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The Impact of Product Market Competition on Private Benefits of Control [*]

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- Abstract -

This paper investigates the impact of product market competition (PMC) on private benefits of control (PBC). We estimate PBC using the voting premium between shares with differential voting rights. We use two measures of the intensity of product market competition: an *external* competition measure based on industry-level import penetration, and an *internal* measure derived from domestic product market regulations. Using data for publicly-traded firms in 19 countries for which information on dual class shares is available we find that PMC is strongly negatively correlated with PBC. The evidence indicates that the effect is particularly strong for firms in industries that are likely to be concentrated and in countries with poor legal environments. We further examine the channels through which PMC enhances governance. We find evidence indicating that improvements in the availability of industry information and the higher default probability associated with tougher competition are two important forces in reducing the estimated price gap between dual class shares. Using exchange rates and terms of trade as instruments for import penetration, we find that the link between competition in product markets and private benefits of control is not spurious. Overall, our results suggest that product market competition can help in curbing private benefits of control.

JEL classification: G30, G15, D40

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"Monopoly is a great enemy to good management"

Adam Smith (1776)

I. Introduction

A widespread view among most economists is that product market competition improves corporate governance. Yet, this disciplining force is often overlooked in the corporate governance literature.[1] A common argument in support of the idea that product market competition improves corporate governance is natural selection, as competition would drive out of the market persistently inefficient firms (Alchian (1950), Stigler (1958)). This threat, according to Shleifer and Vishny (1997), is "probably the most powerful force towards economic efficiency in the world." In contrast, the absence of competition implies weaker incentives, greater diversion of productive resources, and lower overall efficiency. As argued by Leibenstein (1966), these efficiency losses might be the *real* costs of monopolies.

While this argument is appealing, it may be too simplistic as it does not really flesh out why agency costs are lower in competitive environments. In principle, the owners of monopoly firms have the same incentives to monitor and discipline insiders as shareholders in more competitive environments (Jensen and Meckling (1976)). Thus, if ownership and control are separated and monitoring is identical in all firms, then all competitors incur equal agency costs. It follows that increasing the number of market participants should have no effect on the amount of resources that are diverted by insiders.

Beyond the fear of failure associated to competition, the literature has identified another crucial difference between competitive and monopolistic industries, namely, the amount and quality of available information about the environment in which insiders operate. Improved information can potentially reduce agency costs by lowering monitoring costs and by allowing for

[1] See the excellent surveys by Shleifer and Vishny (1997), and Becht, Bolton and Roell (2003). Two notable exceptions are Nickell (1996) and Dyck and Zingales (2004).

sharper relative performance evaluation (Holmstrom (1982), Nalebuff and Stiglitz (1983), Hart (1983)).[2]

The objective of this paper is to shed light into two questions. First, is there evidence that justifies the perception that product market competition can improve governance? Second, if product market competition affects governance, what are the channels through which competition operates? In particular, we are interested in investigating if increasing the number of competitors affects the quality of the available information for investors, or if, alternatively, it is the increased risk of failure that leads to lower waste by insiders.

In this paper we measure governance using an estimate of private benefits of control (PBC), a commonly used measure of the quality of governance arrangements (Lease, McConnell and Mikkelson (1983), DeAngelo and DeAngelo (1985), Rydqvist (1987), Baclay and Holderness (1989), Zingales (1994, 1995), Nenova (2003), Dyck and Zingales (2004), Doidge (2004)). We estimate PBC using the voting premium between shares with differential voting rights.[3] The logic for using this approach is that if control is valuable beyond cash flows that are shared with minority investors, and if control is a function of the stipulated voting rights, then the premium between differential voting shares could be used to estimate PBC (Zingales (1995)).[4]

The private benefits of control that we have in mind relate to the ability of insiders to redirect firms' resources to themselves through transfer pricing or outright theft (Jensen and Meckling (1976)), or the ease with which controlling shareholders can use information about valuable investment projects to pursue them outside the firm (Dyck and Zingales (2004)).

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[2] The theoretical foundation for the link between PMC and governance is not easy to formalize (Scharfstein (1998), Holmstrom and Tirole (1989)).

[3] Lease, McConnell and Mikkelson (1983), DeAngelo and DeAngelo (1985), Rydqvist (1987), Zingales (1994, 1995), Nenova (2003), and Doidge (2004).

[4] 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. We think that this assumption is reasonable since ownership rarely changes over time and because corporate control contests outside the US are infrequent.

While PBC could also represent "amenity" or "psychic" values (Demsetz and Lehn (1985), Harris and Raviv (1988), Aghion and Bolton (1992)), we think that the large estimated differences in PBC across countries (Nenova (2003), Dyck and Zingales (2004), Doidge (2004)) are hard to rationalize by these arguments alone. Furthermore, PBC are correlated with weak investor protection regimes (La Porta *et al.* (1997), Nenova (2003), Doidge (2004)), concentrated ownership and underdeveloped capital markets (Dyck and Zingales (2004)).

We use a panel of 554 listed firms in 19 countries to test for the impact of product market competition on PBC using two measures of competition: an *external* metric based on industry-level import penetration[5], and an *internal* index that is derived from country-level product market regulations (*PMR*).[6]

Using these measures we initially assess the impact of product market competition relative to other determinants of PBC that have been previously identified in the literature, most of which are cross-country characteristics. We find that product market competition is strongly negatively correlated with the voting premium, our measure of PBC. An increase in import penetration by 5 percentage points relative to the industry average is correlated with a decline in the voting premium of 3.5 percentage points, or 10 percent of the mean voting premium. Similarly, reducing product market regulations by 0.2 percentage points –equivalent to moving from the levels of *PMR* in France to those in Italy–, would reduce PBC by 0.13 percentage points.

[5] Import penetration is defined as the ratio of industry imports to production plus imports at the industry level using data from the Organization for Economic Cooperation and Development (OECD) and the United Nations Industrial Development Organization (UNIDO) for all available countries and industries in the 1990 to 2002 period.

[6] The measure for domestic competition is the *Product Market Regulation* (PMR) index from the OECD, which measures the degree to which governments promote or inhibit competition at the country-level (Conway, Janod and Nicoletti (2005)). The PMR index is only available for OECD countries for the years 1998 and 2003.

We also find that the estimated PBC are lower for firms in countries with higher rule of law indices, but that the negative correlation between import penetration 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 (Nenova (2003), Dyck and Zingales (2004), and Doidge (2004)), yet the fact that conditional on a weak legal environment, PMC is strongly correlated with lower PBC suggests that competition in the product market can potentially reduce insiders' consumption of private benefits.

To push the analysis further, instead on relying on cross country differences in PBC we exploit the panel dimension of our data. Using within firm variation, we find that competition is consistently negatively correlated with our measure of PBC, even after controlling for time-invariant characteristics.

Having shown that product market competition does indeed reduce the estimated private benefits of control, we use our panel setting to further investigate the specific channels that have been previously suggested in the literature as conducive to improved corporate governance as a function of PMC. In particular, we test for potential improvements in the quality of information with competition, and for improved incentives to perform as the probability of being driven out of the market goes up.

To test for the information channel we create an industry homogeneity index as in Parrino (1997) that captures the average correlation of equity returns for firms within industries. We use this index as a proxy for the informational advantage of increasing the number of competitors from the perspective of non-controlling shareholders, and test if the impact of product market competition differs as a function of the homogeneity of industries. To test for the threat of business failure, we investigate the impact of product market competition for firms of different levels of profitability. We anticipate that the lower the initial profitability of a firm, the higher the subsequent impact of PMC on PBC.

Our results indicate that changes in product market competition, as measured by import penetration only affect the estimated private benefits of control for firms that operate in homogenous industries. In other words, import penetration does not affect the voting premium in industries with greater intra-industry heterogeneity.

The evidence also suggests a large negative correlation between changes in import penetration and changes in PMC for less profitable firms, which is consistent with the idea that product market competition might induce complacent insiders to improve their performance.

Additionally, we find that the impact of PMC on the voting premium tends to be economically and statistically more significant in highly concentrated industries and less important for non-manufacturing firms, which tend to be less prone to foreign competition. Firm size, asset intensity, market to book ratios and leverage do not seem to affect our results.

Finally, to address potential endogeneity concerns, we follow Revenga (1992) and Bertrand (2004) and instrument for import penetration using exchange rates and terms of trade, both of which are naturally correlated with import penetration but uncorrelated with the error in the measure of private benefits of control. Using instrumental variables, we confirm that PBC are negatively correlated with import penetration.

The rest of the paper is organized as follows. Section II describes the data on dual-class share firms and the measures of product market competition used in this paper. Section III, explains our empirical strategy for testing both the potential impact of product market competition on PBC and for assessing specific channels through which competition might affect governance outcomes. Section IV presents the results and discusses the interpretations of our findings, and Section V concludes.

II. Data

II. A. Dual share firms and estimate of private benefits of control (PBC)

The information for firms with dual shares used in this paper comes from two sources. We start with all firms reported by Doidge (2004) to have dual-class shares in Datastream during 1994 and 2001. To be included in the sample, Doidge (2004) requires that: (1) firms have at least two types of shares with differential voting rights, (2) that both share classes are publicly traded and listed on the domestic exchange, (3) the low voting class is not convertible to the high class and that (4) neither share receives a fixed dividend independent of the other class. Doidge (2004) also provides detailed information on the voting rights for each class of shares.

We then supplement these data with all firms in *Compustat Global* for which two or more publicly-traded securities were identified. *Compustat Global* provides both a firm and a security code, which eases the detection of firms with at least two securities. *Compustat Global* allows us to increase the number of firms with dual class shares and in particular it allows us to identify a number of firms from the United States, which by construction were not collected by Doidge (2004). To make both samples consistent in terms of the requirements described in the paragraph above, we performed web searches and consulted *Mergent Online*. For U.S. firms we also used information from the Securities and Exchange Commission *Edgar* online dataset.

Given that our objective is to estimate the voting premium between high and low-voting shares based on security prices, we obtain daily closing price information from Datastream. To be included in the sample we require firms to have security price information for both shares for at least 40 days per year. In order to minimize the impact of outliers, we restrict our attention to securities with trading prices of at least one unit of the local currency and we winsorize the data at the 1 and 99 percentiles of the distribution. After imposing all these sample restrictions we have 749 firms in 23 countries, 694 of which are from Doidge (2004).

Following Zingales (1995) and Doidge (2004) we compute the voting premium as the ratio of the price of a voting right to the price of a cash-flow right as follows:

$$PBC = \frac{P_H - P_L}{P_L - rv * P_H} \qquad (1)$$

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 share. In Table II, Column II we report the country averages for (1). Given that the bulk of the firms in this sample are from Doidge (2004), we also report in Column III the mean PBC as reported in Table 2 of that paper. Not surprisingly, the correlation between the two estimates of PBC is very high (0.82).

II. B. Measures of Product Market Competition

Given that our objective is to analyze the impact of product market competition on the voting premium, we identify two measures that can potentially capture its intensity: the level of import penetration and the index of product market regulation from the OECD. Import penetration is defined as:

$$IP_{sct} = \frac{\text{Im}\, ports_{sct}}{\text{Im}\, ports_{sct} + \text{Pr}\, oduction_{sct}} \qquad (2)$$

Where IP_{sct} is the import penetration ratio for industry *s* in country *c* at time *t*. Given that import penetration is at least partially determined by industry characteristics, we also compute industry adjusted import penetration (*IAIP*) ratios using the average import penetration for a given industry for all countries and years with import and production data.

We construct IP_{sct} and $IAIP_{sct}$ using imports and production information from two sources: (1) the Structural Analysis Database (STAN) from the OECD, which is available through Source OECD online, and (2) the Industrial Demand-Supply Balance Database, from UNIDO,

which is available on CD-ROM. The OECD reports imports and production data by country and industry (ISIC Rev. 3) for selected countries starting in 1970, and its coverage is improved starting 1980 or later if a given country joined the organization thereafter. The most current data is for 2002. For non-OECD countries we use information from UNIDO (ISIC Rev. 3), which reports production and imports information for selected manufacturing industries and countries in the 1990 to 2002 period.

In order to match industry data to firms' information, we used *Worldscope*, *Mergent Online* and web searches to obtain the relevant industry codes. *Worldscope* and *Mergent Online* provide industry classifications under the Standard Industrial Classification (SIC) classification system. We convert import penetration ratios to three-digit SIC codes using concordance tables for all available countries and industries in the 1990 to 2002 period.

The measure for domestic competition used in this paper is the product market regulation (*PMR*) index from the OECD (Conway, Janod and Nicoletti (2005)). The PMR index is an internationally comparable measure of the degree to which policies promote or inhibit competition in areas of the product market. The index is calculated using formal regulations relating to the extent of state control of business activities, legal and administrative barriers to entrepreneurship and barriers to international trade and investment. In 1998 (2003), the index ranged from a high 3.91 (2.76) in Poland to a low of 1.15 (0.92) for the United Kingdom.

In order to relate our results to previous work in the financial development literature, we obtain a wide range of controls that seek to capture the role of local institutions and other country characteristics. These include, rule of law, accounting standards and anti-director rights from La Porta *et al*. (1998), as well as measures of tax compliance, newspaper circulation and quality of competition from Dyck and Zingales (2004).[7] Finally, we use information from the *World*

[7] We have also assessed the impact of other country level variables such as French legal origin, religion, crime levels, cheating on taxes (La Porta *et al* (1998), Dyck and Zingales (2004)), and takeover regulations and charter provisions (Nenova (2003)). In all specifications these alternative controls do not affect our

Development Indicators dataset at the World Bank on indices of real effective exchange rates and terms of trade.[8]

Given that *Datastream* does not provide comprehensive coverage in terms of firm level income statement and balance sheet data, we use *Worldscope* and obtain information on sales, net income, assets, number of employees, total liabilities and market value. For US firms we use financial information data from *Compustat Global*.

II. C. Summary Statistics

Using information for firms for which the voting premium and at least one measure of product market competition is available, we arrive at 554 firms in 19 countries. The country-level summary statistics are presented in Table II, Columns IV to VIII. Relative to the total number of firms identified with dual class shares as reported in Column I, once we merge industry information, the sample is reduced. The most salient difference is Brazil, for which there is import penetration information for only 11 firms, relative to the 167 firms for which the voting premium can be estimated. Brazil accounts for 80 percent of the reduction in firms from Columns I to IV.

The estimates of PBC are relatively consistent as we move from the entire set of firms to those with some information about the intensity of competition in product markets. The correlation of country-level averages of PBC between the two samples is 0.80. Two exceptions are Brazil, for which the estimated PBC goes from 16 percent in Column II to negative 3.6 in Column V and Switzerland for which it changes from 0.46 to 1.2.

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results on product market competition, and these controls tend to be obscured by the measures discussed in the text.

[8] The real effective exchange rate index is defined as the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs. The index of terms of trade is calculated using the ratio of export to import prices in a given country and year.

The low estimate of PBC for Brazil in our sample can be potentially attributed to the hypothesis anticipated in this paper, namely, that product market competition limits PBC, as the low level of PBC is matched with extremely large import penetration ratios.

Overall, average import penetration by country reflects substantial competition from external markets. In the entire sample, average import penetration is 20 percent; and using equally weighted country averages it is equal to 24 percent, which ranges from the high 68 percent in Brazil to slightly less than 13 percent in Portugal and Norway. Note that these ratios are unlikely to be representative of the effective average import penetration in these countries as the information provided herein comes from industries for which firms with dual shares were identified, which are unlikely to occur randomly across industries. The correlation between country averages in *IP* and PBC is equivalent to -0.32.

Column VII presents industry adjusted import penetrations (*IAIP*) which are arguably more informative about how intensive import competition is in a given local market. Interestingly, firms with dual-class shares are found in local industries that are, on average, less prone to competition from imports. The average sample *IAIP* is -0.06. Looking at specific countries, *IAIP* is particularly low for dual-class share firms in the United States (-0.14), Italy (-0.14) and Korea (-0.13) and high for firms in Denmark (0.03), Austria (0.06) and Brazil (0.53). Also noteworthy, the correlation between *IAIP* and PBC is negative and large -0.42.

Column VIII presents the OECD index of product market regulation (*PMR*) using country averages for the two years (1998 and 2003) for which this measure is available. The average *PMR* is 1.8 for all countries, ranging from a low 1.01 and 1.13 in the United Kingdom and Australia, respectively, to a high 3.1 for Turkey, 2.4 for Italy and 2.3 for Mexico. The correlation between country levels of *PMR* and measures of PBC is positive and large, and it is equal to 0.57.

As a preliminary assessment of whether our measures of the strength of product market competition can potentially add to our understanding of the determinants of PBC, we report the International Country Risk Agency' rule of law index in Column IX. This index has been widely used in the financial development literature (La Porta *et al.* (1998)) and has been found to negatively correlate with PBC (Dyck and Zingales (2004)). As expected, rule of law is negatively correlated with PBC (the correlation is -0.05), yet this correlation is significantly low relative to those found between PBC and *IAIP* and *PMR*, respectively.

III. Empirical strategy

III. A. Does product market competition (PMC) affect private benefits of control (PBC)?

When trying to test for the impact of PMC on PBC, we need to overcome two major obstacles. First, finding reasonable measures for both PMC and PBC and second, finding a source of variation that allows us to identify if PMC directly affects PBC or if the estimated correlations, when present, are spurious.

As discussed in the previous sections, we estimate PBC using the voting premium as it was defined in equation (1), and product market competition using two metrics: (a) the industry adjusted import penetration (*IAIP*) by country, industry and year, and (b) the OECD product market regulation (*PMR*) index (Conway, Janod and Nicoletti (2005)).

Using the voting premium to measure PBC comes with both advantages and disadvantages. It is appealing because it is based on security prices that reflect investors' valuations for being in control, which are related to PBC. It is, therefore, a useful way in which phenomena that are usually private can be measured meaningfully. The voting premium approach is also attractive because changes in this variable do not reflect variations in firms' cash flows as dual-class shares in this sample receive similar dividends. Third, it allows for the estimation of PBC for a given firm at different periods of time, allowing for panel data analysis.

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)), the measure of PBC is only available for those firms that have self-selected into the pool of firms with at least two classes of shares, a decision that is likely to be correlated with high PBC to begin with. Second, dual-class shares are not allowed in every country (ex. Japan), preventing us from estimating PBC in those settings. Third, it requires making some assumptions about the probability that a control contest occur in order to correctly estimate PBC (Zingales (1995)).

In the absence of information on firms' ownership structures and given our inability to control for the associated probabilities that firms might be taken over, in this paper we primarily rely on within firm variation in the voting premium. As such, we implicitly assume that the probability of having a pivotal vote is constant, which we think is a reasonable assumption since ownership rarely changes over time and because takeovers outside the US are infrequent.

Measuring the degree of product market competition is also challenging.

Industry adjusted import penetration by country, industry and year is an attractive measure of competition because it overcomes a common drawback of other proxies that solely vary across countries or industries. There are numerous institutional differences across countries that are difficult to adequately control for, leading to estimated coefficients that potentially reflect the effect of unobserved variables. It is, however, a market concentration index, and as such, it might not necessarily reflect lack of competition: industry concentration can arise even in competitive environments (Demsetz (1973)). To overcome these concerns, we focus on within *IAIP* variation and we revisit our results using instrumental variables.

The OECD product market regulation index is appealing as a measure of PMC because it is not based on competitive outcomes, but rather it is constructed based on government regulations that are unlikely to reflect specific firm conditions. Its main disadvantage is that it

only varies by country and that it is only available for 1998 and 2003, which significantly limits our ability to use the indicators of *PMR* in the panel setting.

With our measures of *IAIP* and *PMR* in hand, the source of variation in the regression framework we specify are changes over time in the degree of competition within an industry in a given country (*IAIP*) or within a country (*PMR*). Our aim is to test how private benefits of control change as our measures of competition increase.

In order to facilitate the comparability of our work to previous studies that have analyzed the determinants of PBC in similar settings (Nenova (2003), Dyck and Zingales (2004) and Doidge (2004)), our initial specification analyzes the impact of increased product market competition in a specification where we can revisit the institutional determinants of PBC that do not vary within countries. Therefore, the basic specification we estimate is as follows:

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

where PBC_{ist} are private benefits of control for firm *i,* in industry *s,* at time *t* and $Comp_{st}$ is the relevant measure of competition (results are shown with $Comp_{st}$ measured as *IAIP* and using the *PMR* index). X'_{ist} is a vector of firm specific controls and W'_c a vector of the country characteristics studied in the literature. Since these controls vary only across countries it is not straightforward to interpret the coefficients as causal, because the potential for omitted variables is considerable. Time (d_t) and industry (d_s) dummies are included to control for aggregate time trends and industry specific invariant characteristics, respectively. If product market competition reduces PBC, we anticipate β to be negative and significant when we use industry-adjusted import penetration, and positive and significant when we use the *PMR* index.

In order to address the limitations of relying only on cross-sectional variation, we then proceed to estimate our parameter of interest β using changes in competition at the industry and country level. For this purpose we estimate the following specification with firm fixed effects:

$$PBC_{ist} = \alpha + \beta Comp_{st} + X'_{ist}\vartheta + d_i + d_t + \varepsilon_{ijt} \qquad (4)$$

In this setting, the time-invariant country and industry variables drop out and the variation identifying the β coefficient comes from changes over time in the degree of competition faced by a firm in its own industry. The fixed effects specification accounts for unobserved heterogeneity at the firm level: any time-invariant characteristic (country, industry or firm specific) that is correlated with our measures of competition, would have biased the estimated coefficients in the cross sectional specification.

It is worth noting that $Comp_{st}$ is measured both with *IAIP* and the OECD *PMR* index. When using import penetration as a proxy for competition, interpreting our estimated β as a causal parameter is not straightforward, as *IAIP* is itself an outcome measure of market conditions that is not necessarily exogenous in this setting. In contrast, using changes in PBC based on changes in the OECD *PMR* index arguably reflects exogenous changes to PBC as *PMR* is determined by country-wide changes in government policies that affect product market competition and that are not specific to a given firm or industry.

III. B. How does product market competition (PMC) affect PBC?

Even if we establish a link between PMC and PBC (β), we then face the challenge of explaining the specific channels through which it occurs. As mentioned in the introduction, the literature has identified two important channels through which PMC can affect insiders' behavior. The first channel stresses the increased information associated with competition, which can lower monitoring costs and allow for improved relative performance evaluation (Holmstrom (1982), Nalebuff and Stiglitz (1983), Hart (1983)). The second channel is related to the higher default

probability associated with stiffer competition, which increases the costs of managerial waste (Alchian (1950), Stigler (1958), Schmidt (1997)).

Industry Homogeneity

To measure the extent to which product market competition can convey relevant information to market participants, we follow Parrino (1997) in estimating an index of industry "homogeneity" based on the within industry correlation (at two digit SIC code-level) of stock returns with respect to an equally-weighted industry return index during the 1980 to 2003 period.[9] As in Parrino (1997) we proceed as follows. (1) An equally-weighted (EW) return index is estimated for each industry using all firms with monthly returns on CRSP, (2) firms returns are regressed against the EW market return index and the industry return index, and (3) the partial correlation coefficient for the industry return index in this regression is averaged across all firms in each industry to obtain the homogeneity index.[10]

In using this index, we are implicitly assuming that within industry correlations found in the Unites States are representative of the real correlations that one would observe elsewhere. In other words, we are assuming that these correlations are driven by industry specific characteristics, an approach that resembles the empirical strategy of Rajan and Zingales (1998).

The homogeneity index reflects the extent to which within industry equity prices fluctuate simultaneously and consequently it captures the degree to which shocks to an industry affect all firms at the same time. Therefore, we would expect that for highly homogenous industries, it is easier for shareholders to extract information from the interactions in the market place. These informed interactions can help outside investors learn about the true environment in

[9] We estimate our own homogeneity index, as the index in Parrino (1997) does not report information for a significant number of firms in our sample.

[10] As in Parrino (1997) we restrict the number of firms that are used in the estimation to be in the 35 to 50 range since the partial correlation coefficient from the two-factor model is negatively related to the number of firms used in the industry index

which firms operate, and then potentially allow them to act on this information to discipline insiders. This threat could potentially limit the diversion of resources by controlling shareholders.

Industry Concentration

We also use a measure of industry concentration to investigate if industries that share features of natural monopolies react differentially when confronted with competition. To assess this empirically, we use information from the Herfindahl indices at the 4-digit SIC industry-level from the US Census of Manufacturers for 1992. Presumably, changes in import competition could have differential effects in more concentrated industries.

Given that both the homogeneity and concentration measures are treated as if they were dictated by technological parameters, the specification we estimate is:

$$PBC_{ist} = \alpha + \beta Comp_{st} + \phi Tech_s * Comp_{st} + X'_{ist}\vartheta + d_i + d_t + \varepsilon_{ijt} \qquad (5)$$

Where $Tech_s$ is a dummy that captures our "technological" parameters (homogeneity or concentration) and ϕ identifies the differential effect of PMC across these variables.

We are also interested in finding out if PBC of firms with higher probabilities of default change differently in the presence of competition. We capture this idea empirically by investigating if firms with higher profitability perform differently. To limit potential interactions between changes in PMC and profitability, we split firms in our sample into two groups based on their profitability in the first year they appeared in our panel.

Finally, a number of specification checks are performed to assess if alternative firm characteristics affect the impact of product market competition on PBC, such as firm size, sales to asset intensity, market to book ratios, leverage, and whether firms belong to the manufacturing sector, where the disciplinary force of foreign competition is potentially stronger than in services.

III. C. Instrumental Variables

The specifications in equations (4) and (5) control for firm unobserved heterogeneity bias, and exploit the variation in competition within industries and firms. However, one might argue that since the voting premium is the result of forward-looking stock prices, they should already capture any foreseen changes resulting from competition. In consequence, fixed effects estimates would be biased towards zero and the true effect of competition should be larger. Alternatively, the estimates from a panel setting might be confounded by reverse causation arguments. To overcome these criticisms, we instrument for import penetration using exchange rates and terms of trade, which are correlated with import penetration but uncorrelated with the error in the measure of private benefits of control.

IV. Results

Table III.A presents the basic empirical relationship between our two measures of competition and the estimate of private benefits of control. When comparing firms according to how competitive their industries are (Rows A-D), there seems to be evidence that high import penetration environments are associated to lower estimated PBC. Interestingly, the bottom rows in Table III.A (E and F) highlight that the impact of product market competition on PBC might be symmetric, that is, low levels of product market regulation are correlated with low levels of PBC.

The average voting premium in the data is 0.37 while the average import penetration is 0.20. The negative correlation between import penetration and PBC is particularly clear when we either concentration on the top quartile of the sample in terms of import penetration (Row B) or when we use industry adjusted import penetration (Rows C and D), which as argued in previous sections, is more likely to capture the strength of product market competition. Average PBC in the top quartile of import penetration are equivalent to 0.26 relative to 0.40 for the rest of the

sample, a difference that is statistically significant at the 5-percent level. Splitting the sample in based on *IAIP*, yields similar results: the top 50-percent (25-percent) of firms based on *IAIP* have average PBC of 0.28 (0.16) relative to 0.45 (43.5) for other firms. Both differences are statistically different at conventional levels. These numbers indicate that the higher the industry adjusted import penetration, the lower the private benefits of control.

Similarly, in the sample for which we have the OECD *PMR* index, the average voting premium is 0.44, but it is as high as 1.1 in the top quartile of regulated industries (less subject to competition), relative to 0.22 in the rest of the sample. The difference of 0.88 is statistically significant and it is twice as large as the average premium in the sample, suggesting that product market regulations can potentially lead to higher PBC.

Table III.A. shows that regardless of which measure of competition we chose, namely "high" import penetration or "low" product market regulation, PBC are lower for firms in competitive environments. However, institutional differences across countries as well as differences in industry characteristics could be driving these differentials. We now proceed to address if these factors could account for this startling differences using IAIP and PMR as proxies for the strength of product market competition.

Column I of Table IV shows the effect of import penetration on the voting premium in a simple OLS regression framework, controlling exclusively for aggregate time-trends. The effect at the mean is -0.73, such that a 5 percentage point increase in import penetration relative to the industry average would translate in a reduction in PBC of 3.5 percentage points, or around 10 percent of the average PBC. This is significant at 1-percent level.

Columns II to IV introduce a set of variables that have been shown to explain differences in PBC across countries. In Column II the following variables in La Porta *et al*. (1998) and Dyck and Zingales (2004) are included: rule of law, anti-director rights and accounting standards (see Table I for a detailed description of these variables). Rule of law has an economically large and

statistically significant effect on reducing PBC, even controlling for industry fixed effect. This result is consistent with the existing literature. The point estimate suggests that moving from the rule of law index of Italy to the level of rule of law in Germany would reduce PBC by an average of 0.10 points. The indices of anti-directors rights and accounting standards, do significantly affect PBC. The estimated coefficient on the effect of product market competition is not affected by the inclusion of these additional controls.

Column III in Table IV introduces the main variables that Dyck and Zingales (2004) identify as significant determinants of PBC, namely newspaper circulation as proxy for the role of the media in limiting stealing, the level of tax compliance and a survey question relating to whether unfair competition is legally prevented. We find that PBC are significantly lower in countries where tax compliance is higher as well as in countries where competition laws are perceived as more developed. While the direction of these estimated coefficient is consistent with Dyck and Zingales (2004) our point estimates are larger which could be explained by the fact that they estimate PBC using control block sales. Interestingly, including their measure of competition does not eliminate the effect of import penetration: the estimated coefficient is now -0.98 and remains statistically significant at the 1-percent level. These results suggests, as expected, that competition is not a uni-dimensional variable and that it can affect PBC through different channels, in this case, through the quality of competition laws and the intensity of import penetration. One caveat, however, of the competition laws variable and other controls on Table IV is that they only have cross country variation, and therefore the room for omitted variable bias is considerable. This is minimized in our specification relative to the previously cited papers, to the extent that we also include industry dummies, and therefore the variation we are exploiting to identify these coefficients is the within industry variation across countries of the relevant explanatory variables.

Column IV shows that the effect of competition is stronger in countries with below average rule of law. This indicates that beyond the usefulness of regulation to curb PBC and improve governance, product market competition is an important mechanism to achieve the same goal, and that it is more effective in countries with weaker law and order tradition as measured by this variable.

Finally, Column V uses the OECD product market regulation index. Since this is only available for two years (1998 and 2003), the effective sample drops substantially even though the sample is no longer restricted to industries for which information on import penetration was available. It is important to remember that this index only varies by country so we effectively have 32 observations that are identifying the effect of the PMR index (17 for 1998 and 15 for 2003). In spite of the restrictive test, we find that firms in more highly regulated countries exhibit higher PBC.

The results in Table IV show a relationship between competition and PBC over and above other characteristics of countries and industry controls. However, these specifications do not take into account the following potential concerns: countries differ in ways that may be correlated with our estimate of PBC, firms themselves might be different and their differences might be confounding our findings, and the sample composition may be changing over time. To address these issues we turn to our panel specifications that include firm fixed effects.

The Column I in Table V yields a coefficient of -1.36 for the effect of industry adjusted import penetration on the voting premium. The coefficient is larger in absolute value than the one obtained in Table IV without controls for firm unobserved heterogeneity. It implies that a 5 percent increase *IAIP* will result in a reduction of 7 percentage points in PBC.

Column VII in Table V uses the same specification for the measure of product market regulation. It confirms in the panel setting that as a country becomes less regulated, PBC fall. The size of the effect is not negligible: an increase in competition equivalent to going from the level of PMR in Italy to the level observed in France would lead to a reduction in PBC of 0.40. The limited variation of this variable does not allow us to saturate the model further. As a result, the rest of the results of this paper concentrate on investigating the link between import penetration and PBC.

Why does product market competition matter?

An important question is whether we can correctly interpret the effect of product market competition on PBC as a disciplining effect. If the role of product market competition is to discipline controlling shareholders that under-perform, then we would expect that the effect should be larger in firms that are hardly profitable to begin with, relative to other firms might not be as poorly run or for which the probability of going out of business is not a real concern. Column II shows the extent of the impact of competition on PBC as a function of the initial profitability of firms at the point in which they first appear in our sample. We find that PBC hardly change in initially profitable firms, and that the bulk of the reduction in PBC is explained by firms that have low profitability prior to the increases in import penetration. This result suggests that the notion that competition provides a disciplining effect to insiders through the probability of default faced by their firms is supported by the data.

We further explore the specific channels through which the disciplinary effect of competition operates by investigating the differential effect that *IAIP* has on firms as a function of how homogenous or heterogeneous their industries are. Within industry homogeneity means that an equal increase in *IAIP* would reveal a lot more information about the true environment of firms to market participants relative to similar increases in *IAIP* for heterogeneous industries.

As a result, owners find it easier to benchmark firm performance against the information provided in the industry and they are more readily aware of the extent of the inefficiencies or fund diversion. In contrast, if competition does not convey valuable information, then we should not observe any difference between transparent relative to non-transparent industries.

To investigate this empirically we use Parrino (1997) homogeneity index, which is explained in detail in section III. In a nutshell, it provides a technological parameter for the transparency of the sector as it is calculated based on the within industry correlation of equity returns. Column II in Table V shows that the effect of import competition is stronger in industries with high homogeneity, where shocks in one firm are more likely to reveal relevant industry information. In fact, when we split the firms of our sample based on this index, we find that for the group of firms in heterogeneous industries, where it is harder to benchmark outcomes against those of competitors, increases in competition have no effect on PBC. This result provides empirical support to the idea that increases in competition can provide greater levels of information, which can then limit private benefits of control.

We test for an alternative technological variable that proxies the degree of economies of scale, namely the level of concentration of an industry in the U.S. High concentration industries in the U.S. –a country with arguably low institutional barriers to entry and at the edge of the technology frontier– reflect a large minimum efficient scale. It points to potential concentration in other countries and the likelihood that the sector tends towards a natural monopoly.

By extension, an increase in import penetration should have a higher impact in industries with high potential concentration, where waste and discretion are potentially larger. This is exactly what we find: the effect of import competition is associated to significant declines in PBC in concentrated industries.

Column V incorporates the variables on initial profitability, homogeneity and concentration concurrently. The results are unchanged, except for the fact that the effect for highly concentrated industries disappears. The bulk of the bite of product market competition on PBC seems to occur in homogeneous industries with low initial profitability. For these industries, the coefficient on *IAIP* is -4.25, which is considerably larger than the average effect in the whole sample as documented in Column I.

Column VI in Table V, introduces firm level controls for firm size (log of assets) and profitability (net income to assets) for those firms for which matching financial data from *Worldscope* was available. We find that PBC are larger in bigger firms and that the higher the net income in the panel setting, the lower the estimated PBC. The result is also consistent with the idea that firms with higher levels of net income –arguably the easiest measure of profits to contract upon– have fewer agency costs.

Table VI runs a series of robustness checks to assess whether the effect of competition varies with firm characteristics that are commonly found in the literature to be important in an array of settings, such as, firm size, sales to assets intensity, market to book ratios and leverage. To test for the effect of these variables, we split the sample in two based on each variable and allow for an interaction with *IAIP* to differ accordingly. In all the regressions in Table VI we control for the industry homogeneity effect that we documented in Table V.

These firm-level characteristics do not seem to be determining the impact of competition on PBC. The only significant interaction is for firms in manufacturing activities. Manufacturing firms are more responsive to increased import penetration relative to other firms, which seems natural given that services are arguably less exposed to effective direct competition from foreign entities through the import channel.

The previous results indicate that increased import competition reduces PBC, and this holds true controlling for firm fixed effects. The result is particularly strong in homogenous and concentrated industries and in low profitability firms. We have also shown that countries that deregulate their product markets observe significant declines in PBC. Moreover, the fact that the interaction between firm size and import penetration is not an important explanatory factor suggests that changes in the probability of control contests might not be driving our findings, since smaller firms are presumably more prone to takeovers.

Instrumental Variables

Up to this point, we have not addressed the concern that that our dependent variable is based on equity prices, which should contain all relevant available information related to competition at the time prices they are set, which includes investors expectations on foreign competition. If this were the case, then our panel results would underestimate the actual effect of competition. Furthermore, if PBC are an indicator of how well firms are run and this in turn determines the extent of import penetration (badly run firms have higher costs and therefore foreign firms can increase entry into the market more easily), then interpreting the panel estimated coefficient becomes problematic.

In order to address these issues, we instrument import penetration the indices of real exchange rates and the terms of trade from the World Bank. The idea is that changes in these instruments are unexpected shocks determined by macroeconomic conditions and exogenous to the firms in our sample. The second stage, therefore, estimates the effect of *unexpected* changes in competition, and gets around endogeneity concerns and the downward bias problem from perfect foresight of asset prices. Both the real effective exchange rate and the terms of trade variable contain information on price changes, but since these are not linearly related, including both measures yields a better fit in the first stage.

Table VII presents the results. As expected, the instrumental variables (IV) estimates are larger in absolute value in all regressions. If we concentrate on the panel IV estimates, the effect of import penetration first stage is most precise in the manufacturing regression (Columns V and VI). For this sub-sample we obtain a coefficient of -16.9, relative to -3 in the previous specifications earlier (the coefficient is -26 in the whole sample, but the first stage is extremely imprecise when we include non-manufacturing firms, leaving us potentially concerned about a weak instruments problem in that specification). In sum, instrumental variable estimates point to a causal effect of competition on private benefits of control, which is significantly larger than the estimated effect using within firm and cross-sectional specifications.

V. Conclusions

In this paper we examined the impact of product market competition on private benefits of control estimated using the voting premium between shares with differential voting rights. To capture the strength of competition in the product market we used an external measure of competition based on industry-level import penetration, and an internal metric based on a country-level index of the degree of government regulation in product markets.

We argued that this is a useful setting for testing the widespread belief that product market competition improves governance for the following reasons. First, there are few measures of governance arrangements that are as sharp as the value of private benefits of control as calculated using voting premiums. Second, existing evidence has found large differences in measures of private benefits across countries that have been explained as a function of the ability of insiders to divert firms' resources away from minority investors (Nenova (2003), Dyck and Zingales (2004) and Doidge (2004)). Third, the strength of import penetration varies both across industries and in time, and it is prone to vary with currency fluctuations.

We documented a strong and robust negative correlation between our measures of product market competition and estimates of private benefits of control. Moreover, we showed that the impact of product market competition on voting premiums is particularly strong for firms in industries that are likely to be concentrated and in countries with poor legal environments (La Porta *et al*. (1998)).

We then assessed if the specific channels that have been previously suggested in the theoretical literature as conducive to enhanced governance find support in the data. We found that improvements in the availability of industry information and the higher probability of default associated with stiffer competition are two important forces in reducing the estimated price gap between dual-class shares.

Overall, our findings provide empirical support to the idea that product market competition can discipline insiders of publicly traded corporations. 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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TABLE I. DESCRIPTION OF VARIABLES

Variable	Definition	Source
Voting Premium	$PBC = \frac{P_H - P_L}{P_L - rv * P_H}$ 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 two types of share	Share price data from Datastream
Industry-adjusted Import penetration (IAIP)	Import penetration in a country, sector and year less the average import penetration for the relevant 3-digit industry. Import penetration is the ratio of the value of imports relative to the value of imports plus the value of local production at the 3-digit level	OECD Structural Analysis Database UNIDO Industrial Demand-Supply Balance Database
Product market regulation	OECD index measuring the degree to which governments promote or inhibit competition at the country-level, available for 1998 and 2003	OECD Conway, Janod and Nicoletti (2005)
Rule of law	"Assessment of the law and order tradition in the country produced by the country risk rating agency International Country Risk (ICR). Average of the months of April and October of the monthly index between 1982 and 1995. Scale from zero to ten with lower scores for less tradition for law and order (we changed the scale from its original range going from zero to six)." La Porta et al. (1998)	La Porta, et al. (1998), from: International Country Risk guide. Dyck and Zingales (2004)
Antidirector rights	"An index aggregating shareholder rights formed by adding 1 when (1) the country allows shareholders to mail their proxy vote to the firm, (2) shareholders are not required to deposit their shares prior to the general shareholder's meeting, (3) cumulative voting or proportional representation of minorities in the board of directors is allowed, (4) an oppressed minorities mechanism is in place, (5) the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholder's meeting is less than or equal to 10 percent (the sample median), or (6) shareholders have preemptive rights that can be waived only by a shareholders' vote. The index ranges from zero to six."	La Porta, et al. (1998) based on company law or commercial code Dyck and Zingales (2004)
Accounting standards	"Index created by examining and rating companies' 990 annual reports ontheir inclusion or omission of 90 items. These items fall into seven categories (general information, income statements, balance sheets, funds flow statement, accounting standards, stock data, and special items). A minimum of three companies in each country were studied. The companies represent a cross section of various industry groups; industrial companies represented 70 percent, and financial companies represented the remaining 30 percent." La Porta et al. (1998).	La Porta, et al. (1998) from International Accounting and Auditing Trends Center for International Financial Analysis and Research
Newspaper circulation/pop	Circulation of daily newspapers/population	Dyck and Zingales (2004) from UNESCO Statistical yearbook 1996
Tax compliance	"Assessment of the level of tax compliance. Scale from 0 to 6 where higher scores indicate higher compliance. Data is for 1995." La Porta et al. 1999.	Dyck and Zingales (2004)
Competition laws	Response to survey question, "competition laws prevent unfair competition in your country" Higher scores suggest agreement that competition laws are effective.	Dyck and Zingales (2004)
Low Homogeneity	Dummy equal to one if the homogeneity index is below the average (correlation between stock returns of US firms within an industry at 2 digit SIC), computed as in Parrino (1997) for the period 1980-2003	Center for Research in Security Prices (CRSP)
High initial profitability	Dummy equal to one if net income to sales at the beginning of the sample is above the median of all firms in the sample.	Authors' calculations based on firms in sample (Worldscope)
High industry concentration	Dummy equal to one if the firm is in a sector where the Herfindahl index computed on US firms is above the average	US Census of Manufactures 1992
Small size	Dummy equal to one if the firm's average log of sales is below the sample average.	Authors' calculations based on firms in sample (Worldscope)
Low asset intensity	Dummy equal to one if the firm's average sales over assets is below the sample average.	Authors' calculations based on firms in sample (Worldscope)
High market to book	Dummy equal to one if the firm's market value plus total liabilities divided by the book value is above the sample average.	Authors' calculations based on firms in sample (Worldscope)
Low leverage	Dummy equal to one if the firm's leverage (total liabilities to assets) is below the sample average.	Authors' calculations based on firms in sample (Worldscope)

TABLE II. SUMMARY STATISTICS

Column I contains the total number of firms we identified with dual-class shares and price information from Datastream and Compustat Global. Column II presents the estimated voting premium (as defined in equation 1) in that sample. Column III shows the average voting premium by country estimated by Doidge (2004). Column IV shows the number of firms in the sample for which there import penetration information is available, and column V the corresponding voting premium. Column VI shows the country averages of import penetration, which is the ratio of the value of imports relative to the value of imports plus the value of local production at the 3-digit industry by country and year. Column VII shows country averages of industry-adjusted import penetration, i.e. import penetration less the average import penetration for the relevant 3-digit industry. Column VIII shows the country averages of Product Market Regulation, an OECD index that measures the degree to which governments promote or inhibit competition at the country-level, available for 1998 and 2003 and ranging from 1 to 6. Column VII shows the Rule of Law index per country as defined in Table 1. The second panel reports the correlation between the different variables in the sample.

Country	Number of Firms with Dual share data	Estimated Voting Premium	Voting Premium Doidge (2004)	Number of Firms in Sample	Estimated Voting Premium	Import Penetration	Industry-Adjusted Import Penetration	Product Market Regulation	Rule of Law
	I	II	III	IV	V	VI	VII	VIII	IX
Australia	4	0.216	0.155	4	0.154	0.151	-0.021	1.129	10
Austria	14	0.408	0.366	14	0.338	0.270	0.060	1.660	10
Brazil	167	0.160	0.253	11	-0.036	0.683	0.530	.	6.32
Canada	45	0.093	0.119	45	0.064	0.217	-0.012	1.298	10
Chile	6	0.084	0.085	.	.	.	.	.	7.02
Colombia	6	0.290	0.295	.	.	.	.	.	2.08
Denmark	33	0.155	0.088	32	0.261	0.228	0.031	1.300	10
Finland	19	0.241	0.072	19	0.323	0.153	-0.079	1.678	10
France	6	0.473	0.404	6	0.509	0.278	-0.056	2.100	8.98
Germany	67	0.201	0.155	67	0.181	0.190	-0.067	1.648	9.23
Italy	68	0.538	0.491	67	0.496	0.156	-0.136	2.366	8.33
Korea	128	0.512	0.670	128	0.753	0.166	-0.128	2.006	5.35
Mexico	18	0.149	0.008	16	0.299	0.313	0.010	2.303	5.35
Norway	15	0.120	0.042	15	0.395	0.124	-0.033	1.650	10
Peru	1	0.276	.	.	.	.	.	.	2.5
Portugal	6	0.049	0.065	6	-0.046	0.126	-0.037	1.873	8.68
South Africa	16	0.043	0.076	2	-0.020	0.340	0.012	.	4.42
Sweden	59	0.067	0.045	59	0.061	0.221	-0.039	1.500	10
Switzerland	24	0.458	0.162	23	1.183	.	.	2.059	10
Turkey	1	0.579	.	1	0.693	.	.	3.100	5.18
United Kingdom	24	0.350	0.157	24	0.259	0.234	-0.011	1.009	8.57
United States	16	0.038	.	15	0.054	0.159	-0.138	1.300	10
Venezuela	6	0.221	0.134	.	.	.	.	.	6.37
Correlation with Column (II)			0.820		0.796				
Correlation with Column (V)						**-0.323**	**-0.415**	**0.567**	**-0.049**

TABLE III.A. PRIVATE BENEFITS OF CONTROL BY ALTERNATIVE MEASURES OF PRODUCT MARKET COMPETITION

The measure of PBC used is the voting premium between shares of differential voting rights as defined in equation (1). The average is computed for different group of firms according to the level of competition, measured as import penetration (A,B), industry-adjusted import penetration (C,D) or the index of Product Market Regulation (E,F). Import penetration is the ratio of the value of imports relative to the value of imports plus the value of local production at the 3-digit industry by country and year. Industry-adjusted import penetration is import penetration by country, sector and year less the average import penetration for the relevant 3-digit industry. Product market regulation is an OECD index (from 1 to 6) of the degree to which governments promote competition by country, available for 1998 and 2003. Standard errors are in parentheses, clustered by industry-country (rows A to D) and by country (rows E and F). The number of observations for each sub-sample is reported in square brackets.

	Measures of competition	All	0	1	Difference	Mann Whitney |z|
A	=1 Firms in a top 50 percent import penetration, 0 otherwise	0.3659 ***	0.394 ***	0.338 ***	-0.056	3.636 ***
	Level of import penetration, based on firms in sample	*(0.038)*	*(0.053)*	*(0.055)*	*(0.076)*	
		[3011]	[1506]	[1505]		
B	=1 Firms in a top quartile import penetration, 0 otherwise		0.403 ***	0.255 ***	-0.148 **	7.201 ***
	Level of import penetration, based on firms in sample		*(0.045)*	*(0.058)*	*(0.069)*	
			[2258]	[753]		
C	=1 Firms in a top 50 percent import penetration, 0 otherwise		0.454 ***	0.278 ***	-0.176 **	10.315 ***
	Industry-adjusted import penetration, based on firms in sample		*(0.051)*	*(0.053)*	*(0.073)*	
			[1506]	[1505]		
D	=1 Firms in a top quartile import penetration, 0 otherwise		0.435 ***	0.158 ***	-0.277 ***	9.945 ***
	Industry-adjusted import penetration, based on firms in sample		*(0.045)*	*(0.038)*	*(0.052)*	
			[2259]	[752]		
E	=1 Firms in the top 50 percent by product market regulation	0.4358 **	0.215 ***	0.658 **	0.443 *	7.168 ***
	0 otherwise, based on firms in sample	*(0.164)*	*(0.059)*	*(0.289)*	*(0.247)*	
		[984]	[494]	[490]		
F	=1 Firms in the top quartile by product market regulation		0.218 ***	1.099 **	0.881 **	11.791 ***
	0 otherwise, based on firms in sample		*(0.046)*	*(0.365)*	*(0.329)*	
			[741]	[243]		

* Significant at 10%; ** significant at 5%; *** significant at 1%

TABLE III.B. ALTERNATIVE MEASURES OF PRODUCT MARKET COMPETITION

The dependent variable in rows A and B is the import penetration ratio, defined as the value of imports relative to the value of imports plus the value of local production at the 3-digit industry by country and year. In rows C and D it is the industry-adjusted import penetration defined as import penetration by sector, country and year less the average import penetration for the relevant 3-digit industry. In rows E and F it is the OECD index (from 1 to 6) of product market regulation, which measures the degree to which governments promote or inhibit competition at the country-level, available for 1998 and 2003. Standard errors are in parentheses, clustered by industry-country (rows A to D) and by country (rows E and F). The number of observations for each sub-sample is reported in square brackets.

	Measures of competition	All	0	1	Difference
A	=1 Firms in a top 50 percent import penetration, 0 otherwise	0.199 ***	0.0843 ***	0.3137 ***	0.229 ***
	Level of import penetration, based on firms in sample	*(0.012)*	*(0.006)*	*(0.016)*	*(0.017)*
		[3011]	[1506]	[1505]	
B	=1 Firms in a top quartile import penetration, 0 otherwise		0.1301 ***	0.4055 ***	0.275 ***
	Level of import penetration, based on firms in sample		*(0.008)*	*(0.024)*	*(0.026)*
			[2258]	[753]	
C	=1 Firms in a top 50 percent import penetration, 0 otherwise	-0.059 ***	-0.1562 ***	0.0383 ***	0.195 ***
	Industry-adjusted import penetration, based on firms in sample	*(0.012)*	*(0.008)*	*(0.017)*	*(0.019)*
		[3011]	[1506]	[1505]	
D	=1 Firms in a top quartile import penetration, 0 otherwise		-0.1104 ***	0.0956 ***	0.206 ***
	Industry-adjusted import penetration, based on firms in sample		(0.008)	(0.030)	*(0.031)*
			[2259]	[752]	
E	=1 Firms in the top 50 percent by product market regulation	1.759 ***	2.193 ***	1.330 ***	-0.863 ***
	0 otherwise, based on firms in sample	*(0.122)*	*(0.113)*	*(0.057)*	*(0.090)*
		[984]	[490]	[494]	
F	=1 Firms in the top quartile by product market regulation		1.509 ***	2.525 ***	1.016 ***
	0 otherwise, based on firms in sample		*(0.061)*	*(0.088)*	*(0.080)*
			[741]	[243]	

* Significant at 10%; ** significant at 5%; *** significant at 1%

TABLE IV. INSTITUTIONAL DETERMINANTS OF PRIVATE BENEFITS OF CONTROL

The dependent variable is the voting premium between shares of differential voting rights as defined in equation (1). Industry-adjusted import penetration (*IAIP*) is import penetration less the average import penetration for the relevant 3-digit industry, where import penetration is the ratio of the value of imports relative to the total value of imports plus the value of local production at the 3-digit industry by country, sector and year. Product market regulation (*PMR*) is an OECD index that measures the degree to which governments promote or inhibit competition at the country-level, available for 1998 and 2003, ranging from 1 to 6 and where higher values indicate more regulation. The description of rule of law, anti-directors rights, accounting standards, news paper circulation/pop, tax compliance, competition laws are provided in Table I. Above-average rule of law is an indicator variable equal to one for observations with above average rule of law with respect to the sample. Columns I to IV (V) report all firms with information on *IAIP* (*PMR*)., where available. Standard errors are in parentheses, clustered by industry-country (columns I to IV) and by country (column V).

	Dependent variable: voting premium				
	I	II	III	IV	V
Industry-adjusted import penetration (IAIP)	-0.7307 *** *(0.1916)*	-0.6933 *** *(0.1623)*	-0.9815 *** *(0.2162)*	-1.1245 *** *(0.1996)*	
Product market regulation					0.632 * *(0.3580)*
Rule of law		-0.1109 *** *(0.0265)*			
Antidirector rights		-0.0389 *(0.0350)*			
Accounting standards		0.0003 *(0.0040)*			
Newspaper circulation/pop			0.0581 *(0.0422)*		
Tax compliance			-0.1308 * *(0.0764)*	-0.1305 ** *(0.0567)*	
Competition laws			-0.2832 *** *(0.1057)*		
Above average rule of law				-0.4201 *** *(0.1022)*	
Above average rule of law * IAIP				0.6574 * *(0.3696)*	
Year controls	Yes	Yes	Yes	Yes	Yes
Industry controls	No	Yes	Yes	Yes	Yes
Observations	3011	3011	3011	3011	984
R-squared	0.05	0.279	0.264	0.281	0.35

* Significant at 10%; ** significant at 5%; *** significant at 1%

TABLE V. INDUSTRY AND FIRM DETERMINANTS OF PRIVATE BENEFITS OF CONTROL

The dependent variable is the voting premium between shares of differential voting rights as defined in equation (1). Industry-adjusted import penetration (*IAIP*) is import penetration less the average import penetration for the relevant 3-digit industry, where import penetration is the ratio of the value of imports relative to the value of imports plus the value of local production by 3-digit industry, country and year. Product market regulation (*PMR*) is an OECD index that measures the degree to which governments promote or inhibit competition at the country-level, available for 1998 and 2003, ranging from 1 to 6 and where higher values indicate more regulation. The description of low homogeneity, high industry concentration and high initial profitability are provided in Table I. *Ln* of assets is the natural logarithm of firm sales in U.S. dollars and net income to assets is the ratio of net income to assets from *Worldscope*, where available. Columns I to VI (VII) report all firms with information on *IAIP* (*PMR*), where available. Standard errors are in parentheses, clustered by industry-country (columns I to VI) and by country (VI).

	Dependent variable: voting premium						
	I	II	III	IV	V	VI	VII
Industry-adjusted import penetration (IAIP)	-1.3564 * *(0.7925)*	-4.8726 *** *(0.8673)*	-2.4121 ** *(0.9612)*	0.5704 *(1.0191)*	-4.2472 *** *(1.5420)*	-2.0552 * *(1.1942)*	
Product market regulation							1.5309 ** *(0.7408)*
High initial profitability * IAIP		4.7655 *** *(1.1732)*			3.1658 ** *(1.2611)*		
Low homogeneity * IAIP			2.5307 * *(1.4889)*		3.2015 ** *(1.3443)*	3.6818 *** *(1.3721)*	
High industry concentration * IAIP				-3.0288 ** *(1.3836)*	-1.0846 *(1.4435)*		
Ln assets						0.0390 ** *(0.0164)*	
Net income to assets						-0.3856 *** *(0.1476)*	
Year controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3011	2788	3011	2443	2266	1734	984
R-squared	0.604	0.61	0.606	0.545	0.544	0.833	0.799

* Significant at 10%; ** significant at 5%; *** significant at 1%

TABLE VI. FIRM-LEVEL DETERMINANTS OF PRIVATE BENEFITS OF CONTROL

The dependent variable is the voting premium between shares of differential voting rights as defined in equation (1). Industry-adjusted import penetration (*IAIP*) is import penetration less the average import penetration for the relevant 3-digit industry, where import penetration is the ratio of the value of imports relative to the value of imports plus the value of local production by 3-digit industry, country and year. The description of low homogeneity is provided in Table I. High or low are indicator variables for a given firm's position (sample average) relative to the sample for each of the following variables: size (log of sales), asset intensity (sales over assets), market to book (market value of equity plus total liabilities over the book value of assets), leverage (total liabilities to assets). Non-manufacturing is an indicator variable equal to one if the relevant firm is an industry outside manufacturing. Firm level information is from *Worldscope*, where available. Standard errors are in parentheses, clustered by industry-country.

	Dependent variable: voting premium				
	I	II	III	IV	V
Industry-adjusted import penetration (IAIP)	-2.8406 *** *(1.0198)*	-3.088 *** *(1.0519)*	-2.8951 *** *(1.0569)*	-2.4053 ** *(0.9484)*	-3.005 *** *(1.0766)*
Low homogeneity * IAIP	2.6141 * *(1.4356)*	2.2982 *(1.4901)*	4.1767 *** *(1.4007)*	2.5297 * *(1.4873)*	3.0893 ** *(1.5513)*
Small size * IAIP	0.8617 *(1.0798)*				
Low asset intensity * IAIP		1.1686 *(1.0975)*			
High market to book * IAIP			0.2383 *(1.4507)*		
High leverage * IAIP				-0.0089 *(0.1637)*	
Non-manufacturing * IAIP					2.7226 ** *(1.1344)*
Year controls	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	3011	3011	3011	3011	3011
R-squared	0.606	0.606	0.609	0.606	0.607

* Significant at 10%; ** significant at 5%; *** significant at 1%

TABLE VII. PRIVATE BENEFITS OF CONTROL AND IMPORT PENETRATION (IV)

The dependent variable is the voting premium between shares of differential voting rights as defined in equation (1). The Industry-adjusted import penetration (*IAIP*) is import penetration by country, sector and year less the average import penetration for the relevant 3-digit industry, where import penetration is the ratio of the value of imports relative to the value of imports plus the value of local production by 3-digit industry, country and year. *IAIP* is instrumented with the effective exchange rate and terms of trade variables. The results of the first stage are presented in the second panel of the table and the first panel shows the instrumental variable estimates of the effect of *IAIP* on the voting premium. Real effective exchange is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs from the World Development Indicators. Terms of trade are the weighted average of a nation's export prices relative to its import prices from the World Development Indicators. Standard errors are in parentheses, clustered by country (I, II, III and VI). Columns III, V and VI restrict the sample to the manufacturing sector.

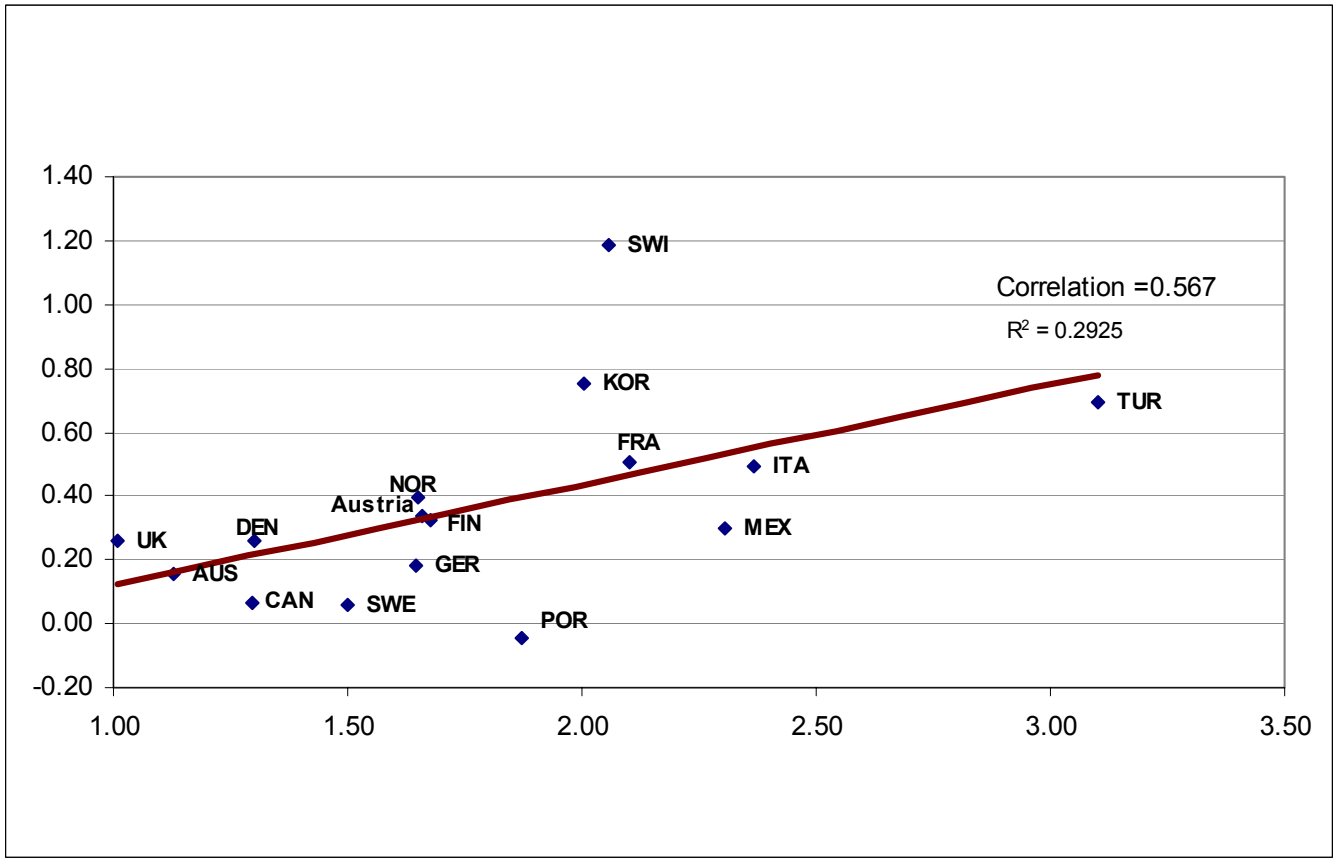
	Dependent variable: voting premium					
	I	II	III	IV	V	VI
Second Stage	**All**	**All**	**Manufacturing Only**	**All**	**Manufacturing Only**	**Manufacturing Only**
Industry-adjusted import penetration (IAIP)	-7.6433 ** [2.5180]	-5.7568 * [2.6957]	-10.9868 ** [4.7319]	-26.4637 *** [8.3073]	-16.8938 *** [4.1126]	-16.8938* * [8.0923]
Year controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	No	Yes	Yes	-	-	-
Country controls	No	No	Yes	-	-	-
Firm controls	No	No	No	Yes	Yes	Yes
Observations	2726	2726	2338	2726	2338	2338
First stage						
Effective exchange rate	0.00089 *** [0.00020]	0.00084 *** [0.00016]	0.00012 [0.00020]	0.00019 *** [0.00007]	0.0002 ** [0.00008]	0.0002 ** [0.00008]
Terms of trade	0.0014 *** [0.00023]	0.00174 *** [0.00018]	0.00072 *** [0.00027]	0.00013 [0.00008]	0.00042 *** [0.00011]	0.00042 *** [0.00011]

* Significant at 10%; ** significant at 5%; *** significant at 1%

FIGURE I. VOTING PREMIUMS AND PRODUCT MARKET COMPETITION (PRODUCT MARKET REGULATION)

Voting premiums are calculated using shares with differential voting rights as defined in equation (1). Product market regulation (*PMR*) is an OECD index that measures the degree to which governments promote or inhibit competition at the country-level, available for 1998 and 2003, ranging from 1 to 6 and where higher values indicate more regulation.

Voting Premium



← Increases in product market competition

FIGURE II. VOTING PREMIUMS AND PRODUCT MARKET COMPETITION (IMPORT PENETRATION)

Voting premiums are calculated using shares with differential voting rights as defined in equation (1). Industry-adjusted import penetration (*IAIP*) is import penetration less the average import penetration for the relevant 3-digit industry, where import penetration is the ratio of the value of imports relative to the value of imports plus the value of local production by 3-digit industry, country and year.