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ABSTRACT

Do antitrust laws influence corporate valuations? We evaluate the relationship between firm value and laws limiting firms from engaging in anticompetitive agreements, abusing dominant positions, and conducting M&As that restrict competition. Using firm-level data from 99 countries over the 1990-2010 period, we discover that valuations rise after countries strengthen competition laws. The effects are larger among firms with more severe pre-existing agency problems: firms in countries with weaker investor protection laws, with weaker firm-specific governance provisions, and with greater opacity. The results suggest that antitrust laws that intensify competition exert a positive influence on valuations by reducing agency problems.

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1. Introduction

Policymakers increasingly call for reforms to strengthen antitrust laws. For example, the U.S. House Judiciary Committee's Antitrust Subcommittee (2020) concluded a 16-month investigation by stressing the need to strengthen antitrust laws, policies, and enforcement. Furthermore, recent news reports indicate that Democrats and Republicans in the U.S. Congress are considering major reforms to antitrust laws (e.g., Tracy and Kendall, 2021). In Europe, European Union and United Kingdom authorities have also signaled their intent to pursue new legislation to address alleged anticompetitive behavior to promote customer welfare and innovation (e.g., Schechner, 2020). Japan's Fair Trade Commission also signaled its intention to coordinate with the U.S. and Europe in strengthening antitrust laws (Kihara and Wada, 2020). In China, the State Administration for Market Regulation issued a draft of new guidelines to stop monopolistic behaviors.¹ The push for stronger antitrust laws raises questions about the impact of such reforms on firms, customers, workers, and economic growth. This paper provides what we believe is the first analysis of how changes in antitrust laws shape corporate valuations.

Influential theories offer distinct predictions regarding the impact of antitrust laws that intensify competition on firm value. The agency view holds that competition spurs improvements in governance that boost valuations. Specifically, competition forces inefficient firms out of markets and potentially into bankruptcy. As a result, competition encourages firms to reduce inefficiencies, including inefficiencies associated with agency problems that allow managers to shirk, empire-build, tunnel, and extract private benefits from the firms at the expense of shareholder value (Alchian, 1950; Fama, 1980; Fama and Jensen, 1983; Shleifer and Vishny, 1997). Research also stresses that competition can generate information on managerial performance that shareholders use to mitigate agency problems (Holmstrom, 1982; Hart, 1983).

In contrast, other theories highlight how competition can reduce firm value. Intensifying competition tends to reduce market power, squeezing cash flows and profits (Irvine and Pontiff

¹ <https://www.china-briefing.com/news/china-releases-anti-monopoly-guidelines-for-its-platform-economy/>

2009). By reducing cash flows, competition can also constrain firms from exploiting growth opportunities, reducing firm value (Salop 1977; Dixit and Stiglitz 1977). Furthermore, intensifying competition can increase default risk by reducing the monopoly rents of incumbent firms (Raith 2003; Gaspar and Massa 2006). In this way, competition can discourage investment in projects that only payoff by extracting monopoly rents over long periods, such as R&D investments (Aghion et al., 2005). Several authors stress that the overall impact of product market competition on agency problems is theoretically ambiguous (Scharfstein, 1988; Hermalin, 1992; Schmidt, 1997). These conflicting theoretical predictions about the impact of competition laws on firm value help motivate our empirical examination.

In this paper, we examine the impact of antitrust laws that intensify competition on corporate valuations. We exploit the panel dataset compiled by Bradford and Chilton (2018) and Bradford et al. (2019) on laws regulating competition among firms. The dataset covers more laws, countries, and years than other datasets on competition laws. From the individual laws, Bradford et al. (2019) create an overall index of the legal and regulatory risks facing firms engaging in anticompetitive activities. This *Competition Law Index* measures the degree to which antitrust laws and authorities limit firms from engaging in anticompetitive agreements, abusing dominant positions, and conducting mergers and acquisitions that restrict competition. Increases in the *Competition Law Index* signify more stringent antitrust laws that foster competition among firms. Indeed, using data on the *Competition Law Index* for 90 countries from 1990 through 2010, we find that increases in the *Competition Law Index* are associated with subsequent increases in product market competition. Specifically, we estimate the relationship between the *Competition Law Index* and the Herfindahl-Hirschman index of industry concentration. We find a positive association between increases in *Competition Law Index* and subsequent reductions in product market concentration.

Our baseline analyses evaluate the association between firm value and the *Competition Law Index*. We measure firm value using *Tobin's Q*, which equals the book value of total assets plus the market value of equity minus the book value of equity, divided by the book value of

total assets (e.g., Morck, Shleifer, and Vishny 1988; Gompers, Ishii, and Metrick 2003). The baseline regressions include numerous controls to isolate the independent relationship between competition laws and corporate valuations. We include firm and industry-time fixed effects to condition out time-invariant firm characteristics (such as corporate culture) and time-varying industry factors (such as economic or technological shocks). The regressions also include annual Gross Domestic Product per capita and the following time-varying firm traits: size, age, leverage, and profitability.

We find a positive and economically meaningful connection between the stringency of antitrust laws and firm values. The coefficient estimates imply that a one-standard-deviation increase in the *Competition Law Index* leads to a rise of 0.12 in *Tobin's Q*, equivalent to approximately 13% of the sample standard deviation of *Tobin's Q* and 8% of the sample mean of *Tobin's Q*. The results hold when including or excluding the firm, industry, and country controls noted above. In robustness tests, we control for the following additional country factors: financial development (stock market development, credit market development), economic and business freedom (e.g., property rights, government integrity, business freedom, labor freedom, monetary freedom, trade freedom, investment freedom, and financial freedom), and tax treatment of shareholder income (capital gains tax, dividend tax). The results hold when controlling for these additional variables sequentially or simultaneously. Finally, we find no evidence of reverse causality. Corporate valuations do not predict changes in competition laws.

We enhance our identification strategy by evaluating the mechanisms underlying the agency view. The agency view holds that intensifying competition laws induces more intense competition that mitigates agency problems, boosting valuations. The baseline results establish a positive relationship between competition laws stringency and valuations. However, they do not show that intensifying competition laws increases valuations by reducing agency frictions. To evaluate the underlying mechanisms, we assess whether the association between competition laws and corporate valuations varies across countries, firms, and industries in ways consistent with the agency view.

We begin by evaluating a corollary of the agency view: intensifying competition will improve governance and boost valuations more when there are larger pre-existing agency frictions. The intuition for this corollary is that competition will not materially reduce agency frictions if other corporate governance mechanisms have already alleviated those problems. To assess this corollary, we examine whether the association between competition laws and corporate valuations is stronger among (a) firms in countries with weaker investor protection laws that impede sound corporate governance, (b) firms with weaker firm-specific governance provisions, and (c) more opaque firms, as informational asymmetries tend to enhance the manifestation of agency frictions.

The evidence is strongly consistent with the agency view's corollary that making antitrust laws more stringent boosts corporate valuations more when there are larger pre-existing agency problems. First, we discover that the competition-valuation connection is more pronounced in economies with weaker investor protection laws. We measure the strength of a country's investor protection laws using the *Anti-Director Rights* index initially developed by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998) and later modified by Djankov et al. (2008). The *Anti-Director Rights* index gauges the extent to which laws protect minority shareholders against management. Research suggests that stronger investor protection laws reduce agency problems (La Porta et al. 2002; Shleifer and Wolfenzon 2002). Consistent with the agency view, we find that the competition-valuation nexus is stronger in countries with weaker investor protection laws.

Second, and consistent with the agency view, we find that the competition-valuation nexus is stronger among firms with weaker firm-specific governance mechanisms. We consider three firm-specific governance indicators. *Internal Monitoring and Governance* measures the extent to which a company structures its board of directors (e.g., size, independence, committees, etc.) and executive compensation policies to mitigate agency problems. *Equal Shareholder Rights* measures the extent to which a company grants equal voting rights to shareholders. *Managerial Entrenchment* gauges the extent to which a company's governance provisions

insulate managers from the disciplinary threat of removal. We construct *Managerial Entrenchment* using corporate provisions that past research shows facilitate entrenchment (Gompers, Ishii, and Metrick 2003; Bebchuk, Cohen, and Ferrell 2008). These provisions include poison pills, blank checks, supermajority votes, golden parachutes, limited shareholder rights to call for special meetings, and classified boards. These three firm-specific governance indicators yield the same result: intensifying competition laws exerts a larger boost in valuations among firms with weaker governance mechanisms.

Third, our findings on corporate opacity lend further support to the view that competition boosts valuations by reducing agency problems. Informational asymmetries help managers extract private benefits with adverse ramifications on corporation valuations. The agency view holds that the value-enhancing effects of competition will be larger among more opaque firms. To assess this prediction, we use four firm-specific measures of opacity. *Industrial Tangibility* equals the ratio of tangible assets (property, plant, and equipment) to total assets. Since tangible assets are typically easier for outside investors to evaluate than intangible assets, researchers often interpret higher values of *Industrial Tangibility* as indicating less opacity. *Analyst Coverage* equals the number of analysts following the firm. Holding other features about the firm constant, more analysts typically imply greater information production about the firm and hence less opacity. For the next two measures of opacity, we use indicators of earnings management based on Jones (1991) and Dechow, Sloan, and Sweeney (1995). An extensive literature (e.g., Leuz and Wysocki 2016) uses earnings management to proxy for opacity. We discover that more stringent antitrust laws boost firm values more for firms that have (a) less asset tangibility, (b) a smaller number of analysts following the firm, and (c) a greater degree of earnings management.

We next evaluate another corollary of the agency view. Suppose making competition laws more stringent boosts valuations by intensifying competition and ameliorating agency problems. In this case, the impact of competition laws on valuations should be smaller among firms operating in industries that were already highly competitive before the change in

competition laws. At the extreme, strengthening antitrust laws should have no impact on valuations in perfectly competitive industries, according to the agency view. To assess this corollary, we examine the relationship between valuations and competition laws while differentiating by the degree of pre-existing industry competition. We measure industry competition using the value of *HHI* for each country-industry in the initial year of the sample. We find that intensifying competition laws disproportionately boosts valuations among firms in more concentrated industries. Moreover, these effects are especially pronounced in economies with greater pre-existing agency frictions. We find that intensifying competition laws disproportionately boosts valuations more among firms that are both (a) in economies with greater pre-existing agency frictions and (b) in less competitive industries.

As a final test, we examine the relationship between competition laws and firm-specific measures of operating efficiency. That is, we provide direct evidence on how making antitrust laws more stringent shapes firm behaviors. We use two operating efficiency measures. *Selling, General & Administrative Expenses/Sales* includes expenditures on items not directly involved in the manufacturing of goods or the provision of services, such as marketing and advertising expenses. The second measure, *Staff Costs/Sales*, equals wages paid to employees and other labor-related costs (such as employee benefits, pension expense, profit-sharing expense, insurance, etc.) divided by total sales. These measures, albeit imperfect, are often used to gauge firms' operating performance and managerial slack and shed additional empirical light on why intensifying competition laws is associated with subsequent increases in corporate valuations.

We discover that intensifying competition laws is associated with improved operational efficiency among firms in economies with weaker investor protection laws. In the regressions where the dependent variable is either *Selling, General & Administrative Expenses/Sales* or *Staff Costs/Sales*, *Competition Law Index* enters negatively and significantly. The interaction term, *Competition Law Index * Anti-Director Rights*, enters positively and significantly. These findings are consistent with the agency view: strengthening antitrust laws lowers operating costs more in economies with weaker shareholder protection laws.

Our work relates to but is distinct from several lines of research. Giroud and Mueller (2010; 2011) show that weakening the governance of firms reduces operating performance, stock returns, and valuations among U.S. firms, but only in non-competitive industries. Relatedly, Kadyrzhanova and Rhodes (2011) show for a sample of U.S. firms that the impact of governance provisions on firm value depends on whether the provisions allow managers to delay takeovers and differs by industrial concentration. The focus of these studies is the relationship between corporate governance and firm value, and whether this relationship varies by industrial competition. Our study focuses instead on how reforms on competition laws affect corporate valuations. Furthermore, while extensive research explores the relationship between competition and governance, performance, and firm value (e.g., Nickell, 1996; Sundaram, John, and John, 1996; Aggarwal and Samwick, 1999; Blundell, Griffith, and Van Reenen, 1999), these studies provide mixed evidence on the competition-valuation nexus, and do not examine the effects of antitrust laws. Our research evaluates the relationship between reforming competition laws on firm value. Furthermore, we test whether the association between competition laws and corporate valuations varies across countries, firms, and industries in ways consistent with the agency view of the competition law and valuation nexus.

2. Data

This section discusses the data used in the main analyses. In later sections, we describe the data used in extensions that examine firm-specific corporate governance and opacity measures.

2.1. Tobin's Q

Tobin's Q equals the book value of total assets plus the market value of equity minus the book value of equity, divided by the book value of total assets. The market value of equity equals the stock price multiplied by the total number of shares outstanding. We obtain these data from

the Thomson Reuters Worldscope database. An extensive body of theoretical and empirical research uses *Tobin's Q* to measure corporate performance and valuations, including Morck, Shleifer, and Vishny (1988), Lang and Stulz (1994), Kaplan and Zingales (1997), La Porta et al. (2002), Gompers, Ishii, Metrick (2003), Doidge, Karolyi, and Stulz (2004), and Fabisik et al. (2021). Many researchers stress that Tobin's Q has advantages over accounting-based valuation metrics because it is based on market prices that reflect both the level and risk of a firm's expected future profits (e.g., McFarland, 1988; Wernerfelt and Montgomery 1988).

2.2. *Competition law index (CLI)*

Bradford and Chilton (2018) and Bradford et al. (2019) compile data on statutory laws regulating competition among firms for 123 countries from 1888 through 2010. They first collect all competition laws starting from the first competition law in each country. For example, the first antitrust law in the U.S. is the Sherman Act of 1890. They then codify the content of each of those laws. The dataset includes information on substantive provisions concerning anticompetitive agreements, abuse of dominant positions, controls on mergers, and the authority to address and remedy violations of those laws.

Bradford and Chilton (2018) aggregate information on individual laws into a *Competition Law Index (CLI)* that measures the overall stringency of a country's laws restricting anticompetitive behaviors by firms in each year. The *CLI* is composed of four subcomponents. First, *Anticompetitive Agreements* aggregates information on the degree to which laws limit firms from forming horizontal cartels or colluding through vertical agreements. For example, the *Anticompetitive Agreements* subcomponent includes data on laws prohibiting firms from colluding to (1) set market prices for products, (2) divide or allocate the market along geographic, demographic, price, or other characteristics, (3) limit product supply, (4) limit bids above specific prices, (5) not to sell/buy products to/from specific companies, (6) determine the price at which retailers sell products to ultimate consumers, (7) condition contracts on buying other products not directly connected to the product that is the subject of the contract, and (8)

undertake coercive or other practices that limit access to the market or eliminate competitors from the market.

The second component of the *CLI* aggregates information on laws limiting firms from abusing their dominant positions. These *Abuse of Dominance* laws include general prohibitions of abuses of power and narrower provisions that limit specific price and non-price abuses. For example, some laws prohibit dominant firms from (1) setting different prices for different customers for the same products, (2) setting unfair prices by taking advantage of its dominant positions, (3) setting extremely low prices to eliminate competitors, (4) offering discounts to incentivize consumers or downstream companies to trade exclusively with the firm, (5) setting prices at which retailers will ultimately sell to consumers, (6) limiting the supply of products to particular customers, and (7) conditioning sales of one product on the sales unrelated products.

Third, *Merger Control* aggregates information on the extent to which competition laws regulate mergers and acquisitions. It includes data on each country's laws concerning (1) pre-merger notification and approval requirements, (2) authority to restrict mergers for competition and other public interest reasons, and (3) the permissible arguments by firms for mergers and acquisitions that restrict competition.

The fourth component of the *CLI* is *Authority*. It aggregates information on laws concerning (1) which parties have legal standing to bring lawsuits against firms alleged to have violated competition laws, (2) the remedies that authorities can impose for violations of competition laws, and (3) the industries and enterprise types covered by or exempted from the scope of competition laws.

2.3. *Investor protection laws*

We use the *Anti-Director Rights* index to gauge the strength of a country's investor protection laws. The *Anti-Director Rights* index was initially developed in La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998) and then revised by Djankov et al. (2008). We use the

Djankov et al. (2008) version, based on the commercial laws in each country as of 2003. The researchers designed the index to gauge the legal protection of minority shareholders.

Specifically, the *Anti-Director Rights* index is composed of six components. First, *Vote by Mail* equals one if the law mandates that shareholders are entitled to vote by mail on the items on the agenda through a proxy form or postal ballot. The legal rights of voting by mail enable shareholders to cast informed votes and oppose management-initiated proposals. Second, *Shares not Deposited* equals one if the law prohibits companies from requiring shareholders to deposit their shares before the shareholder meeting. The requirement of depositing shares imposes a cost on shareholders because they must either obtain a certificate of ownership or are unable to sell their shares, thereby increasing obstacles to the actual exercise of the voting right. Third, *Cumulative Voting* equals one if the law allows minority shareholders (owning 10% or less of the capital stock) to cast all their votes for a single candidate for the board of directors or to vote proportionately to the number of votes they own. Cumulative voting strengthens the minority shareholder rights as it empowers minority shareholders to influence the board of directors and limits the power of controlling shareholders to dominate the board. The fourth component, *Oppressed Minority*, measures the extent to which minority shareholders can challenge actions that benefit controlling shareholders and damage the company by either rescinding relevant transactions or seeking damages suffered by the company. In particular, *Oppressed Minority* equals one if minority shareholders can challenge a resolution of both the shareholders and the board if it is unfair, prejudicial, oppressive, or abusive. It equals 0.5 if shareholders can challenge either a resolution of the shareholders or of the board if it is unfair, prejudicial, or oppressive. It equals zero otherwise. Fifth, *Pre-Emptive Rights* equals one if the law granted existing shareholders the first opportunity to subscribe to new stock issuances and zero otherwise. Sixth, *Capital to Call a Meeting* equals one if the law mandates that the minimum percentage of shares that entitle a single shareholder to call a special meeting is less than or equal to 10% and zero otherwise. In this way, the *Anti-Director Rights* index ranges from 0 to 6, with higher values

indicating stronger rights granted by the law to protect minority shareholders from being expropriated by managers or controlling shareholders.

2.4. Other country traits

The analyses below control for several time-varying country characteristics potentially associated with firm value. To control for economic development, we use *GDP per capita*, which equals the natural log of gross domestic product per capita. To measure financial development, we use *Stock Market Capitalization/GDP* and *Private Credit/GDP*. *Stock Market Capitalization/GDP* is the ratio of stock market capitalization to GDP. *Private Credit/GDP* is the amount of credit banks provide to the private sector as a proportion of GDP. We also condition on the *Economic Freedom* index. This index measures the protection of private property rights, government integrity, the size of the government, the extent to which regulations impede efficient business operations, government interventions in labor markets, taxes, government size, barriers to international trade, constraints on global capital flows and the operation of domestic financial institutions (Miller, Kim, and Roberts 2020).² Furthermore, several countries changed their tax treatment of shareholder income. These tax changes could shape valuations (e.g., Hail et al., 2015) and be correlated with competition law reforms. We control for this possibility by conditioning on two measures. *Dividend tax* equals the annual maximum statutory dividend tax rate. *Capital gains tax* equals the annual maximum statutory capital gains tax rate. We create

² The Heritage Foundation developed the *Economic Freedom* index from the following ten components (1) *Property Rights* measures the degree of protecting private property via legal system and government enforcement. (2) *Government Integrity* is a measure of government corruption and transparency. (3) *Tax Burden* measures the marginal tax rates on both individual income and corporate profits. (4) *Government Spending* measures the overall expenditure burden of government, including direct spending for maintaining government and transfer payment in all kinds. (5) *Business Freedom* measures the degree to which regulatory and infrastructure environments hinder efficient business operations, such as the ease of starting, operating, and closing a business. (6) *Labor Freedom* measures the extent to which a country's legal and regulatory framework protects the labor market, such as minimum wages and restrictions on hiring, working hours, and layoffs. (7) *Monetary Freedom* measures the extent to which government activities distort prices, along with the overall inflations. (8) *Trade Freedom* measures tariff and non-tariff barriers on imports and exports of goods and services. (9) *Investment Freedom* measures the constraints on the flow of investment capital, such as capital controls, foreign exchange controls, and national treatment of foreign investment. (10) *Financial Freedom* measures banking efficiency and the extent to which the financial sector is independent of government intervention.

these variables using data from the International Bureau of Fiscal Documentation and the Organization for Economic Cooperation and Development tax database

2.5. *Other firm traits*

We account for several time-varying firm characteristics in the main regressions. *Size* equals the natural log of the book value of total assets (denominated in U.S. dollars) of the firm. *Leverage* equals the ratio of long-term debt to the book value of total assets. *ROA* is the ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) to the book value of total assets. *Age* equals the natural log of one plus the number of years since a firm's founding. If information on the year of a firm's founding is missing, we use the year of incorporation.

2.6. *Sample construction*

We begin with all firms in the Thomson Reuters Worldscope database across all countries covered by the Bradford and Chilton (2018) *Competition Law Index* dataset. The sample starts in 1990 because that is the beginning of Worldscope's comprehensive firm-level data. Our sample ends in 2010 because this is the last year when Bradford and Chilton (2018) provide data on the CLI. We exclude firms with negative sales or negative cash holdings and those in regulated industries, which include utilities (standard industrial classification codes (SIC) between 4900 and 4999) and financial firms (SIC between 6000 and 6999). Following existing cross-country, cross-firm research that seeks to make firms more comparable (e.g., Doidge, Karolyi, and Stulz, 2004), we exclude firms with a book value of total assets less than \$100 million. We also require that firms have available information on all key variables (described below). We winsorize firm-level financial variables at the 1% and 99% of the distribution. After implementing these sample selection criteria, our primary sample includes 197,191 firm-year observations involving 22,399 firms in 93 countries. Our primary sample

represents approximately 95% of the total global market capitalization.³ Table 1 provides the summary statistics on key firm-level and country characteristics. The primary dependent variable in our analyses is *Tobin's Q*. It has a mean of 1.51 and a median of 1.21, suggesting that *Tobin's Q* in our sample does not have a skewed distribution.

3. Competition laws and corporate valuations

This section examines the relationship between competition laws and corporate valuations. Specifically, this section (1) uses linear, ordinary least squares (OLS) regressions to assess the association between the *Competition Law Index* and Tobin's Q and shows a positive connection between the stringency of the antitrust laws and firm value, (2) shows that increases in the *Competition Law Index* are associated with reductions in industrial concentration, and (3) demonstrates that changes in corporate valuations do not predict subsequent changes in the *Competition Law Index*. The next section employs additional strategies to (a) better identify the impact of competition laws on valuations and (b) examine how competition and corporate governance interact to shape corporate valuations.

3.1. Baseline specification

We employ the following regression specification to assess the relationship between a country's competition laws and corporate valuations:

$$Tobin's\ Q_{i,c,t} = \alpha_0 + \beta \times Competition\ Law\ Index_{c,t-1} + \gamma \mathbf{X}'_{i,c,t-1} + \alpha_i + \alpha_{j,t} + \varepsilon_{i,c,t}, \quad (1)$$

The dependent variable is *Tobin's Q*_{*i,c,t*} of firm *i* in country *c* in year *t*. The primary explanatory variable is the competition law index for country *c* in year *t-1*: *Competition Law Index*_{*c,t-1*}. It measures the stringency of competition laws and gauges the regulatory risks facing firms

³ We compute the total global market capitalization by aggregating market capitalization of all non-utility, non-financial firms covered in the Worldscope database in 2010.

engaging in anticompetitive activities. $X'_{i,c,t-1}$ includes four time-varying firm traits (*Size*, *Age*, *Leverage*, and *ROA*) for each firm i in country c in year $t-1$ and *GDP Per Capita* of country c in year $t-1$. We condition on these traits to isolate the independent relationship between competition laws and corporate valuations. We control for additional characteristics in robustness tests described below. Equation (1) also includes firm (α_i) fixed effects to condition out time-invariant firm characteristics and industry (j) (three-digit SIC) by year ($\alpha_{j,t}$) fixed effects to control for time-varying industry traits. In the next section, we employ additional strategies for identifying competition laws' impact on valuations and exploring how that relationship varies by corporate governance systems. We estimate Equation (1) using OLS with standard errors clustered at the country level.

3.2. Baseline results

We find that the *Competition Law Index* is positively and significantly associated with *Tobin's Q* across several regression specifications. As shown in Table 2, the positive connection between the stringency of competition laws and corporate valuations holds when conditioning on firm and year fixed effects (columns 1-2) or firm and industry-year fixed effects (columns 3-6). The results are robust to including or excluding time-varying firm traits (*Size*, *Age*, *Leverage*, and *ROA*) and an indicator of economic development (*GDP Per Capita*). The results also hold when excluding the U.S. (columns 5 and 6). Furthermore, the coefficient estimates are similar in magnitude across the different specifications.

The estimated coefficients imply an economically meaningful association between antitrust laws and firm values. We use the coefficient estimates from the specification in column 4, containing the complete set of control variables to illustrate the economic magnitudes. The estimates imply that a one-standard-deviation increase in the *Competition Law Index* (0.27) leads to a rise of 0.12 ($= 0.27 * 0.448$) in *Tobin's Q*. This rise is equivalent to approximately 13% of the sample standard deviation of *Tobin's Q* (0.94) and 8% of the sample mean of *Tobin's Q* (1.51).

3.3. Controlling for additional country characteristics

An omitted, time-varying country characteristic that correlates with competition laws and corporate valuations could bias these results. For example, changes in competition laws might be associated with changes in other national regulations and policies that shape financial systems, institutional and regulatory quality, and economic and business freedom. We add additional country traits into the baseline specification to mitigate this omitted variable concern and test whether the baseline results continue to hold.

Results presented in Table 3 show that the positive and significant relationship between *Tobin's Q* and the *Competition Law Index* holds when sequentially including an array of other country characteristics, namely (a) financial development (*Stock Market Capitalization/GDP* and *Private Credit/GDP*), (b) economic freedom (*Economic Freedom*), and (c) taxes on capital gains and dividend (*Capital Gains Tax* and *Dividend Tax*). The results also hold when simultaneously including all these characteristics, as shown in column (6).⁴

3.4. Does reverse causality explain the results?

The results reported in Tables 2 and 3 are consistent with the view that making antitrust laws more stringent boosts valuations. However, there may be concerns that reverse causality drives the relationship between corporate valuations and antitrust laws. To address this concern, we examine whether changes in corporate valuation predict changes in competition laws.

Specifically, we first compute the average value of *Tobin's Q* across firms in a country each year (*Country Tobin's Q*). We then assess whether *Country Tobin's Q* at $t-1$ predicts the *Competition Law Index* in period t (and period $t+1$) using the following model specification:

⁴ In unreported robustness tests, we also implement the Brodeur, Cook, and Heyes (2020) p-hacking test to further evaluate the robustness of the relationship between *Tobin's Q* and the *Competition Law Index* to changes in the conditioning information set (e.g., Levine and Renelt, 1992). Specifically, we examine the regression results in Table 3 using all combinations of the explanatory variables. We confirm a strong positive relationship between *Tobin's Q* and the *Competition Law Index* across the specifications, suggesting a robust, independent connection between competition and valuations.

$$\text{Competition Law Index}_{c,t} = \alpha_0 + \beta \times \text{Country Tobin's } Q_{c,t-1} + \gamma \text{GDP per Capita}_{c,t-1} + \dots + \delta_c + \delta_t + \varepsilon_{c,t}. \quad (2)$$

We include country (δ_c) and year (δ_t) fixed effects to account for unobservable time-invariant country characteristics and time effects. We estimate Equation (2) using OLS with standard errors clustered at the country level.

We find that corporate valuations do not predict changes in competition laws. As shown in Table 4, *Tobin's Q Country* in $t-1$ enters insignificantly in all columns. This result holds when (a) measuring a country's competition laws in period t (columns 1-2) or $t+1$ (columns 3-4), and (b) including or excluding the degree of economic development (*GDP per Capita*). There is no evidence of reverse causality running from changes in corporation valuations to changes in national antitrust laws.

3.5. Do competition laws influence competition?

One interpretation of the results is that increasing the stringency of competition laws boosts corporate valuations by intensifying product market competition. However, this interpretation presumes that increases in the *Competition Law Index* intensify competition among firms.

In this subsection, we examine whether an intensification of competition law stringency, i.e., increases in the *Competition Law Index*, boosts product market competition. We use the Herfindahl-Hirschman index of industry concentration as a proxy for (less) product market competition. We then estimate the following regression at the country-industry level:

$$HHI_{c,j,t} = \alpha_0 + \beta \times \text{Competition Law Index}_{c,t-1} + \gamma \mathbf{X}'_{c,t-1} + \delta_{c,j} + \delta_{(j),t} + \varepsilon_{c,t}. \quad (3)$$

The dependent variable, $HHI_{c,j,t}$ is the Herfindahl-Hirschman index of industry j in country c in year t . Following Giroud and Mueller (2010), we compute *HHI* based on firms' sales or total

assets. We control for country-by-industry ($\delta_{c,j}$) fixed effects in all specifications. We include either year (δ_t) or industry-by-year ($\delta_{j,t}$) fixed effects in different specifications. We estimate Equation (3) using OLS with standard errors clustered at the country level.

We discover that increasing the stringency of competition laws is associated with material reductions in product market concentration. As reported in Table 5, the *Competition Law Index* enters negatively and significantly in all regressions. These findings indicate that industries, on average, become less concentrated after countries make their competition laws more stringent.

4. Evaluating the mechanisms linking competition laws and corporate valuations

The results thus far suggest that making competition laws more stringent is associated with subsequent increases in competition and corporate valuations. These findings are consistent with the agency explanation: competition triggers improvements in corporate governance that mitigate agency problems within firms, and the reduction in agency frictions boosts corporate valuations. However, we have not yet demonstrated that intensifying competition laws boosts valuations by reducing agency frictions. The next two sections assess the mechanisms underlying the agency explanation.

In particular, this section examines whether the association between competition laws and corporate valuations varies across countries, firms, and industries in ways consistent with the view that competition laws increase corporate valuations by spurring competition and reducing agency frictions. We begin by evaluating a broad corollary of the agency view: intensifying competition will improve governance more when there are larger pre-existing agency frictions. Intuitively, competition will not materially improve governance if other corporate governance mechanisms already work effectively. This section assesses this broad corollary using national investor protection laws as a proxy for pre-existing agency frictions. Next, this section evaluates an additional implication of the agency view. We test whether the impact of making competition

laws more stringent on valuations is smaller among firms operating in industries that were already highly competitive before the change in competition laws. Finally, we examine the relationship between competition laws and firm-specific measures of operational efficiency. This provides direct evidence on the connection between reforms of antitrust laws and how firms alter their behaviors.

4.1. Differentiating by national investor protection laws

The agency explanation suggests that intensifying competition will trigger more substantial increases in corporate valuations in economies with greater agency frictions. We first examine this prediction by using insights from the law and finance literature. As reviewed by La Porta, Lopez-de-Silanes, and Shleifer (2008), research shows that firms operating in countries with weaker shareholder protection laws tend to have more severe agency problems than firms in countries with stronger investor protection laws (e.g., La Porta et al. 2002). Therefore, the agency explanation predicts that the value-enhancing effects of stronger antitrust laws will be larger among firms in countries with weaker shareholder protection laws and correspondingly smaller among firms in countries with stronger shareholder protection laws.

We evaluate whether the competition-valuation connection is weaker in countries with stronger shareholder protection laws. To measure shareholder protection laws, we use the *Anti-Director Rights* index originally developed by La Porta et al. (1997, 1998) and later revised in Djankov et al. (2008). As described above, larger values of the *Anti-Director Rights* index signify stronger shareholder protection laws. We then modify Equation (1) by including an interaction term: *Competition Law Index* * *Anti-Director Rights*. The agency explanation predicts a negative coefficient estimate on the interaction term.

The Table 6 results suggest that the value-enhancing effects of more stringent competition laws are smaller among firms in countries with stronger shareholder protection laws. As shown in column 1, the linear term, *Competition Law Index*, enters positively and significantly. The interaction term, *Competition Law Index* * *Anti-Director Rights*, enters

negatively and significantly, suggesting that the value-enhancing effects of competition decrease with the strength of investor protection.⁵ We find similar results when partitioning the sample into high- and low-*Anti-Director Rights* countries based on whether the *Anti-Director Rights* index of a country falls above or below the sample median. As shown in columns 2 and 3, the positive association between *Competition Law Index* and firm value is statistically significant for low-*Anti-Director Rights* countries but insignificant in high-*Anti-Director Rights* countries. This finding is consistent with the view that intensifying competition is particularly beneficial to firm value in economies that give weaker legal protections of shareholders, i.e., in economies that provide minority shareholders limited rights in redressing agency issues.⁶

4.2. Differentiating by industry market structure

We next examine a different corollary of the view that competition boosts valuations by reducing agency frictions. Suppose that making competition laws more stringent intensifies competition, and the resultant competition spurs improvements in corporate governance that reduce managerial agency problems and increase valuations. Under these conditions, the impact of any given change in competition laws on corporate valuations should be smaller if the industry is already highly competitive. For example, if firms are operating in a perfectly competitive market, intensifying competition laws will not impact valuations through the competition-agency channel.

⁵ The *Anti-Director Rights* index is time-invariant, so the firm-fixed effects subsume the linear term of this index.

⁶ As a robustness test, we use an additional indicator of the strength of shareholder protection. La Porta et al. (1998, 1999) show that common law countries tend to have stronger investor protection laws than civil law countries. Thus, we use the indicator variable, *Common Law*, which equals one if a country's legal origin is the English common law and zero if a country's legal origin falls within the civil tradition (i.e., French, German, or Scandinavian). We test whether the relationship between corporate valuations and competition laws is weaker among common law countries. Appendix Table A1 shows that the interaction term, *Competition Law Index* * *Common Law*, enters negatively and significantly. To the extent that common-law countries incorporate legal provisions that are more protective of shareholder rights than civil-law countries, these results are consistent with the view that competition boosts firm value by enhancing corporate governance.

To test this prediction, we measure industry market structure using the *HHI*. We set *HHI* equal to the Herfindahl–Hirschman Index of concentration, which equals the sum of squared market shares of each firm’s total sales in a country-industry-year. We then define *High HHI* as a dummy variable that equals one if a firm belongs to an industry with an above-sample-median *HHI* and zero otherwise. To mitigate the concern that changes in competition laws directly change market structure, we use the value of *HHI* for each country-industry measured in the initial year of the sample. We then include the interaction term, *Competition Law Index * High HHI*, in the baseline regression. The agency explanation suggests that the interaction term will enter with a positive coefficient.

As shown in Table 7, the regression estimates are consistent with the agency view. The positive relationship between competition law stringency and firm value is more pronounced in more concentrated industries. Specifically, the *Competition Law Index * High HHI* interaction term enters positively and significantly at the 10 percent level in column 1.

We extend these analyses by combining predictions concerning investor protection laws and industry concentration. Specifically, the agency explanation predicts that the value-enhancing effects of competition will be greater among firms in (1) economies with greater pre-existing agency frictions (e.g., in economies where *Low Anti-Director Rights* equals one) and (2) less competitive industries (e.g., in industries where *High HHI* equals one). To examine these predictions simultaneously, we implement two strategies. First, we include into the baseline model (a) the two interaction terms (*Competition Law Index*Low Anti-Director Rights* and *Competition Law Index*High HHI*) and (b) the triple interaction term (*Competition Law Index * Low Anti-Director Rights*High HHI*). Second, we split the sample between Low and High *Anti-Director Rights* countries and run the regressions while including the *Competition Law Index*High HHI* interaction term.

As shown in Table 7, the results are consistent with the prediction that intensifying competition laws will disproportionately boost valuations among firms that are both (a) in economies with greater pre-existing agency frictions and (b) in less competitive industries.

Specifically, we find that both *Competition Law Index* * *Low Anti-Director Rights* and *Competition Law Index* * *Low Anti-Director Rights* * *High HHI* enter positively and significantly. These results suggest that after countries increase the stringency of competition laws, firm valuations increase more in countries with greater agency frictions (as measured by *Low Anti-Director Rights* = 1), and this effect is more pronounced when the firm is operating in a less competitive industry (as measured by *High HHI* = 1). This result holds when using the triple interaction term (column 2) or when splitting the sample, as shown in columns 3 and 4.

4.3. Operating efficiency

We augment our evaluation of the agency view by examining the operational performance of firms. In particular, the agency explanation stresses that intensifying competition boosts corporate values by reducing agency problems and enhancing corporate performance. Thus far, we have shown that the relationship between intensifying competition laws and corporate valuations varies across firms in (a) countries with different investor protection laws and (b) industries with different market concentration levels in ways consistent with the agency explanation.

We now examine the relationship between changes in competition laws and two firm-specific measures of operational efficiency. The first measure, *Selling, General & Administrative Expenses/Sales*, equals operating expenses that do not include expenditures directly related to producing goods or services divided by total sales. These include marketing, advertising, rent, utilities, salaries, and benefits expenses not directly involved in manufacturing goods or providing services. Thus, *Selling, General & Administrative Expenses/Sales* is often used to gauge firms' operating performance and managerial slack. The second measure, *Staff Costs/Sales*, equals wages paid to employees and other labor-related expenses (such as employee benefits, pension expense, profit-sharing expense, insurance, etc.) divided by total sales. When comparing firms within an industry, *Staff Costs/Sales* provides information on a firm's relative operational efficiency.

We then assess whether intensifying competition laws is associated with improvements in these two operational efficiency measures. Specifically, we use *Selling, General & Administrative Expenses/Sales* and *Staff Costs/Sales* as dependent variables and employ the same regression specifications as in Table 6. While *Selling, General & Administrative Expenses/Sales* and *Staff Costs/Sales* are imperfect operational efficiency measures, they provide additional evidence on the agency explanation for why intensifying competition laws is associated with subsequent increases in corporate valuations.

We find a positive connection between the stringency of competition laws and operational efficiency in economies with weak legal protection of shareholder rights. In particular, consider columns 2 and 4 of Table 8, where the dependent variable is *Selling, General & Administrative Expenses/Sales* in column 2 and *Staff Costs/Sales* in column 4. The regression includes the *Competition Law Index*, the interaction term between the *Competition Law Index* and *Anti-Director Rights*, and the set of time-varying firm controls, firm-fixed effects, and industry-year fixed effects discussed above. As shown, the *Competition Law Index* enters negatively and significantly in both regressions, while the interaction terms enter positively and significantly. These findings indicate making competition laws more stringent is associated with future reductions in these cost indicators in economies with weaker shareholder protection laws. The findings are consistent with the view that competition mitigates managerial slack and enhances corporate efficiency.

5. Differentiating by firm-specific corporate governance and opacity characteristics

5.1. Firm-specific corporate governance characteristics

We next evaluate the agency view's prediction that competition boosts valuations more when there are larger pre-existing agency frictions. We use three firm-specific measures of those pre-existing agency frictions. Thus, rather than using a country-level measure, *Anti-Director Rights*, to proxy for pre-existing agency frictions, we now use firm-level indicators. One

disadvantage of using firm-specific corporate governance indicators is data coverage. The sample shrinks to 20% of the primary sample when using these indicators.

We obtain these firm-specific indicators of corporate governance from the Thomson Reuters ASSET4 database. We construct the indicators using the earliest available data from ASSET4. Thus, they are firm-specific and time-invariant. The sample using firm-specific governance indicators covers 38,359 firm-year observations across 50 countries.

First, *Internal Monitoring and Governance* measures the degree to which a company structures its board of directors and executive compensation policies to ameliorate agency frictions.⁷ Thomson Reuters constructs *Internal Monitoring and Governance* by aggregating 34 corporate board and executive compensation traits into a score ranging from 0 to 100. Larger values indicate more effective internal governance mechanisms. Thus, the agency explanation predicts that the positive impact of competition on valuations will be smaller among firms with larger *Internal Monitoring and Governance* values.

Second, *Equal Shareholder Rights* measures whether the corporation treats shareholders equally, rather than limiting the rights of some shareholders. It equals one if the firm satisfies all three of the following criteria and zero otherwise: (a) the company does not have shares with different voting rights, (b) the firm does not have shares with a voting cap or a share ownership limit, and (c) the firm does not require that shareholders hold a minimum number of shares to vote. Using the bylaws and charter of the firm, *Equal Shareholder Rights* gauges the protection

⁷ Thomson Reuters constructs the *Internal Monitoring and Governance* score from 34 individual components. Concerning the board of directors, the score uses indicators capturing board size, board independence, the independence of committees (e.g., audit committee, compensation committee, nomination committee), the tenure of board members, the affiliations of board members on other corporate boards, the skills of board members, board diversity (gender, cultural), re-election policies and succession plans for board members, board attendance rates, and whether the board or board committees have the authority to hire external advisers or consultants without management's approval. Regarding executive compensation policies, the score uses information on whether the company has a performance-based compensation policy for the higher-level executives and board members, whether the company links executive and board compensation to (a) longer-term objectives, i.e., objectives that are more than two years in the future, (b) total shareholder return, and (c) corporate social responsibility, and whether the company has the necessary internal improvement and information tools for the board members to develop appropriate compensation/remuneration to attract and retain key executives.

of small shareholders. The agency explanation suggests that the value-enhancing effects of competition will be smaller for firms that protect shareholders equally.

Third, *Managerial Entrenchment* measures the extent to which a company's corporate governance provisions insulate managers from the disciplinary threat of removal. Greater managerial entrenchment tends to be associated with more severe agency frictions associated with increased shirking, empire-building, and tunneling by managers (e.g., Manne 1965). To construct *Managerial Entrenchment*, we use the summation of six corporate provisions that past research shows facilitate entrenchment (Gompers, Ishii, and Metrick 2003; Bebchuk, Cohen, and Ferrell 2008). Specifically, we add one point to *Managerial Entrenchment* for each of the following entrenchment provisions in the firm's bylaws or charter: (*Poison Pills*, *Blank Checks*, *Supermajority Votes*, *Golden Parachutes*, *Limited Shareholder Rights to Call for Special Meetings*, and *Classified board*). When firm bylaws or charters require a supermajority vote to amend corporate charters, impose limits on shareholders' abilities to call special meetings, or create a classified board structure that limits the number of members up for re-election in any given year, this tends to constrain shareholder power over management. Provisions such as poison pills, blank check preferred stock, and golden parachutes hamper hostile takeovers and protect incumbent managers from market discipline. *Managerial Entrenchment* ranges from zero to six, with higher values indicating greater managerial entrenchment. The agency explanation predicts that the positive impact of competition on valuations will be larger among firms with greater *Managerial Entrenchment*.

As shown in Table 9, the findings are consistent with the agency explanation. The positive association between the *Competition Law Index* and *Tobin's Q* is stronger among firms with weaker governance provisions. The *Competition Law Index* * *Internal Monitoring and Governance* interaction term enters negatively and significantly. This finding indicates that when firms have stronger governance provisions (larger values of *Internal Monitoring and Governance*), the value-enhancing effects of competition are muted. The results are similar for *Equal Shareholder Rights*. For *Managerial Entrenchment*, larger values indicate weaker

governance. Consistent with the agency explanation, we find that the *Competition Law Index* * *Managerial Entrenchment* interaction term enters positively and significantly. This result is consistent with the prediction that the value-enhancing effects of competition are greater when corporate governance is less effective in discipline managers, i.e., with larger values of *Managerial Entrenchment*.

We extend these analyses by examining the individual components of the aggregate *Managerial Entrenchment* index. Rather than studying the *Competition Law Index* * *Managerial Entrenchment* interaction term, we investigate the interaction between the *Competition Law Index* and each of the six entrenchment provisions that compose the *Managerial Entrenchment* index: (a) *Poison Pills*, (b) *Blank Checks*, (c) *Supermajority Votes*, (d) *Golden Parachutes*, (e) *Limited Shareholder Rights to Call for Special Meetings*, and (f) *Classified Board*. Since these entrenchment provisions imply greater agency frictions, the agency view predicts that these interaction terms will enter positively. The results presented in columns (4) – (9) are strongly consistent with this prediction. Five out of the six interaction terms between the *Competition Law Index* and the individual entrenchment provisions enter positively and significantly.

5.2. Differentiating by firm-specific informational opacity

In this subsection, we use measures of firm opacity to proxy for pre-existing agency frictions. Opacity makes it more difficult for shareholders and the board of directors to oversee the actions of managers. As a result, informational asymmetries help managers extract private benefits from firms and obfuscate the negative consequences of such actions. In this way, opacity is indicative of greater agency frictions. Thus, the agency view predicts that the value-enhancing effects of competition will be stronger among more informationally opaque firms.

We use four measures of information opacity to test this prediction. First, *Industrial Tangibility* measures the asset tangibility in each industry. We first compute the median value of the ratio of tangible assets (property, plant, and equipment or (*PPE*)) to total assets for each firm in Worldscope over the ten years from 1990 through 1999 and call it *Tangibility*. We then

calculate the median value of *Tangibility* across firms within each industry and call this value *Industrial Tangibility*. Under the assumption that tangible assets are less informationally opaque than intangible assets, higher values of *Industrial Tangibility* indicate less opacity. Second, *Analyst Coverage* equals the number of analysts following the firm. Assuming that more stock analysts imply smaller informational asymmetries, higher values of *Analyst Coverage* suggest less opacity.

The third and fourth measures of opacity use *Discretionary Accruals*, which is that part of total accruals over which management has discretion. An extensive literature uses *Discretionary Accruals* to proxy for earnings management (e.g., Leuz and Wysocki, 2016). *Total Accruals (TAC)* equals the change in working capital ($=\Delta\text{current assets}-\Delta\text{cash} - (\Delta\text{current liability}-\Delta\text{maturing debt})$) minus depreciation and amortization. We use two models to estimate the discretionary component of *Total Accruals*: the Jones model and the modified Jones model (Jones, 1991; Dechow, Sloan, and Sweeney, 1995). Both regression models attempt to explain total accruals using firm traits (e.g., sales, fixed assets, etc.). They then define the absolute values of the residuals from the regression as *Discretionary Accruals*. Larger values of these *Discretionary Accruals* measures imply greater earnings management and less informative financial statements.

More specifically, the Jones model (Jones 1991) is the following:

$$\frac{TAC_{i,t}}{AT_{i,t-1}} = \alpha_{0,j,t} + \alpha_{j,t} \left(\frac{1}{AT_{i,t-1}} \right) + \beta_{j,t} \left(\frac{\Delta SALE_{i,t}}{AT_{i,t-1}} \right) + \gamma_{j,t} \left(\frac{PPENT_{i,t}}{AT_{i,t-1}} \right) + \varepsilon_{i,t}.$$

The dependent variable is $TAC_{i,t}$, total accruals by firm i in year t , scaled by the total book value of assets at the beginning of a fiscal year ($AT_{i,t-1}$). $\Delta Sale$ is the change of total revenues from $t-1$ to t . $PPENT$ represents the net value of property, plant, and equipment. As indicated, the model scales these explanatory variables by $AT_{i,t-1}$ and includes the inverse of $AT_{i,t-1}$ as a separate explanatory variable. We estimate the model for each country-year group with more than ten observations. Then we use the absolute value of the residual, $\widehat{\varepsilon}_{i,t}$, as *Discretionary Accruals*

(Jones). We set *High Discretionary Accruals (Jones)* equal to one if *Discretionary Accruals (Jones)* falls above the sample median and zero otherwise.

The Modified Jones model (Dechow, Sloan, and Sweeney, 1995) is:

$$\frac{TAC_{i,t}}{AT_{i,t-1}} = \alpha_{0,j,t} + \alpha_{j,t} \left(\frac{1}{AT_{i,t-1}} \right) + \beta_{j,t} \left(\frac{\Delta SALE_{i,t} - \Delta RECT_{i,t}}{AT_{i,t-1}} \right) + \gamma_{j,t} \left(\frac{PPENT_{i,t}}{AT_{i,t-1}} \right) + \varepsilon_{i,t},$$

where $\Delta RECT$ represents the change of account receivables. We then follow similar procedures and compute *Discretionary Accruals (Modified Jones)*. We set *High Discretionary Accruals (Modified Jones)* equal to one if *Discretionary Accruals (Modified Jones)* falls above the sample median and zero otherwise.

We follow the same methodology used above to test the prediction that *Tobin's Q* will increase more following an increase in the *Competition Law Index* among more informationally opaque firms. That is, we re-estimate Equation (1) while sequentially including four interaction terms: the interactions between the *Competition Law Index* and each of the four opacity measures.

The findings confirm the predictions of the agency explanation. As shown in Table 10, the positive association between the *Competition Law Index* and *Tobin's Q* is more pronounced for (1) firms in industries with lower *Industrial Tangibility*, (2) firms covered by fewer stock analysts (lower *Analyst Coverage*), and (3) firms with more earnings management as measured by either *High Discretionary Accruals (Jones)* or *High Discretionary Accruals (Modified Jones)*. These results are consistent with the prediction that the value-enhancing effects of competition are stronger when informational asymmetries are larger.

6. Conclusion

We assess how changes in a country's competition laws would affect corporate valuations in that country. Exploiting a large panel dataset containing (a) detailed information on laws regulating competition among firms in more than 90 countries over the period from 1990

through 2010 and (b) market-based measures of firm value for more than 22,000 firms, we find a positive association between the *Competition Law Index* and firm value. The results hold when including firm and industry-by-time fixed effects, along with an array of time-varying country traits and firm characteristics.

We also evaluate underlying mechanisms linking antitrust laws and firm value. We find that making competition laws more stringent boosts firm value more (a) for firms in economies with weaker investor protection laws, (b) for firms that have less effective governance mechanisms in reducing agency frictions, and (c) for more opaque firms. Furthermore, the value-enhancing effects of more stringent competition laws are smaller among firms operating in more competitive industries. Finally, we discover that operational efficiency increases after competition laws become more stringent in economies with more severe agency problems. These results are consistent with the agency view that more stringent competition laws intensify competition, and the resultant boost in competition reduces managerial agency problems and increases valuations.

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Table 1 Summary statistics

This table reports the summary statistics of key variables used in our analysis. For each variable, *N*, *Mean*, *Sd*, *P10*, *P50*, and *P90* represent, respectively, the number of non-missing observations, the mean value across observations, the standard deviation across observations, and the value of the variable at the 10th, 50th, and 90th percentile of the distribution of the variable. Statistics include both firm-level variables and country-level during 1990-2010.

Variable	N	Mean	Sd	P10	P50	P90
<i>Competition Laws Stringency</i>						
Competition Law Index	1277	0.555	0.271	0	0.644	0.839
<i>Other Country-Level Variables</i>						
Anti-Director Rights	1089	3.48	1.1	2	3.5	5
GDP Per Capita	1277	9.38	1.32	7.28	9.59	10.8
Stock Market Capitalization/GDP	909	71.8	87.8	14.2	48.9	146
Private Credit/GDP	1089	63.7	44.8	16.2	52.8	127
Economic Freedom	1051	65.1	9.58	53.4	64.7	77.9
Capital Gains Tax	821	14.6	15.7	0	12.5	40
Dividend Tax	821	20.9	15.8	0	22	41.9
<i>Firm-Level Variables</i>						
Tobin's Q	197191	1.51	0.943	0.797	1.21	2.53
Selling, General & Administrative Expenses/Sales	158020	0.193	0.168	0.049	0.151	0.377
Labor and Related Expenses/Sales	71396	0.19	0.148	0.033	0.160	0.372
Size	197191	20.1	1.40	18.6	19.8	22.1
Age	197191	3.21	1.05	1.79	3.37	4.47
Leverage	197191	0.158	0.162	0.000	0.117	0.378
ROA	197191	0.107	0.107	0.014	0.106	0.222
Internal Monitoring and Governance	38359	46.59	28.26	8.52	45.31	86.71
Equal Shareholder Rights	38359	0.833	0.373	0	1	1
Managerial Entrenchment	38359	2.463	1.64	0	2	5
Industrial Tangibility	197191	0.325	0.163	0.141	0.295	0.561
Analyst Coverage	197191	4.314	5.465	1	2	11
Discretionary Accruals (Jones)	193565	0.087	0.132	0.008	0.046	0.190
Discretionary Accruals (Modified Jones)	193559	0.087	0.130	0.008	0.046	0.195

Table 2 Competition laws and firm value, baseline

This table reports the association between competition laws and firm value. The dependent variable, *Tobin's Q*, equals the book value of total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets. The key explanatory variable, *Competition Law Index*, measures the overall stringency of competition laws in a country in a year. Firm-level controls include *Firm Size*, *Leverage*, *Profitability* and *Age*. Country controls include *GDP per capita*. We include firm and year fixed effects in columns 1-2 and firm and industry-by-year fixed effects in columns 3-6. The t-statistics calculated with robust standard errors clustered at the country level are reported in parentheses. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	Tobin's Q					
	(1)	(2)	(3)	(4)	(5)	(6)
Competition Law Index	0.674** (2.610)	0.477** (2.157)	0.595** (2.327)	0.448** (2.038)	0.606** (2.408)	0.497** (2.357)
Size		-0.290*** (-7.518)		-0.300*** (-8.410)		-0.254*** (-13.34)
Leverage		0.0176 (0.438)		0.0541 (1.623)		0.0605 (1.113)
ROA		1.019*** (14.13)		0.915*** (12.30)		0.991*** (10.78)
Age		-0.104*** (-4.396)		-0.0661*** (-2.959)		-0.0921*** (-3.723)
GDP Per Capita		0.980*** (5.268)		0.882*** (6.259)		0.797*** (7.127)
Firm FE	Y	Y	Y	Y	Y	Y
Year FE	Y	Y	N	N	N	N
Industry-Year FE	N	N	Y	Y	Y	Y
Observations	220,974	197,913	220,259	197,191	171,430	151,265
R-squared	0.635	0.673	0.673	0.706	0.669	0.703
# of countries	99	93	99	93	98	92

Table 3 Competition laws and firm value, robustness

This table shows the association between competition law index and firm value, while conditioning on other country-level factors, namely *Stock Market Capitalization/GDP*, *Private Credit/GDP*, *Capital Gains Tax*, *Dividend Tax*, and *Economic Freedom*. The dependent variable, *Tobin's Q*, equals the book value of total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets. The key explanatory variable, *Competition Law Index*, measures the overall stringency of competition laws in a country in a year. Firm-level controls include *Firm Size*, *Leverage*, *Profitability* and *Age*. Country controls include *GDP per capita*. We include firm and industry-by-year fixed effects in all columns. The t-statistics calculated with robust standard errors clustered at the country level are reported in parentheses. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	Tobin's Q					
	(1)	(2)	(3)	(4)	(5)	(6)
Competition Law Index	0.471** (2.353)	0.481** (2.058)	0.491** (2.328)	0.481** (2.151)	0.480** (2.167)	0.449** (2.233)
Stock Market Capitalization/GDP	0.0003 (1.065)					0.00002 (0.168)
Private Credit/GDP		0.0005 (1.543)				-0.0004 (-0.951)
Economic Freedom			0.00179 (0.457)			0.00146 (0.338)
Capital Gains Tax				0.0001 (0.0942)		0.00176 (1.605)
Dividend Tax					-0.0003 (-0.184)	-0.000808 (-0.475)
Size	-0.302*** (-7.648)	-0.306*** (-8.570)	-0.331*** (-7.700)	-0.300*** (-8.064)	-0.300*** (-8.025)	-0.336*** (-6.737)
Leverage	0.0630** (2.140)	0.0598* (1.874)	0.0642** (2.051)	0.0563 (1.661)	0.0566 (1.671)	0.0779*** (2.998)
ROA	0.849*** (12.98)	0.862*** (12.72)	0.757*** (9.720)	0.904*** (12.00)	0.904*** (12.01)	0.645*** (10.18)
Age	-0.0614*** (-2.733)	-0.0588*** (-2.706)	-0.0673** (-2.335)	-0.0574*** (-2.750)	-0.0570** (-2.689)	-0.0395 (-1.345)
GDP Per Capita	1.046*** (4.013)	0.858*** (7.151)	0.912*** (7.588)	0.880*** (5.643)	0.885*** (5.500)	1.277*** (5.278)
Firm FE	Y	Y	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y	Y	Y
Observations	185,236	183,594	171,324	189,112	189,112	148,960
R-squared	0.717	0.714	0.724	0.709	0.709	0.741
# of countries	73	90	92	41	41	41

Table 4 Pre-existing firm value and competition laws

This table reports the connection between pre-existing measures of firm value and the competition law index. The dependent variable, *Competition Law Index*, measures the overall stringency of a country's competition laws, measured in year t (columns 1-2) or $t+1$ (columns 3-4). The explanatory variable, *Country Tobin's Q*, is the one-year-lagged measure of firm value (*Tobin's Q*), averaged across each country in a year. Other variables are defined the same as before. The t-statistics calculated with robust standard errors clustered at the country level are reported in parentheses. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	Competition Law Index[t]		Competition Law Index[$t+1$]	
	(1)	(2)	(3)	(4)
Country Tobin's Q [$t-1$]	-0.019 (-1.107)	-0.018 (-1.059)	-0.010 (-0.598)	-0.010 (-0.597)
GDP per Capita [$t-1$]		-0.095 (-1.072)		-0.001 (-0.016)
Country FE	Y	Y	Y	Y
Year FE	Y	Y	Y	Y
Observations	1,179	1,179	1,179	1,179
Adjusted R-squared	0.806	0.807	0.826	0.826
# countries	90	90	90	90

Table 5 Competition laws and product market competition

This table reports the connection between competition laws in a country and market structure. The dependent variable is the Herfindahl-Hirschman index (HHI) of each country-industry in a year based on sales (columns 1-2) or total assets (columns 3-4). Other variables are defined the same as before. The t-statistics calculated with robust standard errors clustered at the country level are reported in parentheses. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	HHI(sales)		HHI(total assets)	
	(1)	(2)	(3)	(4)
Competition Law Index	-0.0866** (-2.238)	-0.0888** (-2.343)	-0.0987** (-2.373)	-0.100** (-2.450)
GDP Per Capita	-0.367*** (-5.758)	-0.364*** (-5.797)	-0.371*** (-5.638)	-0.367*** (-5.664)
Country-Industry FE	Y	Y	Y	Y
Year FE	Y	N	Y	N
Industry-Year FE	N	Y	N	Y
Observations	110,534	109,920	110,405	109,792
R-squared	0.762	0.787	0.788	0.811
# of countries	119	119	119	119

Table 6 Competition laws and firm value, differentiate by investor protection

This table presents the heterogeneous effects between competition law index and firm value, across countries with different degree of investor protection. We use the *Anti-Director Rights* index as proxies for the extent to which a country's legal framework protects investors from being expropriated by insiders. The *Anti-Director Rights* index (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1997, 1998; Djankov et al. 2008) is an aggregate measure of how strongly the legal system protects minority shareholders against managers or controlling shareholders in the corporate decision-making process. *High* (or *Low*) *Anti-Director Rights* is an indicator that equals one if the *Anti-Director Rights* index of a country falls above (or below) the sample median value. *Tobin's Q* equals the book value of total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets. *Competition Law Index*, measures the overall stringency of competition laws in a country in a year. Firm-level controls include *Firm Size*, *Leverage*, *Profitability* and *Age*. Country controls include *GDP per capita*. The t-statistics calculated with robust standard errors clustered at the country level are reported in parentheses. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	Tobin's Q		
		Low Anti-Director Right	High Anti-Director Right
	(1)	(2)	(3)
Competition Law Index	1.163*** (9.328)	0.713*** (3.987)	0.0974 (0.663)
Competition Law Index*Anti-Director Rights	-0.248*** (-6.215)		
Size	-0.301*** (-8.250)	-0.378*** (-10.48)	-0.241*** (-11.57)
Leverage	0.0562* (1.699)	0.0368 (1.299)	0.127** (2.238)
ROA	0.909*** (12.44)	0.883*** (13.81)	0.913*** (7.152)
Age	-0.0521*** (-2.881)	-0.0657*** (-2.859)	-0.0536* (-1.827)
GDP Per Capita	0.700*** (3.796)	0.712*** (9.114)	0.775*** (3.560)
Firm FE	Y	Y	Y
Industry-Year FE	Y	Y	Y
Observations	195,570	90,663	103,863
R-squared	0.708	0.717	0.710
# of countries	66	33	33

Table 7 Competition laws and firm value, differentiate by pre-existing market structure

This table presents the heterogeneous effects between competition law index and firm value, across industries with different pre-existing market structure. *High HHI* is a dummy variable equal to one if a firm belongs to an industry with an above-sample-median Herfindahl–Hirschman Index based on sales, and zero otherwise. *Low Anti-Director Rights* is an indicator that equals one if the *Anti-Director Rights* index of a country falls below the sample median value, and zero otherwise. *Tobin's Q* equals the book value of total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets. *Competition Law Index* measures the overall stringency of competition laws in a country in a year. Firm-level controls include *Firm Size*, *Leverage*, *Profitability* and *Age*. Country controls include *GDP per capita*. The t-statistics calculated with robust standard errors clustered at the country level are reported in parentheses. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	Tobin's Q			
			Low Anti-Director Rights	High Anti-Director Rights
	(1)	(2)	(3)	(4)
Competition Law Index	0.352* (1.897)	0.0986 (0.635)	0.556** (2.729)	0.173 (1.053)
Competition Law Index*High HHI	0.183* (1.745)	-0.151 (-1.139)	0.266** (2.243)	-0.172 (-1.204)
Competition Law Index* Low Anti-Director Rights		0.558*** (2.794)		
Competition Law Index* Low Anti-Director Rights *High HHI		0.394** (2.378)		
Firm & Country controls	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
Observations	197,191	195,570	90,663	103,863
R-squared	0.706	0.708	0.717	0.710
# of countries	93	66	33	33

Table 8 Competition laws and operational efficiency, differentiate by investor protection

This table presents the heterogeneous effects between competition law index and operating efficiency, across countries with different degree of investor protection. We measure efficiency using *Selling, General & Administrative Expenses/Sales* (columns 1 and 2) and *Labor and Related Expenses/Sales* (columns 3 and 4). The *Anti-Director Rights* index (La Porta, Lopez-de-Silanes, Shleifer, and Vishny 1997, 1998; Djankov et al. 2008) is an aggregate measure of how strongly the legal system protects minority shareholders against managers or controlling shareholders in the corporate decision-making process. *Competition Law Index* measures the overall stringency of competition laws in a country in a year. Firm-level controls include *Firm Size*, *Leverage*, *Profitability* and *Age*. Country controls include *GDP per capita*. The t-statistics calculated with robust standard errors clustered at the country level are reported in parentheses. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	Selling, General & Administrative Expenses/Sales		Labor and Related Expenses/Sales	
	(1)	(2)	(3)	(4)
Competition Law Index	-0.0100 (-1.569)	-0.0215*** (-2.714)	-0.00818 (-0.994)	-0.0384*** (-4.828)
Competition Law Index*Anti-Director Rights		0.00491* (1.783)		0.00924*** (3.534)
Firm & Country controls	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
Observations	157,374	155,972	69,663	68,461
R-squared	0.816	0.816	0.896	0.896
# of countries	92	66	89	64

Table 9 Competition laws and firm value, differentiate by firm-level governance metrics

This table presents the heterogeneous effects between competition law index and firm value, across firms with different corporate governance mechanisms. We use three firm-specific measures of corporate governance, which captures the effectiveness of internal governance mechanisms (*Internal Monitoring and Governance*), the effectiveness towards equal treatment of shareholders (*Equal Shareholder Rights*), or the extent of managerial entrenchment (*Managerial Entrenchment*). *Managerial Entrenchment* equals the number of entrenchment provisions commonly observed among international firms, including poison pills, classified boards, blank checks, supermajority votes, golden parachutes, and limited shareholder rights to call for special meetings. *Tobin's Q* equals the book value of total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets. *Competition Law Index* measures the overall stringency of competition laws in a country in a year. Firm-level controls include *Firm Size*, *Leverage*, *Profitability* and *Age*. Country controls include *GDP per capita*. The t-statistics calculated with robust standard errors clustered at the country level are reported in parentheses. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

[illegible]

Table 10 Competition laws and firm value, differentiate by information asymmetries

This table presents the heterogeneous effects between competition law index and firm value, across firms with different degrees of informational opacity. We measure firm opacity using four measures. *Industrial Tangibility* equals the industrial median value of tangible assets (property, plant and equipment) to total assets across firms in the same industry. *Analyst Coverage* equals the number of analysts following the firm. *Discretionary Accruals* denotes the residuals from regressing total accruals on operating terms using Jones model (*Discretionary Accruals (Jones)*) or modified Jones model (*Discretionary Accruals (Modified Jones)*). *Tobin's Q* equals the book value of total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets. *Competition Law Index* measures the overall stringency of competition laws in a country in a year. Firm-level controls include *Firm Size*, *Leverage*, *Profitability* and *Age*. Country controls include *GDP per capita*. The t-statistics calculated with robust standard errors clustered at the country level are reported in parentheses. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	Tobin's Q			
	(1)	(2)	(3)	(4)
Competition Law Index	0.839*** (2.720)	0.641*** (2.890)	0.369* (1.741)	0.365* (1.724)
Competition Law Index*Industrial Tangibility	-1.143*** (-3.397)			
Competition Law Index* Analyst Coverage		-0.0382*** (-3.002)		
Competition Law Index* High Discretionary Accruals (Jones)			0.157** (2.267)	
Competition Law Index* High Discretionary Accruals (Modified Jones)				0.166*** (2.710)
Firm & Country controls	Y	Y	Y	Y
Firm FE	Y	Y	Y	Y
Industry-Year FE	Y	Y	Y	Y
Observations	197,191	197,191	193,554	193,548
R-squared	0.706	0.707	0.706	0.706
# of countries	93	93	81	81

Appendix

Table A1 Competition laws and firm value, differentiate by legal origin

This table presents the heterogeneous effects between competition law index and firm value, across countries with different legal origins. *Common Law* is an indicator that equals one if a country's legal origin is the English common law, and zero if a country's legal origin falls within the civil tradition (i.e., French, German, or Scandinavian). *Tobin's Q* equals the book value of total assets minus the book value of equity plus the market value of equity, divided by the book value of total assets. *Competition Law Index*, measures the overall stringency of competition laws in a country in a year. Firm-level controls include *Firm Size*, *Leverage*, *Profitability* and *Age*. Country controls include *GDP per capita*. The t-statistics calculated with robust standard errors clustered at the country level are reported in parentheses. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

		Tobin's Q	
		Civil-Law countries	Common-Law countries
	(1)	(2)	(3)
Competition Law Index	0.655*** (3.668)	0.670*** (4.065)	-0.161 (-1.170)
Competition Law Index*Common Law	-0.780*** (-4.159)		
Size	-0.300*** (-8.365)	-0.244*** (-8.477)	-0.341*** (-7.659)
Leverage	0.0528 (1.617)	0.0557 (0.777)	0.0577** (2.458)
ROA	0.913*** (12.39)	0.982*** (7.774)	0.875*** (16.93)
Age	-0.0614*** (-2.912)	-0.0990*** (-3.052)	-0.0400** (-2.291)
GDP Per Capita	0.829*** (5.263)	0.809*** (7.059)	0.495 (1.624)
Firm FE	Y	Y	Y
Industry-Year FE	Y	Y	Y
Observations	197,191	103,694	92,446
R-squared	0.707	0.710	0.717
# of countries	93	61	32