	(5.228)***
Blockholding Share_{t-1}	0.098	0.098	0.097	0.097
	(3.050)***	(3.083)***	(2.860)***	(2.869)***
Tobin's Q_{t-1}	0.035	0.042	0.034	0.037
	(5.555)***	(12.107)***	(5.181)***	(6.621)***
Low Legal Protection	−0.037	0.023		
	(4.403)***	(1.354)		
Low Legal Protection*Tobin's Q_{t-1}		−0.031		
		(3.646)***		
High Block Premium			−0.036	0.005
			(3.185)***	(0.303)
High Block Premium*Tobin's Q_{t-1}				−0.022
				(2.200)**
Stock Market Turnover	0.032	0.032	0.033	0.033
	(4.607)***	(4.043)***	(3.861)***	(3.722)***
Lagged Firm-Level Stock Returns	0.039	0.039	0.040	0.040
	(6.573)***	(6.517)***	(6.867)***	(6.819)***
Log Assets_{t-1}	−0.019	−0.020	−0.019	−0.019
	(2.981)***	(3.052)***	(2.875)***	(2.920)***
Net $\text{PPE}_{t-1}/\text{Assets}_{t-1}$	−0.105	−0.105	−0.102	−0.102
	(4.280)***	(4.269)***	(3.967)***	(3.922)***
$\text{EBITDA}_{t-1}/\text{Sales}_{t-1}$	0.028	0.028	0.027	0.028
	(7.767)***	(7.712)***	(8.134)***	(8.150)***
$\text{R\&D}_{t-1}/\text{Assets}_{t-1}$	−0.696	−0.704	−0.691	−0.696
	(9.471)***	(9.806)***	(9.151)***	(9.330)***
R&D Dummy_{t-1}	−0.009	−0.011	−0.007	−0.008
	(1.253)	(1.592)	(1.009)	(1.122)
$\text{Debt}_{t-1}/\text{Assets}_{t-1}$	−0.095	−0.096	−0.097	−0.097
	(2.682)**	(2.718)**	(2.710)**	(2.746)**
Log of GDP per Capita	−0.025	−0.024	−0.019	−0.017
	(3.141)***	(2.903)***	(2.163)**	(1.907)*
No. of obs.	12,308	12,308	12,084	12,084
R-squared	0.111	0.113	0.110	0.111

The table reports OLS specifications explaining net capital investment. The dependent variable is the change in net PPE scaled by the average of beginning and end of period values. Net PPE is a firm's net property plant and equipment. Low Legal Protection is a dummy equal to 1 if the Djankov et al. (2008) anti-self-dealing index is below its sample median. High Block Premium is a dummy equal to 1 if the mean block premium, as measured in Dyck and Zingales (2004), exceeds its sample median. Tobin's Q is the ratio of the sum of the market value of equity and the book value of debt to the book value of assets, taking means of this ratio across all firms in the same industry and year. Stock Market Turnover is the total value of stocks traded as a fraction of shares outstanding. Lagged Firm-Level Stock Returns are in local currency terms. EBITDA is a firm's earnings before interest, taxes, and depreciation. R&D refers to research and development expenditures, and the R&D Dummy is equal to 1 for firms that report positive levels of R&D. Each specification includes year fixed effects. *t*-statistics based on standard errors that are clustered at the country level are shown in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Investment is measured as the change in net PPE scaled by average net PPE over the year.

These tests are shown in Table 8. Investment is higher for firms in industries with higher Tobin's Q, and lower for firms in countries with poor investor protection. The coefficients on the interactions terms in columns 2 and 4. The coefficients imply that the sensitivity of investment to investment opportunities is greater for firms in countries with strong investor protection.

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In unreported regressions, we find nearly identical results for asset growth, a broader measure of total investment. These results are reminiscent of Demirgüç-Kunt and Maksimovic (1998) and Rajan and Zingales (1998). In summary, the type of firms that are particularly likely to become widely held—those that face attractive growth opportunities and are in countries with strong investor protection—grow.

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3. Alternative hypotheses explaining the diffusion of ownership

We have focused so far on agency-based explanations of the trade-off between maintaining control and obtaining capital. Other explanations could play a role in explaining the diffusion of ownership, and their effects could distort the findings discussed above. Here we consider four such alternatives.

3.1 Market timing

One alternative theory that may explain the dynamics of ownership more generally is market timing. Blockholders and managers might attempt to time the equity market, by issuing new shares or selling existing shares when prices are high. Consistent with this, our results in Table 5 confirm that decreases in the blockholding share are more likely following high stock returns. The 0.070 coefficient on lagged firm-level stock returns in the first column of Table 5 implies that a one-standard-deviation increase in this variable is associated with a 2.2 percentage point greater likelihood of a decrease in the blockholding share. However, as indicated in Table 6, past returns operate through decreases in the blockholding share, only when it involves new share issues, not sales by blockholders. The coefficient on lagged firm returns is negative and insignificant in explaining decreases in the blockholding share that are a consequence of blockholder sales to diffuse owners. This result casts doubt on market timing explanations, because blockholders stand to gain more from timing the sale of their own shares, as compared to the gain from new issues, in which they benefit only if net issuance is large relative to shares outstanding. We also find that decreases in blockholding shares are not predictive of low future returns (not reported).[13] Taken together, these results suggest that decreases in blockholding shares take place when past returns and current valuations are high, but these decreases do not predict that firm valuations in the marketplace will revert to lower levels. In sum, market timing receives only limited support.

3.2 Stock market liquidity

Liquidity would have an effect on ownership concentration if insiders are more willing to sell shares when the price impact of doing so is smaller. When applied

[13] We have also conducted tests similar to those in the even-numbered columns of Table 5 but which additionally include past returns and future returns over a one-year horizon, as well as the interactions of these variables with measures of investor protection. None of these interaction terms is significant, and their inclusion does not have a substantive effect on the interaction of measures of Tobin's Q with investor protection.

to our data, the liquidity theory has a straightforward prediction: decreases in ownership concentration should be more common when the stock trades in a more liquid market. Consistent with this prediction and with HPS (2007), Table 5 shows that decreases in blockholding shares are more likely in countries with liquid markets. We also replicate the results in Table 5 using a firm-level measure of turnover, getting similar results to HPS (2007).

If market liquidity is correlated with investor protection, the coefficient on the interaction terms in Table 5 could indicate how ownership concentration responds differently to investment opportunities in countries with different levels of liquidity. We address this possibility by including measures of Tobin's Q interacted with measures of liquidity in our main tests. The coefficient on this interaction term is insignificant, and its inclusion does not have a material impact on the coefficients on the interactions of Tobin's Q with measures of investor protection. However, the coefficient on the interaction term (i.e., from column 6 of Table 5) becomes slightly smaller in magnitude and insignificant. In summary, while liquidity appears to affect the diffusion of ownership, it does so independently of investor protection.

3.3 Characteristics at IPO

The characteristics of firms going public may differ across countries, and these characteristics could affect estimates of the importance of institutions. The consequences of selling shares to diffuse shareholders in countries with weak investor protection might make some firms less likely to go public in such environments.[14] To consider this possibility, Table 9 presents mean firm-specific characteristics for firms within a year of first listing, dividing the sample on the basis of the legal protection of investors. The first column displays means for firms in countries where the legal protection of investors is low, the second column for firms where it is high, and the third column gives the difference and shows whether the difference is statistically significant.

Newly public firms in countries with low legal protection appear to have higher assets, higher ratios of EBITDA to sales, and to be less R&D intensive (they report lower ratios of R&D to assets and are more likely to report R&D expenditures). Our regressions control for these characteristics, and the results in Table 5 suggest that larger, more profitable firms are less likely to experience decreases in blockholder shares. Therefore, the characteristics of newly public firms in countries with weak investor protection do affect the diffusion of ownership. However, the effects of size, profitability, R&D intensiveness, and measures of investment opportunities operate independently from

[14] A related alternative explanation for our findings is that the optimal ownership structure differs across young and old firms, and this difference depends on the level of investor protection. This may occur if, for example, it becomes more difficult to extract private benefits as the firm gets older in regimes where investor protection is strong. To consider this possibility, we include the number of years since a firm went public and its interaction with measures of investor protection in the specifications from the even-numbered columns of Table 5. These adjustments have no effect on our inferences.

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Table 9
Differences in firm characteristics at time of IPO

	Low-legal-protection countries	High-legal-protection countries	Difference
Tobin's Q	2.388	3.077	−0.688
			(0.393)*
Log Assets	13.543	13.003	0.540
			(0.156)***
Net PPE/Assets	0.330	0.242	0.088
			(0.065)
EBITDA/Sales	0.147	−0.283	0.430
			(0.159)**
R&D/Assets	0.012	0.033	−0.021
			(0.007)***
R&D Dummy	0.328	0.464	−0.136
			(0.062)**
Debt/Assets	0.212	0.204	0.008
			(0.024)

Mean values of firm characteristics within a year of first listing. The table shows means for firms in countries with Low Legal Protection, High Legal Protection, and the difference. Low Legal Protection is a dummy equal to 1 if the Djankov et al. (2008) anti-self-dealing index is below its sample median. Tobin's Q is the ratio of the sum of the market value of equity and the book value of debt to the book value of assets. Net PPE is a firm's property plant and equipment. EBITDA is a firm's earnings before interest, taxes, and depreciation. R&D refers to research and development expenditures, and the R&D Dummy is equal to 1 for firms that report positive levels of R&D. t-statistics for the test of the significance of the difference in means based on standard errors that are clustered at the country level are shown in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

measures of investor protection, and independently from the interaction of investor protection with investment opportunities.

3.4 Country differences in growth opportunities

Growth opportunities might have differed across countries during our sample period in a way that is correlated with investor protection. The tests presented in Table 5 directly control for growth opportunities using Tobin's Q, and the results indicate that firms with higher Tobin's Q are more likely to experience decreases in the share of ownership owned by blockholders. Additional analysis indicates that measures of Tobin's Q and investor protection pick up independent effects. In specifications that include both variables, dropping either one does not change the coefficient on the other much. However, growth opportunities could conceivably have been better than measured in countries with strong investor protection, for example. It is possible to see if our estimates of the effect of the interaction of investment opportunities with investor protection are robust to this concern by including country-year fixed effects in the specifications presented in Table 5. Tests including these effects identify the impact of investor protection by comparing, across investor protection regimes, within country differences in the extent to which block ownership falls for firms with different relative levels of growth opportunities. Country differences in growth opportunities are absorbed by the fixed effects. In such specifications, the interaction coefficients are similar in magnitude and significance to those presented in Table 5 (not reported).

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4. Conclusions

We study how the structure of corporate ownership of a firm evolves following first listing, and how this evolution varies across countries. Newly public firms have concentrated ownership; the level of concentration does not vary significantly with the level of investor protection. In countries with strong investor protection, however, firms are more likely to experience decreases in the share of ownership of blockholders. Why? In these countries, firms with attractive growth opportunities are more likely to issue equity, diluting their blockholders in the process. Blockholders are also unconditionally more likely to sell. As a result, firms in environments with poor investor protection grow less, and when they do use external finance to fund growth, they lean more heavily on debt. Alternative explanations for the diffusion of ownership receive some support, but they do not distort these basic conclusions about the role of investor protection. The results indicate important connections between ownership concentration and growth and suggest that a dynamic view of corporate ownership is required to fully account for the patterns in the data. Our main observation is that firms become widely held in large part because they grow.

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