Competition and Private Benefits of Control *

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- Abstract -

This paper investigates the impact of competition on private benefits of control (PBC). To test for the effect of competition on private benefits, we use two indexes that measure the level of product and input market anti-competitive regulations. We estimate PBC using the voting premia between shares with differential voting rights. Using a panel dataset of 586 firms in 16 countries, our main findings are three. First, within-country increases in the intensity of competition lead to lower estimates of private benefits of control. Second, competition significantly reduces the dispersion in private benefits. Third, the reduction in the level and dispersion of PBC that result from competition are particularly prominent in weak-rule-of-law countries, in manufacturing industries and in less-profitable firms. Overall, our results suggest that product market competition can help in curbing private benefits of control.

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"Monopoly is a great enemy to good management"

Adam Smith (1776)

I. Introduction

A widespread view in finance and economics is that competition improves efficiency. Yet, this disciplining force is often overlooked in the corporate governance literature.[1] A common argument for the impact of competition on corporate governance is natural selection. Competition, it is argued, would tend to drive inefficient firms out of the market (Alchian, 1950; Stigler, 1958). This threat, according to Shleifer and Vishny (1997), is "probably the most powerful force towards economic efficiency in the world." Competition may also affect the provision of information, crucial for monitoring and relative performance evaluation (Holmstrom, 1982; Nalebuff and Stiglitz, 1983; Hart, 1983). The absence of competition, in contrast, is associated with lower incentives (Hart, 1983; Bertrand and Mullainathan, 2003), greater managerial waste (Leibenstein, 1996), and lower efficiency (Nickell, 1997). As argued by Leibenstein (1966), these inefficiencies may be the *real* costs of monopolies.

While these arguments are appealing, the theoretical foundations for the link between competition and corporate governance have been difficult to establish (Scharfstein, 1988; Holmstrom and Tirole, 1989; Hermalin, 1992; Schmidt, 1997; Raith, 2003; Vives, 2004). For example, in their seminal paper, Jensen and Meckling (1976) argue that owners of monopolistic firms have the same incentives as shareholders in competitive settings to monitor and discipline insiders. In their view, firms would face comparable agency costs irrespective of competition.

The objective of this paper is to empirically investigate the impact of competition on agency costs. More specifically, we examine the effect of product and input market competition on a commonly used measure of the quality of corporate governance: the voting premium between shares with differential voting rights. The relative price of these dual-class shares has been previously used as a measure of the private benefits of control enjoyed by controlling shareholders (Lease, McConnell and Mikkelson, 1983; DeAngelo and DeAngelo, 1985; Rydqvist, 1987; Barclay and Holderness, 1989; Zingales, 1994 and 1995; Nenova, 2003; Doidge, 2004). The logic for using this measure is that, beyond the common cash-flow rights that all investors

[1] See the excellent surveys by Shleifer and Vishny (1997) and Becht, Bolton and Roell (2003). Notable exceptions include Morck, Stangeland, and Yeung (2000), Dyck and Zingales (2004), and, more recently, Giroud and Mueller (2009).

share, higher voting shares confer the ability to affect control contests. If control is valuable, the voting premium could be used to estimate the value of private benefits (Zingales, 1995).[2]

Following Stigler (1963), we test for the two most important predictions of competition as a disciplinary force. These are the effect of competition on: (a) the level of inefficiency in the market place and (b) the dispersion in performance. If competition were to improve governance, we would expect that increasing competition would lead to lower private benefits. In other words, the ability of insiders to redirect corporate resources (Jensen and Meckling, 1976; Zwiebel, 1995) and use inside information for personal gain (Dyck and Zingales, 2004) would decline as competition increases. In consequence, if private benefits of control decline, we would expect the estimated voting premium to fall accordingly.

Similarly, as competitive pressures increase, there would be a tendency to reduce the dispersion in agency costs within countries and industries. This convergence in performance may be driven by lower agency costs in existing firms or, alternatively, by the failure of the most inefficient firms that are driven out of the market. Lower dispersion in the level of managerial waste would imply a lower dispersion in the voting premia between different firms. This pressure towards equality in performance outcomes is, according to Stigler, one of the most important propositions of economic theory.[3] Interestingly, the effect of competition on the dispersion of governance outcomes has not been studied in the literature. As a result, this paper provides, to the best of our knowledge, the first direct test linking competition and the dispersion of governance.

To examine the effect of competition on the level and dispersion of private benefits, we rely on two internationally comparable indexes of product and input market competition. These measures, developed by the Organization for Economic Cooperation and Development (OECD), capture the degree to which government policies limit the scope of competition. The first variable, the product market regulation (*PMR*) index, measures the level of regulation in the final goods markets (Conway, Janod and Nicoletti, 2005). In the empirical analysis, we use this time-varying measure to test whether changes in product markets affect the voting premium.

The second measure, the regulatory impact (*RI*) index, measures the level of restrictions in four strategic industries whose main output is an intermediate input for other industries. The input-producing industries include energy, transport and communications, retail distribution, and financial services. The *RI* index weights input regulations by the importance of each input per

[2] The value of a vote is also determined by the probability that a vote affects the outcome of control contests. In the absence of adequate data to control for such probabilities, the bulk of the empirical analysis of this paper examines within-firm changes in the voting premium, implicitly assuming that the probability of having a pivotal vote is held constant.

[3] Stigler (1963), p.54. See Syverson (2004a) and (2004b) for recent evidence of the effect of competition in reducing the dispersion of productivity within industries.

industry. As a result, each industry has its own measure of input market competition. While the effect of deregulation in the final product market is relatively well understood in the literature, the effect of deregulation in the input markets is less well studied. Recent empirical studies, however, have documented a direct connection between input deregulation and firm entry and growth (Cetorelli and Strahan, 2006; Bertrand, Schoar, and Thesmar, 2007; Francois and Wooton, 2008).

The variation in product and input market competition indexes allows us to test whether *changes* in the levels of competition affect the voting premia. Pre-existing studies have examined the effect of product market competition on governance outcomes using time-invariant measures of competition, such as cross-country variables (Dyck and Zingales, 2004) or industry-wide concentration measures (Giroud and Mueller, 2009). Furthermore, the variation in the product markets and input regulation indexes reflect changes in government actions, which are arguably exogenous to individual firm decision-making, facilitating inference.

To test for competitive effects on the voting premia, we use data on dual-class firms from DATASTREAM and COMPUSTAT Global, with matching competition information from the OECD. To identify dual-class firms, we follow Doidge (2004) in selecting firms with differential voting rights, but with dividends rights that are not independent from each other, between 1990 and 2003. The product market competition index is available for 1998 and 2003. The regulatory impact index is matched to dual-class firms for the 1990 to 2003 sample period. Overall, we use information on 586 dual-class firms in 16 countries.

Our main findings are three.

First, higher levels of competition are correlated with statistically and economically lower estimates of private benefits of control. When we split sample firms into two equally-sized groups as a function of product or input market competition, we show that the most competitive subset exhibits voting premia that are less than half of the estimated ratio for those firms in the least competitive environments. Given that the intensity of competition is likely to be correlated with other country-level characteristics that have been previously shown to affect the level of PBC, we partial out country characteristics using country dummies. We find that holding other country characteristics constant, product market competition in both output and input markets is strongly negatively correlated with the voting premia.

Second, competition is crucial to understanding the dispersion in the estimated private benefits of control. We test for the importance of competition on the dispersion of the voting premia in two steps. We first examine the dispersion in PBC as a function of time-invariant country characteristics and then use quantile regressions to assess whether competition affects the residual dispersion in the voting premia. Interestingly, we document a substantial within-country

and industry dispersion in PBC that is not explained by country-fixed effects. More importantly, we find striking evidence that product and input competition significantly affect the dispersion of PBC. Specifically, we find that competition is critical in limiting private benefits of control in the top quantiles of the PBC distribution. Competition, in contrast, is less effective at reducing the voting premia in the lowest quantiles of the PBC distribution.

Third, we find that changes in the intensity of competition lead to lower estimates of private benefits of control. In terms of inference, this result is important for a number of reasons. It provides the first direct test in the literature that within-firm increases in competition can lead to lower estimates of the private benefits of control. This result establishes that competition can lead to significant improvements in governance institutions and rules out firm turnover as the only driver of efficiency following deregulation events.

We also show that stiffer competition leads to larger disciplinary effects on relatively less-profitable firms, which is consistent with the idea that competition may induce complacent insiders to improve performance. We find that competition, particularly input competition, disproportionally affects manufacturing firms. Our results also highlight that product market competition is arguably a more powerful disciplinary tool than input market deregulation. Yet, deregulation of key input-producing industries can lead to significant spillovers across multiple industries.

Our analysis indicates that the negative relationship between competition and PBC is significantly larger in countries with weaker rule-of-law environments. That the average PBC estimate is lower for firms in high rule-of-law countries is not surprising given the existing literature (Nenova, 2003; Dyck and Zingales, 2004; and Doidge, 2004). The fact that, conditional on a weak legal environment, competition is strongly correlated with lower PBC further suggests that competition can potentially reduce insiders' consumption of private benefits.

Overall, our evidence highlights the importance of competition for the allocation of resources. We provide empirical support for the idea that competition is a unique disciplinary force in the economy and one that has received scant attention in the governance literature. Such evidence indicates that beyond country-level characteristics, such as the countries' legal environments, eliminating anti-competitive regulations can help reduce the level of private benefits of control.

The rest of the paper is organized as follows. Section II describes our empirical strategy and predictions. Section III presents the data on dual-class share firms and the measures of competition used in this paper. Section IV presents our results on the effect of competition on the level and dispersion of PBC. Section V concludes.

II. Empirical Strategy and Predictions

In this section, we briefly outline the main empirical specifications used and describe the main hypotheses linking the intensity of competition and the level and dispersion of private benefits of control. We start by examining the link between competition and private benefits of control within countries. We then move to highlight two novel tests linking competition and PBC: (1) the effect of competition on the dispersion of private benefits and, (2) the effect of changes in the intensity of competition on these PBC. A crucial contribution of this paper is that the source of variation used to test for these direct effects of competition relies on changes in government regulations, which are arguably exogenous to individual firms' decision-making.

A. The Effect of Competition on the Level of Private Benefits of Control

Recent studies provide empirical support to the idea that competition may be a crucial force in corporate governance. Dyck and Zingales (2004), for example, show that country-level measures of product market competition are negatively correlated with the prices paid for controlling blocks, a common proxy for private benefits of control. Similarly, Giroud and Mueller (2009) document that industry-level competition may keep managers incentivized even after the passage of anti-takeover legislation. Specifically, they find that regulations that make takeovers difficult lead to higher wages and costs, but only in concentrated industries.

These studies, however, rely on measures of competition that do not change over time. As a result, they do not provide direct tests for the effect of changing competition on the level of private benefits of control. Dyck and Zingales (2004) use a measure of the level of competitive regulations across countries. Furthermore, the measure of PBC used in the paper—the price paid by controlling blocks—is based on controlling block transactions, which rarely occur more than once in a given firm. The nature of such data makes it difficult to evaluate the effect of competition on within- firm variation in the level of PBC. Giroud and Mueller (2009) proxy competition using the Herfindahl-Hirschman index of concentration across industries in the U.S., but their focus is on measuring the effects of changes in anti-takeover legislation: They look at the level of industry concentration, rather than evaluating the direct effect of competition on their measures of managerial slack.

In this paper, we examine the direct effect of changes in competition on PBC over time. More specifically, we estimate:

$$PBC_{ist} = \alpha + \beta Comp_{st} + X'_{ist}\vartheta + d_c + d_t + \varepsilon_{ist} \qquad (1)$$

where PBC_{ist} are private benefits of control for firm *i,* in industry *s* at time *t,* and $Comp_{st}$ is a proxy for competition at a given industry *s* and year *t* . Country dummies d_c control for any permanent differences across countries that may affect the level of PBC. Time dummies or d_t are included to control for aggregate time trends. If competition has a disciplining effect on firms, we expect β to be negative and significant. That is, the higher the level of competition, the lower the estimated level of private benefits. X'_{ist} is a vector of firm-level characteristics and country-level controls. The firm-level variables control for a set of firm characteristics, including firm size (*ln* of firm assets), growth opportunities (market to book ratio), and profitability (net income to sales). We also include two variables that may affect the voting premium directly: a measure of the relative liquidity of the high and low voting shares (measured as the ratio of the total number of firms traded in a year of each type of share); and the ratio of the dividends per share of the high relative to the low voting rights security.[4] We will also allow for a set of variables to control for time-varying country characteristics (GDP growth, the ratio of the market capitalization of traded securities to GDP, the ratio of foreign direct investment (FDI) to GDP, and unemployment). Given that one could argue that these time-varying firm and country controls are endogenous to changes in competition, it is arguably inappropriate to include them as controls as we cannot separately identify their impact on PBC. Therefore, we do not include those time-varying characteristics in our main and preferred specifications. However, for completeness, we show how our results change with the inclusion of those variables.

Notice that the inclusion of country-fixed effects ensures that the effect of competition is not determined by cross-country variation. Countries differ systematically in an array of ways, and country variation tends to be extremely important empirically (Doidge, Karolyi, and Stulz, 2004). La Porta, Lopez de Silanes, Shleifer and Vishny (1998 and 2000), for example, document important correlations between the degree of investors' legal protection and measures of corporate governance. Roe (2003), however, argues that such cross-country correlations may be driven by other non-legal institutions, such as, product market competition. The use of country fixed-effects allows us to empirically investigate whether competition affects the level and dispersion of private benefits of control, holding country-characteristics, such as their legal origins or other important variables, constant.

[4] Since these control variables are not available for all firms in the sample, we imputed a value of zero to the missing observations and also included dummies for each variable that equals one if the observation had been imputed. In this way, we do not lose observations, but can include the controls. The results are similar if we do not impute the missing observations.

B. Competition and the Dispersion of Private Benefits of Control: Quantile Regressions

As discussed in the introduction, the existing literature linking competition and corporate governance has examined the effect of competitive market forces on the average quality of corporate governance institutions. The effect of competition on the *dispersion* in governance has, thus far, remained unexplored. Such an omission is surprising given that, if competition were to indeed discipline insiders, it would necessarily put a lower bound on the level of inefficiency in the marketplace (Stigler, 1963). Moreover, a number of recent studies have indeed documented that more-competitive markets lead to lower dispersion in terms of output. Syverson (2004a and 2004b), for example, shows a wide dispersion in total factor productivity levels, particularly in less- competitive markets. Lower dispersion in output measures, however, does not necessarily imply lower dispersion in agency costs since agency costs may, for example, be proportional to output.

We test for the effect of competition on the dispersion of private benefits of control using quantile regressions (Koenker and Bassett, 1978; Koenker and Hallock, 2001). Quantile regressions are commonly used to characterize the entire conditional distribution of a dependent variable given a set of exogenous variables or, alternatively, as robustness tests for the importance of extreme observations. The focus on analyzing entire distributions has grown rapidly over time and has been shown to be crucial, for example, in understanding the structure of wages in the United States (Chamberlain, 1994). In the finance literature, however, its use is typically restricted to outlier tests (see, for example, Gompers, Ishi and Metrick, 2003; Santa-Clara and Valkanov, 2003; Almeida, Campello and Weisbach, 2004; Masulis, Wang and Xie, 2007, among others).

In this paper, we use quantile regressions to characterize the entire conditional distribution of private benefits. In other words, we investigate whether increases in the intensity of competition affect the level of private benefits differently for lower or upper quartiles of the PBC distribution, holding other covariates constant. As a result, we can assess whether the PBC distribution is becoming more or less compressed as the level of competition increases for each country or industry. This is in contrast to an ordinary least squares regression (OLS) that solely provides information on the effect of competition on the average level of private benefits.

Formally, we estimate quantile regressions, at the 10^{th}, 25^{th}, 50^{th}, 75^{th} and 90^{th} quantiles (*Q)* of the PBC distribution:

$$PBC_{ist} = \alpha^{Q} + \beta^{Q} Comp_{st} + d^{Q}{}_{c} + d^{Q}{}_{t} + d^{Q}{}_{s} + \varepsilon_{ijt} \qquad (2)$$

The coefficients β^{Q} for each of the selected quantiles tell us the extent to which PBC changes with competition at each selected quantile *Q*. Therefore, by comparing the difference between these estimates, we can assess how the dispersion of private benefits changes with competition. For example, $\beta^{Q=90} - \beta^{Q=10}$ measures the extent to which the distance between the 90th and the 10th percentiles of PBC changes with higher competition. If as Stigler (1963) predicted, competition has a larger negative effect at the 90th than at the 10th quantile, we would expect this difference to be negative. The larger the gap, the larger the decline in dispersion as competition increases. Finally, to test for statistical significance of these effects, we use simultaneous-quantile regressions.

In terms of predictions, we expect that higher levels of competition would lead to significant reductions in the dispersion of PBC. That is, the effect of competition should be more (less) prominent for the upper (lower) quantiles of the PBC distribution.

C. Does Competition Lead to Lower Private Benefits of Control? Firm-level Analysis Using Panel Data

To provide a sharper test for the effect of competition on private benefits of control, we assess whether changes in competition lead to lower PBC. The use of within-country or industry variation in competition allows us to rule out the confounding effect of time-invariant country, industry or firm characteristics, which is a concern in the existing literature.

Furthermore, within-firm tests may help in disentangling the selection and disciplinary effects of competition. Competition can lead to lower PBC whenever businesses in which insiders enjoyed a disproportionate share of private benefits exit the market or if, alternatively, competition induces existing firms to operate more efficiently. The existing total factor productivity literature suggests that both effects may be important. Foster, Haltiwanger, and Krizan (2006), for example, document that productivity gains are explained entirely by entry and exit decisions. Schmitz (2005), in contrast, documents substantial within-firm productivity gains in response to higher competitive pressures.

Formally, we evaluate the following specification:

$$PBC_{ist} = \alpha + \beta Comp_{st} + X'_{ist}\vartheta + d_i + d_t + \varepsilon_{ijt} \qquad (3)$$

where (d_i) are firm fixed-effects and the rest of the variables are defined as in (1) and (2) above. In (3), we would also expect β to be negative and significant.

In order to establish a causal link between competition and private benefits of control, we require a source of variation in $Comp_{sc}$ that (a) captures the intensity of competition and that (b) is plausibly exogenous to individual firms' decision-making. Since Demsetz (1973), it has been widely understood that "outcome" measures of competition, such as concentration indexes or market shares, are difficult to interpret as indicative of the highly competitive settings. As Demsetz argued:

> [In the] absence of effective barriers to entry, it would seem that the concentration of an industry's output in a few firms could only derive from their superiority in producing and marketing products or in the superiority of a structure of industry in which there are only a few firms. [5]

Demsetz's critique is that it is difficult to classify an industry as uncompetitive without referring to the specific barriers that prevent it from becoming competitive.[6]

To address Demsetz's critique we directly focus on those barriers that limit competitive forces. More specifically, we argue that government regulations affecting product and input markets provide a credible source of variation in competition that is likely to be exogenous for individual firms. As a result, in our empirical tests we investigate whether the reduction in government barriers to product and input market competition affect the level of PBC. Our main hypothesis is that if competition is important in limiting PBC, deregulation would lead to lower private benefits of control.

III. Measures of Private Benefits and Competition: Data Description and Preliminary Results

In this section, we briefly describe the measure of private benefits of control used in this paper, as well as the two variables used to capture the intensity of product and input competition. We also describe the data sources and provide summary statistics.

A. *Dual-Class Share Firms and Estimates of Private Benefits of Control (PBC)*

[5] Demsetz (1973), page 1.

[6] For example, Walmart and INTEL both enjoy large market shares of their respective industries. Their large market share, however, does not necessarily imply that the large department store or semiconductor industries are not competitive.

Following Zingales (1995) and Doidge (2004), we estimate private benefits of control using the voting premia between dual-class shares, adjusting for the relative voting power of securities:

$$PBC = \frac{P_H - P_L}{P_L - rv * P_H} \qquad (4)$$

Where P_H is the price of a high voting-right share, P_L is the price of a low voting-right share, and *rv* is the relative number of votes of the low voting-rights share compared to the high voting-rights securities. It is easy to see that when the low-voting securities are non-voting, *(4)* above is only the ratio of $P_H - P_L$ over P_L, the unadjusted voting premium.

Using the ratio of dual-class securities as a measure of private benefits has both advantages and disadvantages. The voting premium is appealing because it is based on security prices that reflect investors' valuations for being in control, which are related to PBC. It is a useful way to measure phenomena that are usually unobservable. Additionally, if both high- and low-voting securities are entitled to the same cash flow rights, estimates in this ratio will not be affected by changes in expected distributions: They will only capture the value of the differential voting rights. Lastly, we can estimate this ratio at different points in time, which allows us to use within-firm analysis. In terms of inference, fixed-effects models allow us to rule out the effect of time-invariant firm, industry and country characteristics on our estimates of private benefits of control.

A drawback of the dual-shares methodology to estimate PBC is that, in contrast with other measures of PBC based on acquisitions of controlling interests (Barclay and Holderness, 1989), it is only available only for firms that have self-selected into the pool of firms with two or more classes of shares, a decision that is likely to be correlated with high PBC to begin with. Furthermore, dual-class shares are prohibited in some countries (e.g., Japan), which prevents us from estimating PBC in those settings. An added shortcoming is that the ratio above required both classes of shares to be traded. These concerns may limit the relevance of our results to non-sample firms.

Perhaps more potentially challenging for our tests, the voting premia may vary over time, even when the true private benefits of control are constant. Time-varying voting premia can reflect that dual-class shares may, for example, not be comparable in terms of their cash-flow or other characteristics and these traits may evolve over time. To address such concerns, we limit our analysis to firms in which cash-flow distributions are linked across shares, and in our empirical specifications, we include controls for these variables. Alternatively, the estimated

voting ratio may vary over time as a function of changes in the probability of control contests (Zingales, 1995). As in earlier papers that have used this variable (e.g., Doidge, 2004), we have no information on the ownership structure of the firms in our sample. However, the fact that we are able to introduce firm fixed-effects allows us to control for the probability of having a pivotal vote, provided that this probability is constant over time. We argue that this is a reasonable assumption since ownership is relatively stable over time. In addition, to control for the possibility that the probability of a control contests varies over time, in some specifications we introduce time varying controls, such as the level of foreign direct investment and the value of the market capitalization of local firms, variables that are likely to be correlated with such events.

B. Measuring the Intensity of Competition: Regulation of Product and Input Markets

To capture the effect of competition on the voting premia, we use two measures that capture the degree to which government policies limit competition: the product market regulation (*PMR*) and the Regulatory Impact (*RI*) indexes (Conway, Janod and Nicoletti, 2005, and Conway and Nicoletti, 2006, respectively). These measures, developed by the OECD, were constructed to reflect the barriers to competition in settings where it is economically viable, and, thus, government regulation is likely to limit competitive forces.

The PMR index measures the level of countrywide product market regulations in the final-goods markets. This index, first introduced in 1998, summarizes information on 139 specific regulatory provisions related to state control of business activities, legal and administrative barriers to entrepreneurship, and barriers to international trade and investment (Conway, Janod and Nicoletti, 2005). The index is comparable across countries and has a scale of 0 to 6, where 0 (6) is the most (least) competitive. A distinguishing feature of the PMR index is that it is designed to capture objective information derived from underlying government policies. As such, changes in PMR reflect changes in barriers to product market competition, which is, arguably, the classic and fundamental parameter of competition. In contrast, indicators from, for example, the *World Competitiveness Forum*, the *Economic Freedom of the World*, and the "doing business" initiative of the *World Bank* rely on opinion surveys, which may be less objective both cross-sectionally and over time. Finally, an added advantage of the PMR index is that it is available for two years, 1998 and 2003, allowing us to measure the effect of within-country changes in competition on the level of private benefits of control.

As an alternative measure of competition, we use the *RI* index (Conway and Nicoletti, 2006). Like the PMR index, RI is an internationally comparable indicator that captures the importance of specific government policies for competition. The RI index has three novel

features. First, it focuses on anticompetitive regulations affecting the intensity of *input* competition. The index is constructed based on regulatory provisions affecting industries whose final output tends to be an intermediate input for other industries. These industries include financial services, energy, transport and communications, and retail distribution. Second, the index varies across industries and over time. Across-industry variation in RI results from the relative importance of its constituent industries for different final-goods industries. Financial services regulation, for example, would tend to limit competition, particularly in industries that rely on external sources of financing (Rajan and Zingales, 1998). To capture this general idea, the OECD computes industry-specific RI indexes using the input weights from input-output matrices from these intermediary industries. Over time, variation in RI reflects changes in regulations. Lastly, the RI index is also computed in the 0-6 scale and is available from the beginning of our sample. As a result, we can test for the effect of changes in input competition on the level of PBC using a longer time series.

While the RI index is appealing as a measure of competition, the connection between input market competition and private benefits of control may be more difficult to predict. Input deregulation can reduce input prices, increase profits and lead to potentially large PBC. Input competition may, in contrast, facilitate entry, increase the number of competitors and enhance the incentives to perform. The existing evidence, however, seems to support this latter argument. Certorelli (2004) and Certorelli and Strahan (2006) find that banking deregulation leads to increased entry and less concentration in final-goods markets. Bertrand, Schoar, and Thesmar (2007) show that bank deregulation in France led to more entry in bank-dependent industries. Beyond financing, Francois and Wooton (2008) show that competition in non-traded services has a significant effect on the performance of exporting firms that use services as inputs. Overall, input competition does seem to lead to higher levels of competition and efficiency.

In sum, the PMR and RI indexes provide a comprehensive view on the degree to which government policies affect the competitive environment that firms face. Unlike measures of industry concentration or markups, variation in PMR and RI reflects changes in government regulations at the country and industry levels, respectively. As such, they provide a rich and, arguably, exogenous source of variation that we use to test for the effect of competition on the level of private benefits of control.

Finally, and before describing the data, it is important to highlight that both PMR and RI are inverse measures of competition: The higher the index of anti-competitive regulations, the lower the intensity of competition. In the empirical tests, we use the negative PMR and RI such that higher levels of these variables can easily be interpreted as proxies for competition.

C. Data Sources and Sample Construction

To identify firms with dual-class shares that are less exposed to the concerns outlined in Part 2.A., we follow Doidge (2004) in including all DATASTREAM firms that meet the following criteria: (1) They have at least two types of shares with differential voting rights; (2) individual securities must be publicly traded and listed on a domestic exchange. The price of shares listed in different markets may vary as a function of local market conditions (Rosenthal and Young, 1990); (3) the low-voting class security is not convertible into the high-voting share; and (4) neither share receives a fixed dividend independent of the other class. We supplement these data with all firms in COMPUSTAT Global for which two or more publicly-traded securities were identified and whose shares met (2)-(4) above. Using this latter source allows us to expand our coverage of U.S. firms. In addition, we use *Mergent Online* and the Securities and Exchange Commission's *Edgar* resource to assess which firms meet the selection requirements described above.

Given that our objective is to estimate the voting premium between high- and low-voting shares, we obtain daily price information from DATASTREAM and COMPUSTAT Global. To be included in the sample, we require firms to have security price information for both shares for at least 15 days per year. In order to minimize the impact of outliers, we restrict our attention to securities with trading prices of at least one half of a unit of the local currency and we winsorize the data at the 1st and 99th percentiles of the distribution. We also require that the relative dividend distributions to high- and low-voting securities are within the 1st and 99th percentiles. Our measure of PBC is, then, the median voting premium for the year. After imposing all these sample restrictions, we arrive at 815 firms in 22 countries, 738 of which are also included in Doidge (2004). From these firms, we retain those with at least one matching competition measure. As a result, our final sample includes 586 firms in 16 countries.[7]

We obtain other security-level information, such as volume and dividends, from DATASTREAM and COMPUSTAT Global. Data on other firm characteristics, where available, are obtained from WORLDSCOPE and COMPUSTAT Global. We use WORLDSCOPE, MERGERNT *Online*, and web searches to obtain industry classifications under the Standard Industrial Classification (SIC) system. We use a wide range of country-level variables that vary over time, such as GDP growth, the ratio of the market capitalization of traded securities to GDP, the ratio of foreign direct investment (FDI) to GDP, and unemployment numbers, all from the

[7] The difference between 22 and 16 countries is explained by Brazil, Chile, Colombia, Peru, South Africa and Venezuela, all of which are not OECD members.

World Bank's *World Development Indicators*. Finally, we obtain several variables on the quality of the legal institutions from La Porta et al. (1998), such as the rule of law, accounting standards and anti-director rights indexes.

Due to firm-level and security price data availability, we start our analysis in 1990. Similarly, the regulatory index from the OECD is available until 2003. As a result, our analysis covers the 1990 to 2003 sample period.

D. Summary Statistics

Table I presents the summary statistics. As stated above, the sample contains 586 firms and 4,740 firm-year observations. The average firm, therefore, has 8.1 years of information. The main outcome variable is the voting premium as defined in equation (4). The voting premium is used in this paper as proxy for the private benefits of control that insiders enjoy, which presumably may be affected by the intensity of competition. The average estimated voting premium is 0.33, while the median is 0.068.

The voting premia numbers are based on firms with differential voting securities. The median high-voting security has one vote, and the median low-voting security is non-voting. On average, high-voting shares have 5.8 votes, with a minimum of one and a maximum of 500 votes per share. In contrast, the average number of votes per low-voting share is 0.21 votes, with a maximum of one vote per share.

Given that we are interested in the effect of competition on the voting premium, and as explained above, we define the variables "product" and "input" market competition indexes as the negative of the PMR and RI indexes, respectively. As a result, higher values of these product market competition indexes indicate higher levels of competition.

The average product market competition (PMC) index is -1.785. PMC is available for two years, 1998 and 2003, and for 935 firm-year observations. In 1998, the least competitive OECD country in the sample was Italy (-2.8), and the United Kingdom had the fewest barriers to competition in product markets (-1.1). In 2003, the country with the lowest PMC in the sample was Mexico (-2.2), and Australia and the United Kingdom had the most friendly environments for competition in product markets (-0.9).

The mean input competition, measured as the negative of the Regulatory Impact index, (-RI) is -0.181. The least competitive input markets are found in Italy in 1990 in the following industries: water and air transportation, with RI scores of -0.847. On the other extreme, 186 firm-year observations had RI scores of zero, which are indicative of no barriers to input competition.

Firms operating in such industries were located in countries as diverse as Canada, Finland, France, Germany, Italy, Sweden, Switzerland and the United Kingdom.

The average and median values of assets for the firms in the sample are $738 and $761 million U.S. dollars. The average market-to-book ratio is 1.33, and the mean net income to sales ratio is four percent. The ratio of the dividends paid to the low-voting security relative to those paid to higher voting shares is 1.756, and the median value is 1. As previously stated, we follow Doidge (2004) in requiring that dual shares do not receive independent dividend payments, but we do not require that dividends per share are equal across securities. In the results section, we show that limiting the analysis to firms with equal dividends significantly reduces the sample size but does not affect the results of the paper.

Given our interest in investigating the determinants of the voting premia within countries, we also report in Table I variables that reflect changes in local business conditions, the value of domestic traded firms and foreign investment. We report the rate of growth in the gross domestic product (GDP), with a mean rate of 1.9 percent. The ratio of the value of the market capitalization to GDP, which in the sample has an average value of 68.6 percent. The ratio of foreign direct investments (net inflows) relative to the value of GDP has a mean value of 2.5 percent. Finally, the rate of unemployment was 7.7 percent during the sample period. A concern with including these variables as controls, however, is that they are endogenous. As such, they may bias the estimated effect of competition on the voting premium, complicating inference. Despite these concerns, we include them as controls in some specifications.

A potential drawback of requiring matching dual-class and competition information is that the firms in the sample may not be representative of the average of dual-class share firms. In Table II, we list the number of observations per country (Column I) and report the mean voting premium by country from the sample firms (Column II). As a benchmark for comparison, we also present the mean voting premium for firms that meet all the screening tests other than having matching competition information from the OECD (Column IV). The correlation between the voting premia numbers reported in Columns (II) and (IV) reported in the last row of Table II is extremely high (0.92). Similarly, the correlation between the numbers in Column II and the voting premia numbers reported by Doidge (2004) (Column V) is also very high (0.71).

Table II, Columns VI and VII, introduce the country-level average product market and input competition variables. As measured by product market (input) competition, Italy (Norway) is the least competitive country and the United Kingdom (Australia) is the most competitive country. The last row in Table II reports the correlation between these indexes of competition and the estimated voting premia for sample firms. Interestingly, the correlation between product

market competition and the voting premia is a -0.48, and the correlation between voting premia and input market competition is -0.50, both relatively high. These numbers suggest that there is a strong negative relationship between the level of product and input competition and the level of private benefits of control.

Table II, Columns VIII, IX and X, report the value of three country-level variables that have been widely used in the literature—the anti-directors, accounting standards and rule-of-law indexes (La Porta et al., 1998)—and their correlation with the mean voting premium at the country level. The anti-directors and the rule-of-law indexes show a large negative correlation with the voting premia (-0.311 and -0.397, respectively), while the accounting standards variable seems largely uncorrelated with the estimate of private benefits of control provided in Column II.

Overall, Table II highlights a strong negative correlation between measures of competition and the voting premia. However, it also shows that other cross-country variables may exhibit similar correlations. To alleviate inference problems, in the next sections we examine the effect of stiffer competition on the level and dispersion of the voting premia, controlling for time-invariant country characteristics.

IV. The Effect of Competition on the Level and Dispersion of PBC

A. Competition and the Level of Private Benefits of Control

As a benchmark for the effect of competition on private benefits of control, we start our analysis by reporting differences-in-means tests for firms in the most and least competitive environments. To facilitate inference, we collapse voting premia and competition variables at the firm level and report only one observation per firm. There are 561 firms with matching product market competition information and 400 firms with input competition data.

Table III splits sample firms into two groups as a function of the intensity of competition. In the table, we define as "highly" ("less") competitive (Columns II and III, respectively) firms those that do business in markets that, relative to the sample, are less (more) heavily regulated. The first (second) row in Table III classifies firms based on the intensity of product market (input) competition.

Using product market competition, Column II shows that the mean voting premia in competitive environments is 0.138. In contrast, the average voting premia in less competitive

settings is 0.627. The difference of 0.49 is statistically significant at the five-percent level.[8] The Mann-Whitney test of equality of distributions yields a value of 8.36, indicating that the distributions of the two samples differ at conventional levels. In economic terms, moving from a non-competitive to a highly competitive setting implies a reduction of 77 percent in the estimated level of PBC.

The second row in Table III uses input competition to construct the subset of highly and less competitive groupings. Consistent with the idea that input competition limits the level of PBC, the voting premium is 0.40 in less competitive settings and only 0.19 in competitive settings; the 0.21 difference is significant at the five-percent level. The Mann-Whitney z-statistic is 5.186, rejecting the notion that the two samples are comparable. In economic terms, the difference of means across groups is also substantial. Highly competitive firms exhibit a voting premium that is 52-percent lower relative to the less competitive group.

While differences of means are intuitive, the reported disparity in the level of private benefits may potentially reflect the influence of important omitted firm, industry or country characteristics. As stated in Section II, a widespread criticism of using cross-country variation only resides in the fact that countries differ in many dimensions, which complicates inference. A crucial advantage of our tests below is that we can overcome such criticism in at least three ways. First, by introducing country-fixed effects, we ensure that our results are not driven by time-invariant country characteristics, such as the country's legal origin. Second, controlling for firm-fixed effects ensures that our results are not driven by firm unobserved heterogeneity. Third, by focusing on an arguably exogenous source of variation in the intensity of product and input competition, we provide a tighter link between competition and the voting premium.

In Table IV, Column I, we report the effect of product market competition on the voting premium, without any controls. Given that the PMC index varies at the country level, we report clustered standard errors at the country level. The results in Column I show that increasing competition leads to lower levels of PBC. A one-standard deviation reduction in policies that inhibit competition leads to a decline of 0.28 in the voting premia. The effect is significant at the ten-percent level. Interestingly, the R-squared of this model is 0.109.

In Table IV, Columns II to Column IV, we first address whether time-invariant cross-country characteristics may be capturing the effect of competition on the voting premium. Specifically, we introduce country-fixed effects and an array of industry, country and firm controls. Column II reports that the effect of product market competition on PBC is economically

[8] Standard errors are clustered at the country level (product market competition) and industry-country level (input competition).

and statistically large. Moving from Italy's to France's PMC index in 2003—a 0.2 change in PMC—would lead to a reduction of 0.25 in the voting premia, significant at the one-percent level.

To test whether certain industry characteristics may be capturing the reported effect of competition on the voting premium, in Table IV, Column III, we also include two-digit industry-fixed effects. The effect of product market competition continues to be large and significant. In Column IV, we introduce a large range of country controls, including the rate of growth in the country, the level of market capitalization of local markets, the inflows of foreign direct investment and the unemployment rate, as well as firm-level controls, including the natural logarithm of the firms' assets, the market-to-book ratio, the ratio of net income to sales, the relative dividends paid to different securities and the relative volume traded. As mentioned earlier, the regression that includes this array of endogenous controls is provided as a robustness test. The estimated coefficients are, however, difficult to interpret econometrically because these "control" variables are arguably endogenous to competition itself and, therefore, should not be used as exogenous controls. The specification that does not include these controls is the reduced form effect of competition on PBC, which provides the coefficient of interest. In what follows, we show the robustness of the main coefficient when including these variables as controls. Yet, we do not emphasize those results.

In Table IV, Columns V to VIII, we examine the effect of input competition on the voting premium. The input competition index (- RI) captures the effect of anti-competitive regulations on input markets and, as such, is a test for a different, more indirect channel for the effect of competition on the voting premium. Column V shows the effect of input competition without controls. The estimated coefficient is -0.89, which is economically large and significant at the one-percent level. The point estimate suggests that a one-standard deviation movement in this index (0.145) is associated to a decline in the voting premium of 0.13. Column VI shows that introducing country and year effects diminishes the magnitude and statistical significance of the input competition effect. The estimated coefficient is -0.56, now significant at the ten-percent level. In Columns, VII and VIII, we introduce industry controls and industry, country and firm controls, respectively. The results indicate that, relative to the effect of product market competition, the link between input competition and the voting premium is less robust.

Overall, Tables III and IV provide evidence that competition and, in particular, product market competition can lead to significantly lower levels of PBC. We show that the results are not driven by time-invariant country characteristics. This finding is important given the pre-existing evidence for the relevance of country characteristics to corporate governance outcomes (La Porta et al. (1998); Doidge, Karolyi, and Stulz, 2004, among many others). However, it does

not help us determine whether competition leads to lower PBC due to a reduction in the voting premia of incumbent firms or due to selection effects, an issue that is addressed in Section C.

We turn to testing for the effect of competition on the dispersion of PBC.

B. Competition and Dispersion in Private Benefits of Control

The summary statistics reported in Tables I and II document a significant dispersion in the voting premia for firms in the sample. Such dispersion is, by itself, not surprising. Doidge et al., (2007), for example, document a substantial dispersion in governance outcomes and emphasize the crucial role of country characteristics in explaining it. In this section, we investigate whether competition limits the dispersion of private benefits of control. We proceed in two steps. First, we use quantile regressions to investigate if the within-country dispersion in PBC is, relative to the observed cross-country dispersion, significant. Second, we extend our quantile analysis to test whether competition plays a determining role in limiting the within-country dispersion in the voting premia.

In Table V, Panel A, we report the conditional 90^{th}, 75^{th}, 50^{th}, 25^{th}, and 10^{th} quantiles of the voting premia distribution, when we condition only on year dummies. As expected, we document a large dispersion in PBC in the sample. Table V, Panel A, reports that the 90^{th} and 75^{th} percentiles of PBC are 1.15 and 0.58, respectively, significant at the one-percent level. On the other extreme of the PBC distribution, the 25^{th} and 10^{th} percentiles are 0.03 and -0.08, respectively, also significant at conventional levels. The resulting differences between the 90^{th} and the 25^{th} and 10^{th} percentiles are 1.12 and 1.23, respectively, confirming the large dispersion in PBC previously reported both in the literature and in this paper.

To investigate the importance of within-country dispersion in PBC, we include country dummies in the quantile regressions analysis. The results are reported in Table V, Panel B. The 90^{th} and 75^{th} percentiles of PBC are now 0.69 and 0.45, respectively, both significant at the one-percent level. These numbers suggest that, at the top quantiles, the within-country PBC distribution is relatively less dispersed than the comparable between-country dispersion. The 25^{th} and 10^{th} percentiles are 0.07 and 0.06, respectively. Perhaps more interestingly, the differences between the 90^{th} and the 25^{th} and 10^{th} percentiles are 0.61 and 0.63, providing strong evidence that there is a large dispersion in the voting premia within countries.

Table V highlights an important result: There is a substantial degree of dispersion in PBC that cannot be explained by time-invariant country characteristics. Therefore, we turn to examine whether the dispersion in PBC can be linked to the intensity of competition. To test for this effect,

we use quantile regressions to evaluate whether the effect of competition is similar for upper and lower quantiles of the PBC distribution. As argued in Section II, if product and input competition limits the dispersion in PBC, we would expect these indexes to have a larger (lower) effect for the upper (lower) quantiles of the voting premia.

Table VI examines the effect of our proxy for product market competition on the dispersion of the voting premia. In Panel A, we report quantile regressions that include year and country dummies and the product market competition index. Notice that the inclusion of country dummies in quantile regressions effectively nets out the effect that country characteristics have on the dispersion of PBC. To facilitate the comparison across specifications, we estimate simultaneous-quantile regressions and report bootstrapped standard errors. The conditional effects of PMC on the voting premia are -1.996 and -1.242 at the 90^{th} and 75^{th} quantiles, respectively, (both are significant at the one-percent level). In contrast, the conditional effects of product competition on the 25^{th} and 10^{th} quantile are -0.464 and -0.235, respectively. Furthermore, all but the 10^{th} quantile point estimates are significant at the five-percent level.

These estimates show that competition can limit the dispersion in the voting premium. A one-standard deviation increase in product market competition would lead to a 0.92 reduction in the difference between the 90^{th} and 10^{th} percentiles of the PBC distribution. A similar increase would lead to a reduction in the difference between the 75^{th} and 25^{th} quantiles of 0.24. Increases in competition can, therefore, lead to a substantially lower dispersion in PBC.

In Table VI, Panel B, we examine the robustness of these results to the introduction of industry dummies. The inclusion of industry dummies allows us to control for the time-invariant industry variation in PBC and to focus on the within-industry and country variation in private benefits. The resulting estimated coefficients are -1.69, -1.23, -0.69, -0.62 and -0.30 at the 90^{th}, 75^{th}, 50^{th}, 25^{th} and 10^{th} quantiles, respectively. These results confirm the idea that stiffer competition leads to an economically large and statistically significant reduction in the voting premia. A one-standard deviation increase in the product market competition index induces a 0.72 reduction in the difference between the 90^{th} and 10^{th} percentiles of the PBC distribution.

In Table VII we turn to test for the impact of input competition at different quantiles of the PBC distribution. Panel A shows a large effect of -1.14 in the 90^{th} quantile and -0.37, -0.10, -0.06 and -0.04 at the remaining quantiles; all but the last quantile are significant at conventional levels. Industry controls highlight the importance of the top quantiles to understand the link between competition and the voting premia. Specifically, the conditional effect of input competition is concentrated in the top quantiles. The estimated coefficients at the 90^{th} and 75^{th} quantiles are -1.44 and -0.94, respectively. The effect of input competition is indistinguishable

from zero at the 50th quantile and below. The estimated coefficients reported in Table VII replicate the pattern of economically and statistically large effects of competition on the upper quantiles of the PBC distribution, and the less significant effects in the bottom quantiles. These results are consistent with the idea that competition limits the dispersion in the voting premium.

The analysis presented thus far has shown the conditional effect of competition at selected quantiles of the PBC distribution. A natural extension is, therefore, to examine the effect of output and input competition on the entire distribution of the voting premia. Figures 1 and 2 present such results when we use, respectively, product market and input competition. Each point in the solid line represents the estimated effect of competition on the voting premia at each percentile of the PBC distribution, conditional on year, country and industry dummies. To facilitate inference, these figures also report the five-percent confidence intervals obtained using bootstrapped standard errors.

Figure 1 shows that the effect of product market competition is not statistically different from zero for the lowest quantiles of the PBC distribution. But competition has a large and significant effect on PBC for the 20th and higher quantile. As reported before, the larger effects of competition are concentrated in the top quantiles of the PBC distribution.

Figure 2 reports the effect of input competition on the PBC distribution. The graphical analysis shows that for the bottom half of the PBC distribution, the conditional effect of input competition is indistinguishable from zero. In other words, input competition does not seem to significantly affect the voting premia for moderate levels of the PBC distribution. Input competition, however, has a large and significant effect on PBC for the top quantiles.

More generally, the graphical representation of Figures 1 and 2 highlight in a straightforward way the importance of quantile regressions. These figures show that competition does not equally affect the voting premia at every point of its distribution. The larger competitive effects at the top quantiles and the lower estimated coefficients for the lower end of the PBC distribution imply that competition leads to a reduction in the dispersion of private benefits. Quantile regressions allow us to unveil such insights, which would be potentially ignored had we examined only the average effects of competition on the voting premia.

Beyond the effect on dispersion, Figures 1 and 2 provide an interesting insight into the relative effect of product and input market competition on PBC. Figure 1 documents a nearly across-the-board effect of product market competition in limiting the level of PBC. Figure 2, in contrast, shows that input market competition may not be effective at curbing low levels of private benefits. Such results are consistent with the idea that input markets may bind as disciplinary devices only when the level of managerial waste becomes sufficiently large.

Overall, this section has documented a large dispersion in the voting premia that cannot be explained by time-invariant country characteristics. We have provided consistent and robust evidence that increases in product and input competition lead to significant reductions in the dispersion of voting premia. We have shown that while product and input markets affect the voting premium in different ways, they both limit the dispersion in private benefits of control. More broadly, our analysis provides compelling support for Stigler's convergence in performance hypothesis.

In the following section, we use the panel dimension of our data to provide sharper tests for the effect of competition on the level of private benefits of control.

C. Unleashing Competition: Does Competition Lead to Lower PBC?

The results, so far, have demonstrated that competition is a key determinant in shaping the level and dispersion of private benefits of control, within both countries and industries. While such results are new in the literature, they do not provide causal evidence that changes in competition do, indeed, discipline managers. As previously noted, competition can induce existing firms to become more efficient, but competition may also affect the selection of surviving firms. As a consequence, the level and dispersion of private benefits thus far reported may by be alternatively explained by changes in the composition of firms or by the disciplinary role of competition on incumbent firms.

To test for the direct disciplinary effect of competition on the voting premium, we introduce firm-fixed effects, which allow us to assess whether stiffer competition lead to changes in the level of PBC, holding firm-permanent characteristics constant. Using firm-fixed effects improves inference since it controls for any omitted variable that is constant within firms over time. However, it does not fully solve the biases that can be created by the potential endogeneity of the competition variable. As described in Section II, a crucial advantage of the measures of competition used in this paper is that they are based on changes in government regulations, which provide a plausibly exogenous source of variation in the intensity of competition. As a result, we can directly test whether government deregulation of product and input markets affects the level of PBC as measured by the voting premium.

In Table VIII, we present the effect of product market competition on the voting premium, allowing for firm-fixed effects in our regressions. Column I shows that higher levels of product competition lead to lower estimates of the private benefits of control. The results indicate that countries that deregulated product markets between 1998 and 2003 experienced, on average,

a decline in the voting premium of their local firms. Moving from Italy's PMC index to France's in 2003—a 0.2 change in PMC—would lead to a reduction of 0.30 in the voting premium, significant at the one-percent level. In other words, the quality of corporate governance can be directly and drastically affected by deregulation of product markets.

Table VIII, Column III, introduces an array of firm-level controls that capture firm, size, profitability, investment opportunities, relative dividend payments and volume. The estimated effect of product market competition on the voting premium is largely unchanged in both economic and statistical terms. The estimated coefficient is -1.5, significant at the one-percent level. Such specification is presented as a robustness test, even when the introduction of endogenous firm-level controls may lead to biased and inconsistent least-squares estimates.

If product market competition were to affect the level of private benefit consumption, we would expect that the more homogeneous the product markets, the larger the effect of competition on the voting premium would be. We investigate this effect by splitting the activities of sample firms into manufacturing and non-manufacturing. The results for the manufacturing subsample are presented in Table VIII, Column II. The point estimate is -1.85, significant at the one-percent level. In Column IV, we include the same firm-level controls as those in Column II, and the reported effect of competition on the voting premium is unaffected.

In Table VIII, Column V, we investigate whether country-level variables that change over time have a bearing on the relationship between product market deregulation and the voting premium. Deregulation in product markets, as measured by our key variable of interest, is determined at the country level. As such, it may capture the variation in other contemporaneous country-level variables that affect the voting premium. For example, if changes in the domestic value of investment opportunities affect the voting premium, we would expect that the country-level variables, such as the rate of GDP growth, unemployment, the local market capitalization or foreign direct investment inflows, may instead explain the effect of competition on the measure of PBC. The results indicate that even after controlling for this array of controls, the impact of PMC on PBC is economically and statistically significant. Specifically, a one-standard deviation decline in product regulation would lead to a 0.32 reduction in the voting premium. The effect is significant at the one-percent level. Finally, Column VI shows the results for a subsample of firms where actual dividend payouts are equal for both high- and low-voting securities, confirming that the effect of PMC on the voting premium is not driven by different dividend distributions for high- and low-voting rights shares.

Table IX explores the effect of input competition on PBC. Column I shows that once we control for time-invariant firm characteristics, the effect of input competition on PBC, while

negative, is not statistically different from zero. The standard errors in such a specification are large, confirming that there is significantly more noise in the link between input competition and the voting premia than between product competition and our key variable of interest. Column II examines the effect of input competition in manufacturing firms. Consistent with Table VIII, we find a significant effect of competition in limiting PBC in manufacturing activities. In this case, however, both the estimated coefficients and the standard errors are relatively large.

A concern with the estimated coefficients reported in Columns I and II of Table IX is that the effect of input competition on PBC is difficult to establish because this index varies little from year to year. In contrast to the product competition index, which captures a five-year variation between 1998 and 2003, the input index captures year-to-year changes in competition. To investigate this concern, in Table IX, Columns III to VII, we test for relatively "large" changes in the input competition index. More specifically, we test whether sufficiently large increases (at least two percent) and decreases (at least five percent) in the input regulations lead to changes in PBC. Column III (IV) shows the effects for the full sample (manufacturing only). Column III reports that when input market regulation increases, PBC increases by 0.09. The effect of declining input regulations on PBC is, however, insignificant. Column IV confirms that the effect of input competition is more pronounced in manufacturing activities. Interestingly, it reports significant symmetric effects both for large increases and for decreases in input competition. Significant reductions in the level of input competition lead to increases of 0.12 in the reported PBC, significant at the five-percent level. Similarly, large changes in the input competition index lead to a 0.06 decline in PBC, also significant at the five-percent level. Despite the previously discussed caveats about the rationale for including endogenous controls, in Columns V and VI we show the impact of input competition on manufacturing firms when we use the full set of firm- (Column V) and firm and country-level (Column VI) controls. The results confirm the generally negative and marginally significant effect of input competition on PBC. Finally, in Column VII we report the estimated coefficients for the subsample of firms with common dividend payments. Such subsample, reports that input competition leads to a reduction on the voting premia that is significant at the one-percent level.

We also tested for the effect of product and input competition indexes on firms' exit decisions. These untabulated results do not show significant effects of changes in regulation on firm survival rates. One caveat in interpreting such findings, however, is that firms in our sample are relatively large publicly-traded firms. Large firms may exit the market only slowly over time and not immediately after deregulation takes place.

Taken together, Tables VIII and IX demonstrate that competition leads to significantly lower estimates of private benefits of control. Both product and input market competition affect PBC. The effect of product market competition is large and robust across specifications and subsamples, indicating that the pressure from product markets is crucial for private benefits. The impact of input market competition, in contrast, is predominantly important for relatively large changes in RI and for firms in manufacturing settings. If we follow the pre-existing literature in interpreting the voting premia as a measure of inefficiency inside the firm, our results indicate that product and input market competition do, indeed, discipline insiders.

Further Tests

Finally, in Table X, we further test for this disciplinary channel of competition by interacting product and input competition indexes with a proxy for the degree of a firm's efficiency. Specifically, we assume that profitable firms in the first year they appear in the sample are arguably better run than those that are less profitable. As a result, we expect less (more) profitable firms to be more (less) vulnerable to competition. In Table X, Columns I to III, we show the interaction between a dummy variable equal to one if the firm is above the 25^{th} percentile of the net income-to-sales distribution and the product and input competition indexes. We find that the voting premium is more responsive to product market competition in firms that are least profitable to begin with (Column I). The interactions with the input competition index in Columns II and III are not robustly statistically different from zero, but the sign of the coefficients follows that of the results from the product market analysis. The results from Column I provide empirical support for the idea that product competition disciplines insiders by increasing their probability of default.

An alternative route to test for the disciplining effect of competition is to investigate the interaction between competition measures and the quality of the domestic legal environment. Building on the work of La Porta et al. (1998), several studies have documented that countries with stronger rule-of-law environments tend to display lower private benefits of control (Nenova, 2003; Dyck and Zingales, 2004; and Doidge, 2004). As such, the marginal effect of competition is expected to be larger in settings where the law does a relatively poorer job of disciplining the firms' insiders.

To test for this idea, we interact our two indexes of competition with an indicator variable equal to one whenever the country has a higher than median rule-of-law index, and zero otherwise. The results are presented in Table X, Columns IV and V. For both measures, we find

that the effect of competition is predominantly larger in countries with relatively weaker rule-of-law environments.

These findings are consistent with the earlier reported result that competitive pressures have a larger effect on the voting premia at higher levels of the private benefits of control distribution. Furthermore, the results are potentially informative for policy debates. While the legal tradition that a given country has followed is extremely difficult and costly to change, deregulation of product and input markets is potentially easier and cheaper to implement. In sum, competition is a powerful and potentially cost-effective tool to discipline insiders of publicly-traded corporations.

V. Conclusions

A central tenet in financial economics is that competition improves resource allocation and performance. While this view dates back to Adam Smith (1776), there has been little systematic evidence for the link between changing competition and the quality of governance institutions inside firms.

In this paper, we examine the impact of competition on the level and the dispersion of private benefits of control enjoyed by the firm's controlling shareholders. We estimate private benefits of control using the voting premium between shares with differential voting rights. To capture the intensity of competition, we use two indexes of objective anti-competitive regulations directed at limiting product and input market competition in 16 countries. These indexes vary over time, allowing us to examine the within-country relationship between competition and the voting premia. Furthermore, their time-series variation is arguably exogenous to individual firms' decision-making, facilitating inference.

We find that the intensity of product market competition significantly and consistently affects the estimates for the value of being in control. Our results indicate that stiffer product competition limits the scope of managerial waste and sharpens insiders' incentives to perform. These competitive effects are particularly large for poorly run firms and in countries with weak legal environments.

Our results also show that competitive forces lead to a significant reduction in the dispersion in private benefit consumption within industries and countries: Both product and input competition play a determining role in limiting the dispersion in the voting premia. Surprisingly, the impact of competition on the dispersion of governance outcomes has, thus far, been ignored in the governance literature.

Overall, our results demonstrate that competition policy can have a crucial influence on corporate governance. Furthermore, we think that the direct link between the intensity of product market competition and measures of the quality of corporate governance, financial development and economic growth is a fruitful research agenda.

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FIGURE 1: EFFECT OF PRODUCT MARKET COMPETITION ON THE VOTING PREMIUM

This figure shows the conditional effect of product market competition as measured by the negative of the product market regulation index (PMR) on the voting premium, the estimate of private benefits of control (PBC) used in this paper, at each point of the PBC distribution. The X-axis shows the quantile of the PBC distribution. The Y-axis shows the magnitude of the conditional effect of product market competition, controlling for country, industry and year dummies. In the graph, the middle solid line plots the estimated conditional effect of product market competition on the voting premium at each percentile of the voting premium distribution. The shaded line represents the 95-percent confidence interval using bootstrapped standard errors.

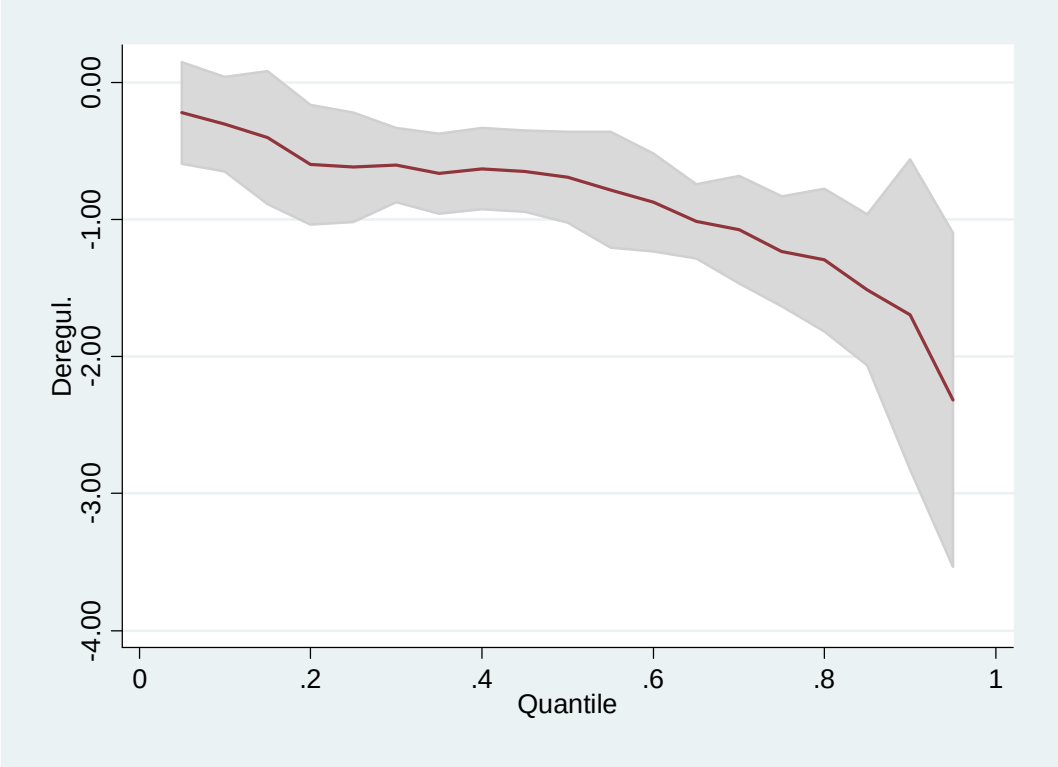

FIGURE 2. EFFECT OF INPUT COMPETITION (- RI) ON THE VOTING PREMIUM

This figure shows the conditional effect of input competition as measured by the negative of the regulatory impact index (RI) on the voting premium, the estimate of private benefits of control (PBC) used in this paper, at each point of the PBC distribution. The X-axis shows the quantile of the PBC distribution. The Y-axis shows the magnitude of the conditional effect of input competition, controlling for country, industry and year dummies. In the graph, the middle solid line plots the estimated conditional effect of input competition on the voting premium at each percentile of the voting premium distribution. The shaded line represents the 95-percent confidence interval using bootstrapped standard errors.

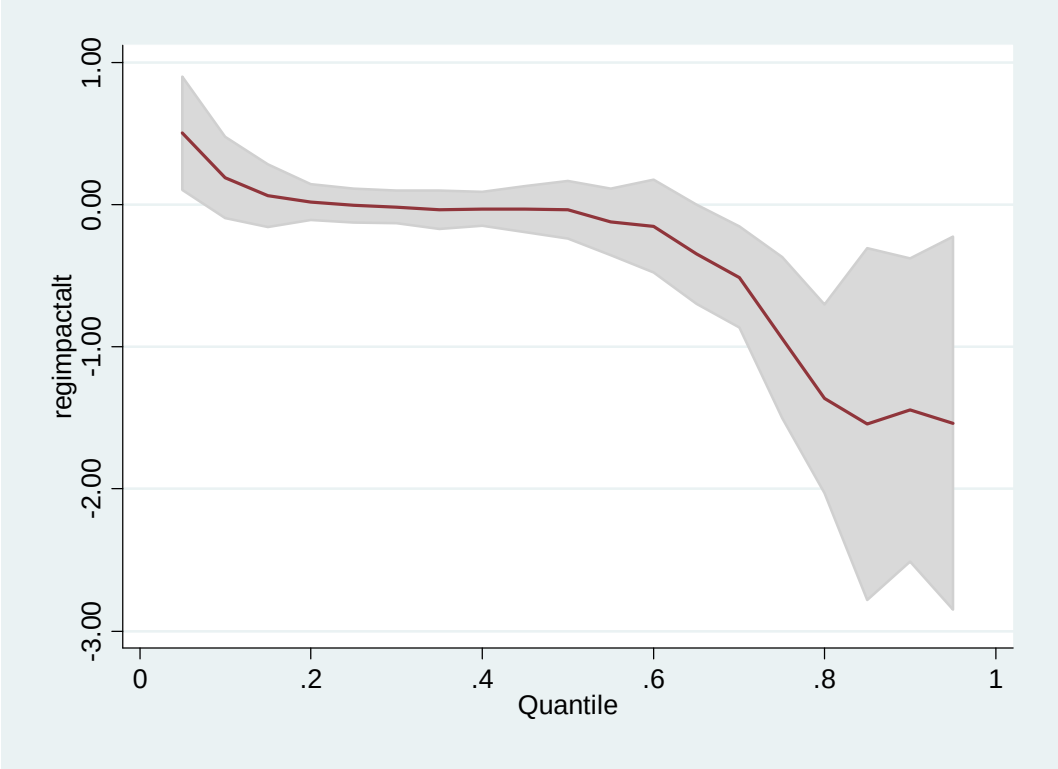

TABLE I. SUMMARY STATISTICS

This table presents summary statistics for firms with dual-class shares with differential voting rights and matching competition information from the OECD for at least one year between 1990 and 2003. The voting premium is defined as $(P_H - P_L)/(P_L - rv * P_H)$, where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. Product market regulation (PMR) is an OECD index (scale: 0 to 6) of the degree to which government policies restrict competition in product markets at the country level, available for 1998 and 2003. Regulatory impact (RI) is an OECD index that measures the degree of government regulation (scale: 0 to 6) affecting input markets. RI varies by industry and country and is available until 2003. Product and input market competition indexes are the negative of PMR and RI, respectively: Higher values indicate higher levels of competition. Votes per shares, high and low, are the per-share votes of the higher and lower rights shares, respectively. *Ln* assets is the natural logarithm of assets in U.S. dollars. Market-to-book ratio is the market value of equity plus the total value of assets minus the book value of equity divided by the value of assets. Net income/sales is the ratio of net income relative to the value of sales. Relative dividends is the ratio of the annual per-share dividend payments for the low-voting share to the annual per-share dividend payments to the high-voting security. GDP growth is the rate of growth in the gross domestic product, in dollars. Market capitalization to GDP is the ratio of the total market value of listed companies to GDP. FDI inflow to GDP is the ratio of foreign direct investments (net inflows) relative to the value of GDP. Unemployment rate is the fraction of the labor force that is unemployed.

Variable	Number Firm-Years	Mean	Median	Standard Deviation
Voting premium (ratio)	4,740	0.328	0.068	0.843
Votes per share, high voting share	4,740	5.805	1.000	29.629
Votes per share, low voting share	4,740	0.207	0.000	0.386
Product market competition index *(-) Product market regulation (PMR) index*	958	-1.785	-1.700	0.524
Input competition index *(-) regulatory impact (RI) index*	4,470	-0.181	-0.123	0.145
Ln assets (in millions, US dollars)	3,765	6.605	6.635	2.014
Market to book (ratio)	3,744	1.329	1.096	0.915
Net income / sales (ratio)	3,664	0.040	0.031	0.141
Relative dividends (ratio)	3,190	1.756	1.000	19.044
GDP growth (in percent)	4,740	0.019	0.021	0.023
Market capitalization to GDP (ratio)	4,740	0.686	0.532	0.519
FDI inflow to GDP (ratio)	4,528	0.025	0.014	0.037
Unemployment rate (rate)	4,984	0.077	0.079	0.028

TABLE II. COUNTRY-LEVEL SUMMARY STATISTICS

Column I contains the total number of firm-year observations with dual-class shares and matching competition information. Column II presents country-level mean voting premium (VP) as defined in equation 4 in the text. Column III shows the standard deviation of VP. Column IV shows the VP for all dual-class firms, including those for which competition information was not available. Column V reports the average VP by country estimated by Doidge (2004). Column VI and VII show the mean values of the indexes of product and input market competition, respectively. (-) Product Market Regulation (PMR) is the negative of the index of product market barriers from the OECD. (-) Regulatory Impact (RI) is the negative of the index of restrictions in four strategic industries whose main output is an intermediate input for other industries, also from the OECD. We use the (-) PMR and (-RI) so that higher values indicate more competition. Columns VIII, IX and X report the country-level indexes of anti-directors rights, accounting standards and rule-of-law enforcement, all from La Porta, et al. (1998). The correlation coefficient between the average voting premia for firms in the sample and the average country-level variables is reported in the last row.

						Measures of Competition				
Country	**Number of Observations in Sample**	**Estimated Voting Premium**	**Standard Deviation**	**Estimated Voting Premium**	**Voting Premium Doidge (2004)**	**(-) Product Market Regulation**	**(-) Regulatory Impact**	**Anti-Director**	**Acct. Stds**	**Rule of Law**
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)	(IX)	(X)
Australia	15	0.062	0.314	0.190	0.155	-1.129	-0.088	4	75	10.00
Austria	130	0.376	0.637	0.372	0.366	-1.675	-0.246	2	54	10.00
Brazil	.	.	.	0.329	0.253	.	.	3	54	6.32
Canada	424	0.089	0.227	0.103	0.119	-1.303	-0.176	5	74	10.00
Chile	.	.	.	0.084	0.085	.	.	5	52	7.02
Colombia	.	.	.	0.498	0.295	.	.	3	50	2.08
Denmark	326	0.145	0.605	0.174	0.088	-1.340	-0.182	2	62	10.00
Finland	232	0.495	1.213	0.495	0.072	-1.669	-0.201	3	77	10.00
France	73	0.500	0.320	0.500	0.404	-2.100	-0.203	3	69	8.98
Germany	747	0.193	0.429	0.194	0.155	-1.672	-0.150	1	62	9.23
Italy	801	0.565	0.887	0.565	0.491	-2.401	-0.257	1	62	8.33
Korea	245	0.963	1.178	0.539	0.67	-2.047	.	2	62	5.35
Mexico	26	0.202	0.751	0.227	0.008	-2.315	.	1	60	5.35
Norway	150	0.400	1.245	0.337	0.042	-1.673	-0.280	4	74	10.00
Portugal	38	0.045	0.516	0.045	0.065	-2.017	-0.144	3	36	8.68
South Africa	.	.	,	0.021	0.076	.	.	5	70	4.42
Sweden	622	0.088	0.365	0.085	0.045	-1.529	-0.137	3	83	10.00
Switzerland	198	0.725	1.848	0.697	0.162	-2.100	-0.130	2	68	10.00
United Kingdom	302	0.437	1.121	0.437	0.157	-1.021	-0.176	5	78	8.57
United States	411	0.090	0.262	0.085	.	-1.300	-0.105	5	71	10.00
Venezuela	.	.	.	0.210	0.134	.	.	1	40	6.37
Correlation with Column (II)				0.919	0.707	**-0.480**	**-0.496**	**-0.311**	**0.039**	**-0.397**

TABLE III. INTENSITY OF PRODUCT AND INPUT MARKET COMPETITION AND THE VOTING PREMIA: DIFFERENCES OF MEANS

This table shows the mean voting premia for firms with matching competition information. The voting premium is defined as $(P_H - P_L)/(P_L - rv * P_H)$, where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. The first row reports data for firms with matching product market regulation (PMR) information from the OECD. The second row reports data for firms with matching regulatory impact (RI) information from the OECD. PMR and RI capture the level of anti-competitive regulations affecting, respectively, product and input markets. PMR captures regulations at the country level, while RI denotes country-industry-level restrictions. Column I shows mean voting premia for all firms. Columns II and III divide firms into two groups: "*highly*" and "*less*" competitive, respectively. A firm is classified as being in a highly competitive environment if the firm is subject to below-median levels of anti-competitive regulation. The firm is classified as "less competitive" if regulatory restrictions are above the sample median. Standard errors are reported in parentheses. Standard errors are clustered at the country (PMR) and country-industry (RI) level. The number of firms used to compute the average is reported in squared brackets. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

Measures of Competition	All Firms	Highly Competitive	Less Competitive	Difference (II)-(III)	Mann Whitney |z|
	(I)	(II)	(III)	(IV)	(V)
Product market competition	0.384 **	0.138 ***	0.627 ***	-0.489 **	8.355 ***
	(0.149)	*(0.033)*	*(0.185)*	*(0.184)*	
	[561]	[279]	[282]		
Input market competition	0.296 ***	0.191 ***	0.401 ***	-0.210 **	5.186 ***
	(0.045)	*(0.051)*	*(0.068)*	*(0.085)*	
	[400]	[200]	[200]		

TABLE IV. BEYOND CROSS-COUNTRY REGRESSIONS: THE EFFECT OF THE INTENSITY OF PRODUCT AND INPUT MARKET COMPETITION ON THE VOTING PREMIUM

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - P_L)/(P_L - rv * P_H)$, where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. Product and input market competition indexes are the negative of the PMR and RI anti-competition regulation indexes, respectively: Higher values indicate higher levels of competition. Product market regulation (PMR) is an OECD index that captures the degree to which government policies restrict competition in product markets at the country level. Regulatory impact (RI) is an OECD index that measures the degree of government regulation affecting input markets. RI varies by industry and country. Columns (I) and (V) report the pooled impact of the relevant competition measure on the voting premium. Columns (II) and (VI) include year controls and country-fixed effects. Columns (III) and (VII) include year controls, country dummies and industry (two-digit ISIC)-fixed effects. Columns (IV) and (VIII) include the same controls as in Columns (III) and (VII) plus the following yearly firm and country controls: *ln* firm assets, market-to-book ratio, net income to sales, the relative liquidity (relative ratio of shares traded) and dividends of the high- and low-voting shares, GDP growth, the market capitalization of the domestic stock exchanges to GDP ratio, the ratio of foreign direct investment to GDP, and the unemployment rate. Standard errors are clustered at the country (Columns I to IV) and country-industry (Columns V to VIII) level. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium							
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
Product market competition index	-0.549 *	-1.299 ***	-1.306 ***	-0.549 *				
(- PMR)	*(0.307)*	*(0.424)*	*(0.434)*	*(0.294)*				
Input competition index					-0.889 ***	-0.564 *	0.157	-0.527
(- RI)					*(0.316)*	*(0.336)*	*(0.647)*	*(0.329)*
Year controls		Yes	Yes	Yes		Yes	Yes	Yes
Country fixed-effects		Yes	Yes	Yes		Yes	Yes	Yes
Industry fixed-effects			Yes	Yes			Yes	Yes
Firm and country level controls				Yes				Yes
Observations	935	935	933	933	4,419	4,419	4,419	4,363
R-squared	0.109	0.105	0.158	0.272	0.024	0.021	0.057	0.034

TABLE V. THE DISPERSION OF THE VOTING PREMIA WITHIN COUNTRIES

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - P_L)/(P_L - rv * P_H)$, where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. All coefficients are obtained using quantile regressions estimated at different quantiles ($90^{th,}$ 75^{th}, 50^{th}, 25^{th} and 10^{th} percentiles, respectively) of the voting premium distribution. Panel A shows the dispersion in the voting premia without additional controls. Panel B presents the dispersion in voting premia after controlling for country-fixed effects. Bootstrapped standard errors are in parentheses. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium				
	(I)	(II)	(III)	(IV)	(V)
	90th Conditional Percentile	**75th Conditional Percentile**	**50th Conditional Percentile**	**25th Conditional Percentile**	**10th Conditional Percentile**
Panel A:					
	1.150 ***	0.579 ***	0.211 ***	0.0272 **	-0.0782 **
	(0.120)	*(0.0854)*	*(0.0277)*	*(0.0131)*	*(0.0369)*
Year controls	Yes	Yes	Yes	Yes	Yes
Observations	4,740	4,740	4,740	4,740	4,740
Panel B:					
	0.687 ***	0.450 ***	0.169 ***	0.0718	0.0598
	(0.250)	*(0.149)*	*(0.0526)*	*(0.215)*	*(0.437)*
Year controls	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes
Observations	4,740	4,740	4,740	4,740	4,740

TABLE VI. PRODUCT MARKET COMPETITION AND THE DISPERSION OF THE VOTING PREMIA

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - P_L)/(P_L - rv * P_H)$, where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. All coefficients are obtained using quantile regressions estimated at different quantiles ($90^{th,}$ 75^{th}, 50^{th}, 25^{th} and 10^{th} percentiles, respectively) of the voting premium distribution. Both panels show the conditional effect of product market competition on the voting premium at each quantile. The product market competition index is defined as the negative of the PMR regulation index: Higher values indicate higher levels of competition. Product market regulation (PMR) is an OECD index that captures the degree to which government policies restrict competition in product markets at the country level. Panel A includes country dummies, and Panel B includes country and industry (two-digit ISIC) dummies. Bootstrapped standard errors are in parentheses. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium				
	(I)	(II)	(III)	(IV)	(V)
	Percentile				
	90 th	75 th	50 th	25 th	10 th
Panel A:					
Product market competition index (- PMR)	-1.996 *** *(0.478)*	-1.242 *** *(0.156)*	-0.705 *** *(0.116)*	-0.464 ** *(0.202)*	-0.235 *(0.259)*
Year controls	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes
Observations	935	935	935	935	935
Panel B:					
Product market competition index (- PMR)	-1.693 *** *(0.459)*	-1.231 *** *(0.224)*	-0.691 *** *(0.148)*	-0.618 *** *(0.189)*	-0.303 * *(0.179)*
Year controls	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
Observations	933	933	933	933	933

TABLE VII. INPUT MARKET COMPETITION AND THE DISPERSION OF THE VOTING PREMIA

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - P_L)/(P_L - rv * P_H)$, where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. All coefficients are obtained using quantile regressions estimated at different quantiles ($90^{th,}$ 75^{th}, 50^{th}, 25^{th} and 10^{th} percentiles, respectively) of the voting premium distribution. Both panels show the conditional effect of input competition on the voting premium at each quantile. Input market competition is defined as the negative of Regulatory Impact (RI) index. As such, higher values indicate higher levels of competition. Regulatory Impact (RI) is an OECD index that measures the degree of government regulation affecting input markets. RI varies by industry and country. Panel A includes country dummies, and Panel B includes country and industry (two-digit ISIC) dummies. Bootstrapped standard errors are in parentheses. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium				
	(I)	(II)	(III)	(IV)	(V)
	Percentile				
	90 th	75 th	50 th	25 th	10 th
Panel A:					
Input competition index	-1.135 ***	-0.369 ***	-0.101 ***	-0.062 ***	-0.036
(- RI)	*(0.181)*	*(0.0686)*	*(0.0242)*	*(0.0112)*	*(0.0224)*
Year controls	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes
Observations	4,419	4,419	4,419	4,419	4,419
Panel B:					
Input competition index	-1.443 **	-0.938 ***	-0.0377	-0.007	0.190
(- RI)	*(0.573)*	*(0.358)*	*(0.135)*	(0.0396)	*(0.167)*
Year controls	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes
Observations	4,419	4,419	4,419	4,419	4,419

TABLE VIII. PRODUCT MARKET COMPETITION AND THE VOTING PREMIUM: WITHIN FIRM ANALYSIS

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - P_L)/(P_L - rv * P_H)$, where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. The product market competition index is defined as the negative of the PMR regulation index: Higher values indicate higher levels of competition. Product market regulation (PMR) is an OECD index that captures the degree to which government policies restrict competition in product markets at the country level. All specifications include firm- and year-fixed effects. Columns (I), (II) and (V) report within-firm estimates for all firms in the sample. Columns (III) and (IV) show within-firm estimates only for manufacturing firms. Column (VI) reports estimated coefficients for firms for which both dual-class shares were reported as having equal dividends. Columns (II) and (IV) to (VI) include the following firm-level yearly controls: *ln* firm assets, market-to-book ratio, net income to sales, the relative liquidity (relative ratio of shares traded) and dividends of the high- and low-voting shares. Columns (V) and (VI) also include the following country-level controls: GDP growth, the market capitalization of the domestic stock exchanges to GDP ratio, the ratio of foreign direct investment to GDP, and the unemployment rate. Standard errors are clustered at the country level. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium					
	(I)	(II)	(III)	(IV)	(V)	(VI)
Product market competition index	-1.521 ***	-1.451 ***	-1.851 ***	-1.720 **	-0.610 ***	-0.405 ***
(- PMR)	*(0.492)*	*(0.459)*	*(0.577)*	*(0.594)*	*(0.205)*	*(0.091)*
Sample:	All	All	Manuf	Manuf	All	All Same divs.
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls		Yes		Yes	Yes	Yes
Country controls					Yes	Yes
Observations	935	935	490	490	935	229
R-squared	0.345	0.413	0.455	0.485	0.516	0.552

TABLE IX. INPUT COMPETITION AND THE VOTING PREMIUM: WITHIN FIRM ANALYSIS

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - P_L)/(P_L - rv * P_H)$ where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. The input competition index is defined as the negative of the RI regulation index: Higher values indicate higher levels of competition. Regulatory impact (RI) is an OECD index that measures the degree of government regulation affecting input markets. RI varies by industry and country. All specifications include firm- and year-fixed effects. Columns (I), (III), (V) and (VI) report within-firm estimates for all firms in the sample. Columns (II) and (IV) show within-firm estimates only for manufacturing firms. Column (VII) reports estimated coefficients for firms for which both dual-class shares were reported as having identical dividends irrespective of industry. Columns (III) to (VII) include the following firm-level yearly controls: *ln* firm assets, market-to-book ratio, net income to sales, the relative liquidity (relative ratio of shares traded) and dividends of the high and low voting shares. Columns (VI) and (VII) also include the following country-level controls: GDP growth, the market capitalization of the domestic stock exchanges to GDP ratio, the ratio of foreign direct investment to GDP, and the unemployment rate. Standard errors are clustered at the country and industry level. ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium						
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Input competition index	-0.211	-8.515 *			-8.383 *	-6.704	-6.461 ***
(- RI)	*(0.836)*	*(5.002)*			*(4.991)*	*(4.590)*	*(2.147)*
Input competition index increase 5 %			-0.00385	-0.0602 **			
(RI falls more than 5%)			*(0.0332)*	*(0.0274)*			
Input competition index declines 2 %			0.0944 **	0.123 **			
(RI increases more than 2%)			*(0.0459)*	*(0.0513)*			
Sample:	All	Manuf	All	Manuf	Manuf	Manuf	Manuf Same divs
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls					Yes	Yes	
Country controls						Yes	
Observations	4,419	2,355	3,857	2,049	2,355	2,355	1,452
R-squared	0.027	0.044	0.025	0.026	0.047	0.067	0.036

TABLE X. PRODUCT AND INPUT MARKET COMPETITION AND THE VOTING PREMIA: INTERACTIONS

The dependent variable is the voting premium between shares of differential voting rights. The voting premium is defined as $(P_H - P_L)/(P_L - rv * P_H)$ where P_H and P_L are, respectively, the price of the higher and lower voting power securities and rv is the ratio of votes per share for the high- and low-voting securities. Product and input market competition indexes are the negative of the PMR and RI anti-competitive regulation indexes, respectively: Higher values indicate higher levels of competition. Product market regulation (PMR) is an OECD index that captures the degree to which government policies restrict competition in product markets at the country level. Regulatory impact (RI) is an OECD index that measures the degree of government regulation affecting input markets. RI varies by industry and country. All specifications include firm- and year-fixed effects. High profitability is an indicator variable equal to one if the firm's net income to sales in the first year the firm appears in the sample is above the 25th percentile of such profitability variable for the entire sample. High rule of law is a dummy equal to one if the firm is in a country with above-median rule of law (La Porta et al (1998)). Standard errors are clustered at the country level (Columns (I) and (IV)) and country and industry level (Columns (II), (III) and (V). ***, ** and * denote significance at the 1, 5, and 10 percent levels, respectively.

	Dependent variable: voting premium				
	(I)	(II)	(III)	(IV)	(V)
Product market competition index	-1.751 ***			-1.184 ***	
(- PMR)	*(0.512)*			*(0.287)*	
Input competition index		-0.825	-11.348 **		-1.491 *
(- RI)		*(1.000)*	*(5.493)*		*(0.859)*
High profitability * product market competition index	0.278 **				
	(0.117)				
High profitability * input competition index		0.025	3.979		
		(1.058)	*(2.981)*		
High rule of law * product market competition index				0.960 ***	
				(0.301)	
High rule of law * input competition index					2.550 **
					(1.160)
Sample:	All	All	Manuf	All	All
Year controls	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	843	3,891	2,150	935	4,419
R-squared	0.347	0.042	0.066	0.396	0.032