Real Effects of Competition Laws: International Evidence

Abstract

We employ the statutory laws that regulate competitions among firms to examine the effect of competition on firms' financing and investment decisions around the world. Using a large sample of 206,713 firm-year observations from 59 countries, we find evidence that the stringency of competition laws spurs improvement in governance that positively influences firms' access to external financing and investment. This finding is robust to several sensitivity tests, including alternative fixed effects, alternative sample compositions and a first-difference change analysis. A breakdown of the competition law index into its two subcategories, namely, *authority* and *substance*, reveals that the effect is mainly driven by the *authority* subcomponent of the competition law index. In cross-sectional analysis, we find that the positive association between the stringency of competition laws and external financing and investment is stronger for firms from countries with weaker institutional environments. Using a sample that covers diverse industries and many countries, our study improves the understanding of the effects of market competition, particularly, how variation in institutional settings matters for the success of competition laws and should be of value to policymakers.

Keywords: competition laws, corporate governance, corporate financing, investment

JEL Codes: G15, G30, K21, L4

1. Introduction

Countries across the world are advocating for policies to tighten antitrust laws to address anti-competitive practices of firms.[1] For example, the U.S. is stressing the need to strengthen antitrust laws and related enforcement institutions to promote competition and enhance efficiency (U.S. House Judiciary Committee's Antitrust Subcommittee 2020; Tracy and Kendall 2021). Similarly, the European Union and the United Kingdom have expressed their intention to pursue new legislations to address anti-competitive behaviors to promote customer welfare and innovation (Schechner 2020). In China, the State Administration for Market Regulation released a draft of new guidelines to stop monopolistic practices.[2] The push for stricter antitrust laws raises questions on whether they are beneficial to firms and to the economy. We investigate this issue by assessing the effect of competition laws on real economic decisions. Specifically, we examine the effect of the stringency of competition laws on firms' financing and investment decisions. We then examine how this association is conditioned on the strength of a country's legal institutions that protect creditors and enforce contracts.

We focus on corporate financing and investment decisions in exploring the economic consequences of intensifying competition laws because they are more likely to be affected by changes in product market interactions (Dixit 1980; Stulz 2000) and are central to firms' value creation, and hence economic growth (Rajan and Zingales 1998; Tirole 2006). The insight into the reality of market frictions such as adverse selection costs and/or moral hazard makes the financing and investment decisions relevant and affects investors' welfare as well as the economy as a whole (Tirole 2006). In consequence, firms with quality governance can raise capital at a lower cost to

[1] Antitrust laws are synonymous to competition laws and denote laws that govern the interaction between corporations and other economic actors in the marketplace and prohibits and penalizes anticompetitive behaviors (Bradford et al. 2019).

[2] https://www.china-briefing.com/news/china-releases-anti-monopoly-guidelines-for-its-platform-economy/

exploit growth opportunities leading to higher valuations (La Porta et al. 2002; Gompers et al. 2003; Albuquerue and Wang 2008).

A common emphasis for instituting competition laws is to create a level playing field for firms and thus promotes efficiency and stimulates development. According to Shleifer and Vishny (1997), market competition is arguably the most powerful force for improving global economic efficiency. The basis of this argument is that competition pressures managers to reduce or possibly eliminate managerial slack, maximize profits, and increase efficiency in order to survive in the market (Hart 1983; Giroud and Mueller 2010, 2011). In a theoretical model, Hart (1983) shows that competition improves governance quality and helps alleviate agency problems that arise from the divergence between manager and shareholder interests. Consistent with this view, empirical studies document that intensive competition induces conservative reporting (Dhaliwal et al., 2014), increases cash flow-enhancing investments (Abdoh and Varela 2018), and mitigates firm-level agency problems as manifested in more dividend payments to minority shareholders (He 2012). In general, intensive market competition can serve as a substitute for weak corporate governance (Alchian 1950; Stigler 1958). Since the reluctance of outside investors to provide capital and the costly nature of external finance is driven by outside investors' concern about being exploited by corporate insiders in possession of private information about firm value (Myers and Majluf 1984) or by managers intent on abusing corporate resources for private benefits consumption, intensifying competition through antitrust laws should ease financing friction and allow firms to raise capital for investment. The governance effect exerted by market competition should alleviate outsiders' concerns by discouraging managers from extracting private benefits and overconsuming incentives in favor of investing in projects that benefit shareholders and increase financial reporting transparency. As a result, outsiders' desire to invest in the firm should increase, resulting

in an increase in firm investment. We, therefore, predict a positive association between the stringency of competition laws and corporate financing and investment.

However, Jensen and Meckling (1976) contend that market competition is ineffective in eliminating agency costs because of managerial delinquency. Also, prior research finds that intense competition has a detrimental impact on firms' information environment due to increasing proprietary cost (Verrecchia 1983; Verrecchia and Weber 2006). Moreover, intensifying competition can increase firm-level uncertainty and exacerbate default risk (Irvine and Pontiff 2009; Zhdanov 2007). This is likely to increase the cost of capital and reduce investment (Schmidt 1997; Valta 2012). For example, Valta (2012) links the higher cost of bank loans to the increased unpredictability of future cash flow and business risk arising from intensive competition. Thus, intensifying competition through antitrust laws may negatively affect corporate financing and investment. Overall, theories suggest that the stringency of competition laws positively or negatively affect corporate financing and investment outcomes. Our empirical investigation is prompted by these contradictory views concerning the impact of the stringency of competition laws on corporate external financing and investment.

To examine this issue, we follow Levine et al. (2020a, 2020b) and exploit a new dataset on competition laws around the world compiled by Bradford and Chilton (2018). Based on countries' provisions on anti-competitive practices, Bradford and Chilton (2018) created an overall competition law index and its subcomponents to measure the extent to which competition policies restrict companies from participating in anti-competitive activities. Higher values of the competition law index signify more stringent antitrust laws that foster competition among firms. Besides its novelty, this dataset provides broader coverage in terms of countries and years. We use this dataset to evaluate the association between the stringency of competition laws and companies'

financing and investing decisions. We measure external financing as the sum of debt and equity issues and proxy for investment using capital expenditure (Shroff 2020).

Using a comprehensive sample of firms from 59 countries between 1991 and 2011, we find a positive and significant association between the stringency of competition laws and external financing and investment. These results are robust to including or excluding firm, industry, and country controls, using alternative sets of fixed effects and alternative sample compositions. In terms of economic magnitude, on average, a one-standard-deviation increase in the competition law index leads to a rise of 0.011 in external financing, equivalent to approximately 11% of the sample mean of external financing. Similarly, a one-standard-deviation increase in the competition law index leads to a rise of 0.002 in capital expenditure. This rise is equivalent to approximately 3% of the sample mean of capital expenditure. Collectively, our results indicate that the stringency of competition laws positively affects firms' financing and investment decisions and support the argument that intensive competition spurs improvement in corporate governance, which helps mitigate financing frictions (Hart 1983; Nalebuff and Stiglitz 1983; Giroud and Mueller 2011).

We conduct several tests to provide support for our identification strategy. First, we employ a change regression to examine the effect of a change in competition law index on the change in firms' external financing and investment to rule out plausible concerns of reverse causality and omitted variable issues. We find that the change in competition law index is positively and significantly related to changes in firms' external financing and investment. We also show that country-level external financing and investment do not predict changes in the competition law index and thus rule out plausible reverse causality problem. Second, we validate the assumption underlying our findings that increases in the competition law index spur improvement in governance by intensifying competition among firms. Specifically, we show that increasing the

stringency of competition laws is associated with material reductions in product market concentration, proxy by Herfindahl-Hirschman index of industry concentration.

Next, we perform a cross-country analysis to consider how variations in country-level institutional factors affect the relationship between competition laws and corporate financing and investment. Prior research documents that firms operating in countries with weaker shareholder protection laws have more severe agency problems than firms with stronger investor protection laws (La Porta et al. 2002, 2008). Consistent with the governance explanation, we predict that the positive effect of the competition laws on firms' financing and investment will be larger among firms in countries with weaker shareholder protection laws and correspondingly smaller among firms in countries with stronger shareholder protection laws. Employing multiple proxies of the legal regime, both time invariant and time variant suggested in prior literature (La Porta et al. 1998; Shleifer and Vishny 1997), we find support for our predictions. Specifically, we find that the positive association between competition laws and corporate external financing and investment to be stronger among firms in countries with weaker investor protection laws.

We further conduct two sets of supplementary tests to provide supports for our finding. First, we consider the subcomponents of external financing, namely equity issue, and debt issue. We find a significant positive association between the stringency of competition laws and equity issue but not debt issue. This finding is consistent with prior studies that find that competition lowers the cost of equity capital (Chen et al. 2014) but increases the cost of bank debt (Valta 2012). We also find a significant positive relationship between the stringency of competition laws and total investment (sum of capital expenditure, acquisition, and research and development expenses). Second, we examine the subcategories of the competition law index; that is, *authority* and *substance*. The *authority* sub-component measures power over the enforcement of competition

laws, while the *substance* sub-component measures the laws that limit (1) agreements among firms to limit competition, (2) mergers and acquisitions, and (3) firms from exploiting their dominant positions. Our finding shows that the results are mainly driven by the *authority* subcomponent of the competition law index.

Finally, we examine the effect of changes in the legal competition environment on firm performance. We measure firm performance using *Tobin's Q* and returns on assets (*ROA*). We find that the competition law index is positively and significantly associated with the two measures of performance: *Tobin's Q* and *ROA* across several regression specifications. These results corroborate our baseline finding that intensifying competition through antitrust laws spurs improvements in governance that enhance firms' access to external financing to increase investment and boost firm performance.

This study contributes to the literature on market competition. Prior studies that examine the implication of market competition employ measures of market structure such as firm size, the speed of profit adjustment, potential entrants or existing rivals, and industry concentration, which are either endogenous or do not accurately capture the contestability of markets (e.g., Harris 1998; Ali et al. 2009; Lang and Sul 2014).[3] We focus on laws regulating competition among firms around the world to study the effect of market competition on corporate decisions. We, therefore, use a clearer identification strategy to shed light on the causality between market competition and firms' financial decisions. Besides providing external validity, this study documents evidence that differences in country-level institutional factors affect the nature of competition. More importantly, because our sample covers different countries and industries, we can reconcile the

[3] A few exceptions are studies who explore import tariff reductions as an exogenous shock to competition and use same to explore various corporate behaviors and economic outcomes (Balakrishnan and Cohen 2011; Flammer 2015; Frésard and Valta 2016).

mixed findings in a single prior industry or country study. Our study is thus worthwhile given that competition is a worldwide phenomenon that is particularly salient due to increased globalization and provides more reliable information to help policymakers frame policies for increasing or decreasing market competition in different institutional settings.

This study also adds to the international business and finance literature on the important role of laws in international studies (Shleifer and Vishny 1997; La Porta et al. 1998; Cumming et al. 2017) and complements recent studies that documents that stringency of competition laws shape corporate valuations (Levine et al. 2020a), corporate innovation (Levine et al. 2020b) and corporate social responsibility (Ding et al. 2020). Specifically, we provide additional international evidence on the effect of changes in antitrust laws on corporate financing and investment decisions. Our finding demonstrates a channel through which competition laws can influence firm valuations. Through their positive impact on external financing and investment, competition laws dramatically affect firm behavior and value in economically important magnitudes.

The remainder of this paper proceeds as follows. Section 2 describes the data and research design. Section 3 reports the major findings, and section 4 concludes the paper.

2. Data and research design

2.1.Variables

2.1.1. Measuring external financing and investment

Following Shroff (2020), we measure external financing as the sum of equity and debt issues. Equity issue is the amount raised from the sale of common and preferred shares scaled by lag total assets. When sale of common and preferred stock is missing, it is assumed there is no equity issue. However, in such circumstances, an indicator variable is included to adjust for any systematic impact of classifying missing equity issuances as zero. Debt issue is the change in total

debt or the net amount of long-term debt issued in a year. We use capital expenditure scaled by lag total assets to proxy for investment. In the robustness test, we use total investment, the sum of capital expenditure, acquisition, and research and development expenses.

2.1.2. Competition law index

We use the competition law index compiled by Bradford and Chilton (2018) for the universe of countries from 1888 through 2010.[4] This competition law index data is novel, and it provides broader coverage in terms of countries and years. Using statutory laws regulating competition among firms in individual countries, Bradford and Chilton (2018) create two scores: *authority* and *substance*. The *authority* index refers to regulations on enforcers of the laws and the extent of their powers, including the use of private litigation or remedies as tools of enforcement. The Substance index refers to the fundamental rules governing competition. Specifically, *substance* includes three sub-categories of rules: anti-competitive agreements, abuse of dominance, and merger control. Aggregating the *authority* and *substance* indexes, they form an overall competition law index that measures the legal and regulatory risks facing firms engaging in anti-competitive activities. Higher values signify more stringent antitrust laws that foster competition among firms. We use the overall competition law index as our measure of the stringency of the laws regulating competition among firms in a country. To shed light on whether our results are driven by certain aspects of the competition law index, we also examine the subcomponents of the competition law index.

[4] This dataset can be obtained from: Comparative Competition Law: http://comparativecompetitionlaw.org/

2.1.3. Control variables

To account for time-varying firm characteristics in our regressions, we follow prior literature (Hadlock and Pierce 2010; Shroff 2017, 2020) and include the following. *Firm size*; defined as the natural log of a firm's total assets in millions of U.S. dollars. *Leverage* is the sum of short- and long-term debt scaled by lag total assets. *Liquidity* is measured as total cash and cash equivalent balance scaled by lag total assets, while *Tangibility* is defined as net property, plant, and equipment scaled by lag total assets. *Tobin's Q* is the market value of equity plus the book value of short- and long-term debt scaled by lag total assets. Return on assets (*ROA*) is measured as income before extraordinary items divided by lag total assets. We use an indicator variable of audit quality that refers to firms audited by a Big four auditors (Big 4) to proxy for accounting quality. *Firm Size, Tangibility,* and *Tobin's Q* are included in the regressions to control for the potential influence of size, asset structure, and growth potentials. We include *Leverage, ROA,* and *Liquidity* to capture firms' financial health and ability to service claims or availability of financing for investment. We winsorize all firm-level variables at the 1% and 99% of their distribution.

We also control for several country-level variables to control for differences across countries. Precisely, we control for *GDP per capita growth, openness,* and *private credit*. *GDP per capita growth* is the annual growth in the GDP per capita and is included to proxy for economic development. *Openness* is defined as the total export and import of a country as a proportion of GDP. It is used to proxy for the extent of globalization as competition is affected by the extent of globalization. *Private credit* proxy for financial development and is defined as the amount of credit banks provide to the private sector as a proportion of GDP.

2.3. Sample construction and description

Our sample begins with the universe of countries covered in the Bradford and Chilton (2018) competition law index dataset. We merge this data with macroeconomic data from World development indicators (WDI) and firm-level financial data from Compustat North America and Compustat Global. To obtain our final sample, we delete observations with insufficient data to compute the control variables, delete observations in financial firms (SIC codes 6000-6000) and utility firms (SIC codes 4900-4999), and delete countries that have less than 50 firm-year observations. Our final sample includes 206,713 firm-year observations involving 26,838 firms from 59 countries from 1991 to 2011.[5] All variable sources are defined in Appendix.

Panels A, B, and C of Table 1 tabulate the distribution of our sample and summary statistics of our key variables by country, year, and industry, respectively. As Panel A shows, our sample covers firms from many countries, and the number of firm-year observations varies substantially across countries. Unsurprisingly, U.S. accounts for the highest (40.75 percent) firm-year observations and Bahrain the lowest (0.03 percent). To provide confidence that our findings are generalizable and not driven by the U.S. firms alone, in robustness tests, we separately estimate the results after excluding the U.S. firms. There is also a large variation in the outcome variables, External financing, and investment across firms from different countries.

Panel B presents the sample distribution by year, which shows a steady increase in the observations from a minimum of 3,352 in 1991 to a maximum of 17,239 in 2010 and decline to 16,423 in 2011. In terms of external financing, it shows that the average external financing is about

[5] The sample starts in 1991 because that is the beginning of Compustat comprehensive firm-level data. Also, the application of one-year lagged on all the independent variables leads our sample period to end in 2011 as the competition law index data provided by Bradford and Chilton (2018) ends in 2010.

10 percent of assets (*External financing*), and the average amount spent on investment is about 6 percent of capital investment (CAPEX).

Finally, Panel C presents the sample distribution by industry. There is substantial variability in the outcome variables across industries. The industry with the largest average external financing is Pharmaceuticals, and the industry with the lowest average external financing is Textiles/Print/Publish. Similarly, the industry with the largest average capital expenditure is Retail: restaurant and the industry with the lowest average capital expenditure is Retail: wholesale.

[Insert Table 1 about here]

2.4. Model specification

Following Levine et al. (2020a, 2020b), we evaluate the association between competition laws and corporate financial policies using the following ordinary least squares (OLS) regression specification.

$$Y_{f,c,t} = \alpha_0 + \beta \times Competition\ law\ index_{c,t-1} + \gamma Controls_{f,c,t-1} + FEs + \varepsilon_{f,c,t,} \quad (1)$$

where *f, c,* and *t* index firm, country, and year, respectively. The dependent variable, *Y* represents either *External financing* or *capital expenditure* as defined above. The key explanatory variable, *competition law index* denotes the stringency of laws regulating competition among firms. Controls denote a set of one- year-lagged time-varying firm characteristics and country traits defined in detail above. We include firm and industry- by-year fixed effects to account for unobservable time-invariant firm characteristics, time- invariant country effects, and time-varying industry effects. We cluster the standard errors at the country level since competition laws are defined at the country level.

3. Results and discussion

3.1. Descriptive statistics

Table 2 presents the summary statistics of the main variables used in this study. The average company obtains external capital (*External financing*) equivalent to 10.1% of its assets and spends 6% of its assets on capital expenditure *(CAPEX*). The mean value of *Equity issue* (*Debt issue*) is 6.9% (2.2%). The explanatory variable of interest, *competition law index* has a mean value of 58.6%. The *authority* (*substance*) subcomponent of the competition law index has a mean of 60% (56.8%). Our control variables have statistics similar to those obtained in prior studies (Leary and Roberts 2010; Shroff 2017, 2020).

[Insert Table 2 about here]

3.2. Baseline results

Table 3 reports the regression results of testing the effects of the stringency of competition laws on corporate financing (columns 1-3) and investment (columns 4-6). For the external financing model in column 1, where we estimate the baseline regression result without any control variables, including only competition law index, firm fixed effects, and industry-year fixed effects, the coefficient on competition law index is significantly positive (0.051, t = 3.166). Column 2 reports the results with firm-level controls added. The results remain qualitatively unchanged (0.050, t=2.477). Column 3 reports regression results with all firm controls and country controls included as specified in Equation 1. We continue to find a significantly positive coefficient on the competition law index (0.042, t=2.124). The estimated coefficients are economically meaningful. Based on the coefficient estimates in column 3, on average a one-standard-deviation increase in the competition law index (0.272) leads to a rise of 0.011 (= 0.272 × 0.042) in external financing.

This rise is equivalent to approximately 10% of the sample mean of external financing and 3% of its standard deviation.

We turn to the investment model. In the model without controls (column 4), the coefficient estimate on the competition law index is positive and significant at the 1% level (0.010, t=2.979). In column 5, we control for firm-level control variables, and the results remain qualitatively unchanged (0.08, t=2.477). Column 6 reports the regression results with all firm controls and country controls included as specified in Equation 1. We continue to find a significantly positive coefficient on the competition law index (0.006, t=1.979). The estimated coefficients are economically meaningful. Based on the coefficient estimates in column 6, on average a one-standard-deviation increase in the competition law index (0.272) leads to a rise of 0.002 (= 0.272 × 0.006) in capital expenditure. This rise is equivalent to approximately 3% of the sample mean of capital expenditure and 2.5% of the sample standard deviation of capital expenditure.

These results support the argument that the stringency of competition laws spurs improvement in governance that mitigates financing friction and thus positively influencing firms' external financing and investment outcomes. It is noteworthy that the control variables generally have coefficients consistent with those in prior studies (Leary and Roberts 2010; Shroff 2017, 2020).

[Insert Table 3 about here]

3.3. Validity check

Although endogeneity problem with respect to reverse causality is unlikely a concern in our study because competition laws are nationwide regulations, we perform two test to provide confidence to our baseline finding. We first perform a change regression where we examine the effect of a change in competition law index on the change in firms' external financing and

investment. This specification helps to address concerns of reverse causality and omitted time-invariant factors that may jointly determine competition laws and external financing and investment. Panel A of Table 4 presents results that regress change in external financing (columns 1 and 2) and investment (columns 3 and 4) on changes in competition law index as well as changes in firm and country level control variables. The results indicate that change in competition law index, is positively and significantly related to change in external financing and investment. Next, similar to Levine et al. (2020a, 2020b), we examine whether external financing and investment at the country level predict changes in competition law index. To do this, we first compute the average value of corporate financing for all firms in a country each year (*External financing_C*) and average investment for all firms in a country each year (*CAPEX_C*). We then assess whether *External financing_C* and *CAPEX_C* in period t-1 predict the competition law index in period t using the following model specifications:

$$Competition\ law\ index_{c,t} = \alpha_0 + \beta \times External\ financing\_C_{c,t-1} + Controls_{c,t-1} + FEs + \varepsilon_{c,t} \quad (2)$$

$$Competition\ law\ index_{c,t} = \alpha_0 + \beta \times CAPEX\_C_{c,t-1} + Controls_{c,t-1} + FEs + \varepsilon_{c,t} \quad (3)$$

We include country and year fixed effects to account for unobservable time-invariant country characteristics and time effects. We estimate equations (2) and (3) using OLS with standard errors clustered at the country-level. Our results show that country-level financing and country-level investment do not predict changes in competition laws index. As shown in Table 4 Panel B, External financing_C (columns 1 and 2) and CAPEX_C (columns 3 and 4) enter insignificantly in all columns. This result holds when including or excluding other country-level traits (*GDP per capita growth, Openness,* and *Private credit*). Altogether, these results suggest that reverse causality is unlikely driven driving our results and affirm that stringency of competition laws affects global financing and investment by spurring improvement in governance.

[Insert Table 4 about here]

3.4. Competition laws and product market competition

The argument underlying our finding is that the stringency of competition laws mitigates financing friction through its governance role garnered from intensifying product market competition. To provide empirical support for this assumption, we examine whether the stringency of competition laws fosters product market competition. Using the Herfindahl-Hirschman index of industry concentration as a proxy for (less) product market competition, we estimate the following regression at the country-industry level:

$$HHI_{c,J,t} = \alpha_0 + \beta \times Competition\ law\ index_{c,t-1} + Controls_{c,t-1} + Fes + \varepsilon_{c,t} \quad (4)$$

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. Controls are one-year lagged country-level traits, including *GDP Per Capita Growth, Private Credit,* and *Openness*. We control for country-by-industry fixed effects in all specifications and alternatively include year and industry-by-year fixed effects. We estimate Equation (3) using OLS with standard errors clustered at the country level.

The result of this analysis is reported in Table 5. We find 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.

[Insert Table 5 about here]

3.5. Interaction between competition laws and legal institutions

In this subsection, we assess the interaction between competition laws and the strength of the institutional environment in terms of corporate financing and investment. Two competing views exist on the impact of competition laws on firms' financing and investment condition on the legal environment. According to the institution substitution view, the effect of competition laws on firms' financing and investment decisions should be stronger in a weak legal regime because competition laws can help reduce the existing gap in institutions among countries and thus make the governance role of competition more visible (La Porta et al. 1998; Leuz et al. 2003). In contrast, the complementary institution view suggests that a strong legal regime could complement competition laws by helping to enhance the effectiveness of competition laws, and therefore, the relation between competition laws and financing and investment becomes even stronger in a country with a strong legal regime.

To provide empirical evidence on the interaction between competition laws and the strength of the legal regime in corporate financial policies, we employ multiple proxies for country-level institutional quality and investor protection. First, we use countries' legal origin following prior studies (La Porta et al. 1998; Shleifer and Vishny 1997). Common law countries are generally associated with stronger investor protection. Accordingly, we create an indicator variable, *Common law*, that takes the value of 1 if a country's legal origin is common law and zero otherwise. Second, we employ the public enforcement index (*Public_Enforcement*) and revised anti-director rights index (*ADR*) from Djankov et al. (2008). The public enforcement index captures the strength of enforcing laws and regulations, as well as protecting minority shareholder interests, and the revised anti-director rights index measures the legal protection afforded minority shareholders with higher values representing a stronger investor protection regime. Finally, we use

the government effectiveness score (*Government_Effectiveness*) from Kaufmann et al. (2011), which is time variant. To estimate the differential effects of competition laws on external financing and investment conditioned on the legal institution, we include the interaction terms of the competition law index and the proxies of the country-level institutional quality and investor protection mentioned above.

The results are reported in Table 6. We find that the effect of competition laws on financing and investment is more pronounced for firms in countries with weaker institutional environments. As shown in Table 6, the linear term, competition law index, enters positively and significantly while the coefficients on the interaction terms between competition law index and the institutional environment proxies are all negative and significant, suggesting that the governance effect of competition laws decreases with the strength of the legal environment. This finding is consistent with the view that intensifying competition is particularly beneficial to firms in economies that give weaker legal protection to shareholders and affirm the substitutivity of market competition and corporate governance.

[Insert Table 6 about here]

3.6. Individual components of external financing and total investment

In this section, we decompose our measure of external financing into equity financing (*Equity issue*) and debt financing (*Debt issue*). As reported in Table 7 columns 1 and 2, we observe a significant positive association between the competition law index and equity issue but the effect on debt issue is insignificant. This finding is in line with prior research that competition increases the cost of bank debt (Valta 2012), and that leverage makes a firm a weak competitor (Zingales 1998). We also recalculate the regression for the total investment measured as the sum of capital expenditure, acquisition, and research and development expenditure and report the result in

column 3 of Table 7. Similar to the baseline findings, we find a positive association between competition laws and total investment. These results corroborate our prediction that reforms intensifying competition among firms spur improvement in governance and help to ease financing friction, thereby allowing firms to raise the needed capital, especially equity capital, to increase investment.

[Insert Table 7 about here]

3.7. Subcomponents of competition law index

To shed light on whether our results are driven by certain aspects of the competition law index, we conduct competition law index component breakdown analysis using *authority* and *substance* as described earlier and shown in Table 1. The results reported in Table 8 show that the coefficient on *authority* is positive and significant for both external financing and investment models but the coefficient on *substance* is insignificant, revealing that the identified effects are mainly driven by the *authority* subcomponent of the competition law index.

[Insert Table 8 about here]

3.8. Robustness tests

We perform several sensitivity tests to ensure the robustness of our findings and report the results in Table 9. In Panel A, we use alternative samples. First, we exclude observations belonging to the United States; the country that accounts for the largest number of firm-year observations in our sample. The results reported in columns 1 and 3 show that the coefficient on competition law index is positive and significant for both the external financing and investment models respectively, suggesting that our results are not driven by this particular country. Second, we exclude countries that have less than 100 observations. The reason for this test is to mitigate issues

related to the uneven distribution of observations across countries. Again, the coefficient on the competition law index is positive and significant for both the external financing (column 2) and investment (column 4) models.

In Panel B, we control for additional country level attributes to alleviates the concerns of potential omitted-variable bias. We are concern that competition laws could be correlated with national policies and institutions that account for differences in corporate financing and investment (Isidro et al. 2020). Omitting these other variables from the analyses could hinder our ability to draw sharp inferences about competition laws. Consequently, our baseline regressions control for country level indicators, including gross domestic product (GDP) per capita growth, credit market development, and the extent of globalization. We also perform a change regression to address reverse causality concern. Moreover, it is less likely that other macro-factors change simultaneously with competition laws across all the countries. Hence, the broad coverage of competition laws from Bradford and Chilton (2018) alleviates the concern that competition laws are systematically associated with any specific macro-factor in the same period. Nonetheless, we control for additional macro-factors mentioned in Isidro et al. (2020) to further address concerns of omitted-variable bias. Specifically, we control for three sets of country level attributes (1) economic indicators (Market capitalization, Stock traded and foreign direct investment (FDI)), (2) regulatory enforcement and the institutional environment (corruption perception index (CPI), checks, and balances (Checks), voice and accountability score (Accountability) from Kaufmann et al. (2011), and Economic Freedom index (EcoFree) from Heritage foundation and (3) measures on nationwide policies and regulations (Board reforms and Takeover laws). Appendix Table A provides detailed definitions for these variables. We follow the same specification in equation (1) and add these additional control variables. As shown in Panel B of Table 9, the baseline results

hold when sequentially or simultaneously including these additional country level attributes. The competition law index continues to enter positively and significantly in both the external financing and investment models. These results mitigate concerns that the association between the competition laws and corporate financing and investment is driven by simultaneous changes of other policies.

In Panel C, we adopt two alternative sets of fixed effect structures. In columns 1 and 3, we adopt firm and year fixed effects in examining the association between competition laws and corporate financial policies. In columns 2 and 4, we control for country, industry, and year fixed effects to provide confidence that we capture the structure of the cross-country panel data showing significant variability in the outcome variables across countries and industries and through time. Using these alternative fixed effects, we continue to obtain results that are consistent with those reported in the baseline. Specifically, we document a positive association between the stringency of competition laws and financing and investment using these alternative fixed effects.

[Insert Table 9 about here]

3.9. Supplementary test

Although not formerly hypothesized, we investigate the effect of the stringency of competition laws on firm performance. We measure firm performance using Tobin's Q and ROA. The result of this analysis is reported in Table 10. We find that competition law index is positively and significantly associated with the different measures of firm performance: Tobin's Q and ROA. The positive association between the stringency of competition laws and corporate performance holds when conditioning on firm and industry-year fixed effects and including or excluding time-varying firm- and country traits. This finding adds to the positive consequences of reforms relating to competition laws.

[Insert Table 10 about here]

4. Conclusions

In this study, we examine the impact of the stringency of competition laws on firms' financing and investment decisions. Using a large sample of 206,713 firm-year observations across 59 countries spanning 1991-2011, we find a significant positive effect of the stringency of competition laws on firms' external financing and investment. The results hold when including firm and industry-year fixed effects, along with an array of time-varying firm- and country traits. We also find that our results hold after excluding the U.S. sample and thus provide confidence in the generalizability of our finding. Further analysis shows that the results are driven mainly by the *authority* component of the competition law index

In cross-sectional tests, we find that the positive association between competition laws and corporate financing and investment is stronger for firms in countries with weaker shareholder rights protection. Our results support the argument that strengthening competition laws spur governance improvement that influences firms' external financing and investment decisions. Using a sample that covers diverse industries and many countries, our study improves our understanding of the effects of market competition, particularly how variation in institutional settings matters for the success of competition laws and should be of value to policymakers.

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Appendix. Variable definitions and sources

Variable	Definition	Data source
External financing and investment proxies		
Equity issue	Equity issuance (data SSTK) scaled by lag total assets (data AT)	Compustat NA and Global
Debt issue	Net debt issuance (data DLTIS minus DLTR) scaled by lag total assets (data AT). When DLTIS and DLTR are missing, this variable equals the change in total debt for the company (change in data DLTT plus change in data DLC) scaled by lag total assets	Compustat NA and Global
External financing	The sum of Debt issue and Equity issue as defined above.	Compustat NA and Global
CAPEX	Capital expenditure (data CAPX) scaled by lag total assets (data AT)	Compustat NA and Global
Total investment	The sum of capital expenditure, acquisition, and research and development expenses.	Compustat NA and Global
Main independent variables		
Competition law index	The overall competition law index, consisting of *authority*, Merger Control, Abuse of Dominance and Anti-competitive Agreements	Bradford and Chilton (2018)
Authority subcomponent index	The *authority* index captures the breadth and depth of *authority* regarding the enforcement of competition laws, such as who has the standing to raise concerns about the violation of competition laws and the remedies available for enforcing those laws	Bradford and Chilton (2018)
Substance subcomponent index	The *substance* index involves provisions concerning (1) agreements among firms that limit competition (Anti-competitive Agreements), (2) mergers and acquisitions (Merger Control), and (3) strategies used by firms to exploit their dominant positions (Abuse of Dominance).	Bradford and Chilton (2018)
Firm controls		
Firm Size	The natural log of a company's total assets in U.S. dollars	Compustat NA and Global
Tobin's Q	Market value of equity (data PRCC_F × CSHO) plus the book value of short- and long-term debt (data DLC + DLTT) scaled by lag total assets (data AT)	Compustat NA and Global
Leverage	The ratio of the sum of short- and long-term debt (data DLC plus data DLTT) to lag total assets (data AT)	Compustat NA and Global

ROA	Return on assets is measured as income before extraordinary items (data I.B.) divided by lag total assets (data AT)	Compustat NA and Global
Liquidity	Total cash and cash equivalent balance (data CHE) scaled by lag total assets (data AT)	Compustat NA and Global
Tangibility	The ratio of total tangible assets measured as net property, plant, and equipment (data PPENT) scaled by lag total assets (data AT)	Compustat NA and Global
Big 4	An indicator that equals one for companies audited by one of the big-four affiliated auditors. The big-four auditors include Deloitte, E&Y, KPMG, and PwC	Compustat NA and Global
Missing equity	An indicator variable that equals one for firm-years in which the variable Equity issue is set equal to zero because the Compustat data item SSTK is missing	Compustat NA and Global
Country controls		
GDP per capita growth	The annual growth in the gross domestic product (GDP) per capita	World Bank
Openness	Ratio of the sum of exports and imports to a country's GDP	World Bank
Private credit	Ratio of domestic credit to the private sector by banks as a percent of GDP	World Bank
Variables used in cross-sectional test		
Common law	An indicator that equals one if a country's legal origin is the English common law and zero otherwise	La Porta et al. (1998)
High Public_Enforcement	High Public_Enforcement is an indicator variable that takes the value of 1 if a country has a value of the public enforcement index constructed by Djankov et al. (2008) that is greater than the median of the sample countries, and 0 otherwise.	Djankov et al. (2008)
High ADR	High ADR is an indicator variable that takes the value of 1 if a country has a value of the anti-director rights index constructed by Djankov et al. (2008) that is greater than the median of the sample countries, and 0 otherwise	Djankov et al. (2008)
High Government_Effectiveness	Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment	Kaufmann et al. (2011)

	to such policies. High Government_Effectiveness takes the value of 1 if the score in year is above the sample and 0 otherwise.	
Other variables		
External financing_C	The average value of external financing across firms in a country each year.	Compustat NA and Global
CAPEX_C	The average value of CAPEX across firms in a country each year	Compustat NA and Global
HHI	Herfindahl-Hirschman Index calculated as the sum of the squared market shares based on firms' sales or total assets	Compustat NA and Global
Capitalization	Stock-market capitalization scaled by gross domestic product	World Bank
Stock traded	Stock trading volume as percent of GDP	World Bank
FDI/GDP	Total foreign direct investment scaled by gross domestic product.	World Bank
CPI	An assessment of corruption within a country	Transparency International
Checks	Level of checks and balances (assessment of the democratic stance of a country).	Database of Political Institutions (DPI)
Accountability	Voice and accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	Kaufmann et al. (2011)
Economic Freedom index (EcoFree)	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.	The Heritage Foundation
Board reforms	Dummy variable that equals 1 if a firm-year observation experiences board reform, and 0 otherwise.	Fauver et al. (2017)
Takeover laws	Indicator variable that equals 1 for the post-M&A law enactment period in the country, and 0 otherwise	Lel and Miller (2015)

Table 1. Sample distribution by country and industry

Panel A: Distribution and Statistics by Country

	Country	# Firms	# Obs.	*Competition law index*	*Authority*	*Substance*	*External financing*	*CAPEX*
1	Argentina	56	462	0.923	0.851	0.945	0.027	0.067
2	Australia	1460	8595	0.705	0.820	0.545	0.293	0.107
3	Austria	61	384	0.754	0.799	0.670	0.040	0.069
4	Bahrain	12	60	0.000	0.000	0.000	0.012	0.042
5	Belgium	90	526	0.605	0.571	0.666	0.031	0.057
6	Brazil	213	1380	0.839	0.857	0.767	0.065	0.073
7	Canada	191	1094	0.870	0.921	0.747	0.258	0.078
8	Chile	108	745	0.554	0.577	0.554	0.046	0.068
9	China	1635	10564	0.593	0.587	0.621	0.048	0.070
10	Colombia	16	98	0.720	0.601	0.860	0.042	0.056
11	Croatia	40	142	0.544	0.490	0.648	0.030	0.064
12	Cyprus	39	158	0.742	0.714	0.758	0.096	0.049
13	Czech	11	63	0.688	0.649	0.733	-0.003	0.055
14	Denmark	134	1071	0.360	0.252	0.526	0.055	0.063
15	Egypt	15	89	0.348	0.417	0.347	0.071	0.079
16	Finland	119	858	0.649	0.571	0.755	0.044	0.052
17	France	591	3805	0.782	0.857	0.651	0.037	0.045
18	Germany	586	3754	0.690	0.786	0.558	0.039	0.046
19	Greece	227	1135	0.549	0.549	0.581	0.053	0.053
20	Hong Kong	789	5999	0.000	0.000	0.000	0.128	0.048
21	Hungary	19	154	0.805	0.769	0.813	0.041	0.097
22	India	1059	5205	0.753	0.778	0.696	0.072	0.091
23	Ireland	73	469	0.849	0.857	0.787	0.089	0.056
24	Israel	197	1385	0.885	0.929	0.767	0.111	0.043
25	Italy	201	1235	0.655	0.571	0.767	0.035	0.040
26	Jamaica	12	87	0.701	0.786	0.581	0.019	0.062
27	Japan	3153	26231	0.991	0.929	0.982	0.003	0.034
28	Kenya	14	68	0.782	0.643	0.930	0.036	0.083
29	Korea, Rep.	596	4202	0.692	0.643	0.748	0.040	0.061
30	Kuwait	35	148	0.232	0.164	0.342	0.073	0.063
31	Luxembourg	25	124	0.248	0.259	0.350	0.051	0.072
32	Malaysia	887	7452	0.047	0.058	0.036	0.038	0.044
33	Mexico	87	711	0.790	0.714	0.854	0.052	0.059
34	Netherlands	142	983	0.235	0.215	0.381	0.055	0.048
35	Nigeria	33	153	0.000	0.000	0.000	0.097	0.129
36	Norway	173	889	0.540	0.487	0.645	0.109	0.080
37	Oman	33	209	0.000	0.000	0.000	0.032	0.091
38	Pakistan	157	1009	0.580	0.554	0.638	0.048	0.079
39	Peru	53	378	0.585	0.623	0.558	0.023	0.063
40	Philippines	130	1131	0.678	0.891	0.397	0.064	0.052

41	Poland	206	969	0.565	0.492	0.688	0.068	0.069
42	Portugal	43	297	0.621	0.558	0.717	0.045	0.047
43	Qatar	14	63	0.267	0.187	0.459	0.118	0.104
44	Russian	27	86	0.671	0.668	0.673	0.112	0.075
45	S. Arabia	34	146	0.868	0.855	0.817	0.050	0.100
46	Singapore	533	4192	0.641	0.653	0.605	0.063	0.053
47	Slovenia	25	68	0.874	0.929	0.744	-0.013	0.041
48	South Africa	272	1946	0.732	0.911	0.481	0.062	0.077
49	Spain	101	554	0.645	0.561	0.761	0.050	0.055
50	Sri Lanka	130	623	0.266	0.436	0.155	0.053	0.067
51	Sweden	325	2237	0.569	0.581	0.581	0.087	0.042
52	Switzerland	222	2008	0.691	0.742	0.618	0.045	0.048
53	Thailand	349	1023	0.678	0.571	0.814	0.034	0.051
54	Turkey	75	150	0.678	0.571	0.814	0.054	0.060
55	U.K.	1915	14687	0.802	0.848	0.704	0.108	0.059
56	US	9034	84236	0.701	0.786	0.581	0.143	0.064
57	Venezuela	16	96	0.575	0.571	0.605	0.038	0.049
58	Vietnam	31	62	0.586	0.500	0.721	0.062	0.066
59	Zimbabwe	14	65	0.834	0.932	0.654	0.306	0.181
	Overall	**26838**	**206713**	**0.586**	**0.600**	**0.568**	**0.101**	**0.060**

Panel B: Distribution and Statistics by Year

	Year	# Obs.	*Competition law index*	*Authority*	*Substance*	*External financing*	*CAPEX*
1	1991	3,352	0.701	0.785	0.582	0.075	0.066
2	1992	3,603	0.703	0.786	0.584	0.086	0.068
3	1993	3,858	0.709	0.792	0.590	0.092	0.073
4	1994	4,318	0.721	0.802	0.601	0.085	0.078
5	1995	4,654	0.716	0.797	0.597	0.124	0.082
6	1996	5,235	0.687	0.768	0.570	0.153	0.084
7	1997	5,904	0.682	0.759	0.569	0.134	0.081
8	1998	6,397	0.679	0.754	0.569	0.131	0.078
9	1999	7,209	0.657	0.727	0.552	0.137	0.069
10	2000	7,806	0.629	0.691	0.537	0.162	0.069
11	2001	9,384	0.704	0.744	0.626	0.069	0.053
12	2002	10,302	0.711	0.745	0.640	0.052	0.044
13	2003	12,039	0.709	0.741	0.643	0.076	0.046
14	2004	13,821	0.680	0.698	0.641	0.106	0.055
15	2005	14,257	0.667	0.683	0.632	0.116	0.059
16	2006	14,541	0.656	0.675	0.619	0.123	0.062
17	2007	14,831	0.665	0.696	0.609	0.131	0.064
18	2008	15,286	0.664	0.695	0.609	0.097	0.062
19	2009	16,254	0.706	0.737	0.639	0.052	0.046
20	2010	17,239	0.709	0.733	0.651	0.091	0.054
21	2011	16,423	0.721	0.745	0.667	0.085	0.057
	Overall	**206713**	**0.586**	**0.600**	**0.568**	**0.101**	**0.060**

Panel C: Distribution and Statistics by Industry

	Industry classification	*# Firms*	*# Obs.*	*External financing*	*CAPEX*
1	Chemicals	1097	8,651	0.067	0.060
2	Computers	2548	17,320	0.148	0.041
3	Extractive	184	1,353	0.070	0.076
4	Food	1218	9,279	0.043	0.060
5	Manf:ElectricalEqpt	1926	16,063	0.085	0.055
6	Manf:Instruments	1107	9,778	0.150	0.045
7	Manf:Machinery	1628	13,260	0.074	0.044
8	Manf:Metal	1180	9,268	0.043	0.056
9	Manf:Misc.	292	2,287	0.062	0.044
10	Manf:Rubber/glass/etc	1058	7,957	0.043	0.064
11	Manf:TransportEqpt	733	6,173	0.054	0.064
12	Mining/Construction	2622	18,318	0.189	0.114
13	Others	636	5,194	0.102	0.046
14	Pharmaceuticals	1274	10,201	0.329	0.043
15	Retail:Misc.	1377	11,176	0.045	0.065
16	Retail:Restaurant	332	2,696	0.065	0.117
17	Retail:Wholesale	1359	10,828	0.059	0.033
18	Services	2729	19,938	0.096	0.057
19	Textiles/Print/Publish	1753	13,654	0.036	0.050
20	Transportation	1785	13,319	0.083	0.086
	Overall	**26838**	**206713**	**0.101**	**0.060**

Table 1 reports the distribution of the full sample. Panels A, B, and C are the sample distribution by country, year and industry, respectively.

Table 2. Summary statistics

	N	Mean	Std. Dev.	P10	P50	P90
External financing and investment proxies						
Equity issue	206,713	0.069	0.265	0.000	0.000	0.112
Debt issue	206,713	0.022	0.138	-0.073	0.000	0.129
External financing	206,713	0.101	0.355	-0.060	0.005	0.271
CAPEX	206,713	0.060	0.080	0.005	0.034	0.137
Total investment	206,713	0.119	0.171	0.008	0.063	0.275
Competition laws						
Competition law index	744	0.586	0.272	0.000	0.678	0.874
Authority	744	0.600	0.285	0.000	0.643	0.929
Substance	744	0.568	0.274	0.000	0.616	0.860
Firm characteristics						
Firm size	206,713	5.084	2.126	2.369	5.089	7.816
Tobin's Q	206,713	1.821	3.252	0.441	0.964	3.255
Leverage	206,713	0.236	0.247	0.000	0.190	0.510
ROA	206,713	-0.048	0.347	-0.252	0.027	0.136
Liquidity	206,713	0.198	0.265	0.012	0.108	0.479
Tangibility	206,713	0.294	0.226	0.038	0.248	0.633
Big 4	206,713	0.546	0.498	0.000	1.000	1.000
Country characteristics						
GDP per capita growth	744	2.148	3.460	-2.503	2.201	6.524
Openness	744	84.576	71.423	29.509	66.66	149.568
Private credit	744	78.375	50.452	22.723	68.935	150.351

This table reports the summary statistics of key variables used in our analysis. For each variable, we present the number of non-missing observations (N), the mean value across observations (Mean), the standard deviation across observations (Std. Dev), and the 10th, 50th, and 90th percentile of the distribution of the variables. Statistics include both firm-level variables and country-level during 1991-2011.

Table 3. Competition laws and corporate financing and investment

	External financing			*Capital expenditure*		
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Competition law index	0.051***	0.050**	0.042**	0.010***	0.008**	0.006**
	(3.166)	(2.477)	(2.124)	(2.979)	(2.477)	(1.979)
Firm size		-0.131***	-0.131***		-0.014***	-0.014***
		(-9.703)	(-9.658)		(-12.405)	(-12.228)
Q		0.033***	0.033***		0.003***	0.003***
		(4.462)	(4.479)		(5.693)	(5.775)
Leverage		-0.174***	-0.174***		-0.026***	-0.026***
		(-5.417)	(-5.377)		(-11.327)	(-11.444)
ROA		-0.110***	-0.110***		0.009***	0.008***
		(-11.092)	(-11.221)		(8.242)	(8.328)
Liquidity		-0.122***	-0.122***		0.024***	0.024***
		(-8.991)	(-9.021)		(10.253)	(10.270)
Tangibility		0.040	0.041		0.018**	0.018**
		(1.148)	(1.182)		(2.164)	(2.171)
Big4		0.010	0.010		0.001	0.001
		(0.985)	(1.027)		(1.338)	(1.277)
Missing_Equity		-0.064***	-0.065***			
		(-3.269)	(-3.374)			
GDP per capita growth			0.004**			0.001***
			(2.090)			(3.133)
Openness			-0.000			-0.000
			(-0.125)			(-0.408)
Private credit			0.000			-0.000
			(0.483)			(-0.372)
Firm FE	Included	Included	Included	Included	Included	Included
Industry-Year FE	Included	Included	Included	Included	Included	Included
Observations	206,713	206,713	206,713	206,713	206,713	206,713
Adj. R-squared	0.284	0.398	0.398	0.474	0.499	0.499

This table reports the regression result on the association between competition laws and external financing (column 1-3) and investment (column 4-6). External financing is the sum of equity and debt issuances scaled by total assets. Investment is capital expenditure scaled by lag 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, Tobin's Q, Leverage, Profitability, Liquidity, Tangibility, and Big 4. Country controls include GDP per capita growth, private credit, and openness. Definitions and sources of all the variables are reported in Appendix. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively. Heteroskedasticity-adjusted t-statistics are in parentheses, observations are clustered at the country level, and the regression controls for firm and industry-year fixed effects.

Table 4. Validity tests

Panel A. First-difference change analysis

Variables	(1) ΔExternal financing	(2) ΔCapital expenditure
ΔCompetition law index	0.107**	0.018***
	(2.357)	(3.208)
ΔFirm size	-0.484***	-0.053***
	(-28.182)	(-24.116)
ΔQ	0.027***	0.003***
	(8.196)	(10.579)
ΔLeverage	-0.326***	-0.023***
	(-2.800)	(-3.376)
ΔROA	0.076***	0.005***
	(7.480)	(5.988)
ΔLiquidity	-0.299***	0.007***
	(-37.644)	(3.872)
ΔTangibility	0.087*	-0.130***
	(1.901)	(-12.392)
ΔBig4	0.002	-0.000
	(0.350)	(-0.026)
ΔMissing_Equity	-0.067***	
	(-4.053)	
ΔGDP per capita growth	0.002	0.000*
	(1.414)	(1.750)
ΔOpenness	-0.002***	-0.000***
	(-3.686)	(-3.116)
ΔPrivate credit	-0.000	0.000
	(-1.159)	(0.513)
Firm FE	Included	Included
Industry-Year FE	Included	Included
Observations	175,122	175,122
Adj. R-squared	0.240	0.043

Panel B. Competition laws and preexisting external financing and investment

	Competition law index			
Variable	(1)	(2)	(3)	(4)
Average country financing	-0.085	-0.070		
	(-1.413)	(-1.619)		
Average country CAPEX			-0.005	0.036
			(-0.066)	(0.481)
GDP per capita growth		-0.002		-0.002
		(-1.081)		(-1.067)
Openness		0.002		0.002
		(1.079)		(1.098)
Private credit		0.000		0.000
		(0.271)		(0.200)
Country FE	Included	Included	Included	Included
Year FE	Included	Included	Included	Included
Observations	626	626	626	626
Adj. R-squared	0.842	0.849	0.840	0.847

This table presents results of tests to rule out plausible endogeneity concerns Panel A reports results of a change regression on the effect of changes in competition law index on change in the external financing and investment. Panel B reports the connection between pre-existing measures of external financing and investment and the competition law index. The dependent variable, Competition law index, measures the overall stringency of a country's competition laws. The key explanatory variable is a one-year-lagged measure of external financing (investment), averaged across firms in each country. Country controls are also lagged one-year and include GDP Per Capita Growth, Private Credit, and Openness. We include country and year-fixed effects. The t-statistics are reported in parentheses, with robust standard errors clustered at the country level. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

Table 5: Competition laws and product market competition

	HHI(Sales)		*HHI(Total assets)*	
Variables	(1)	(2)	(3)	(4)
Competition law index	-0.046*	-0.050**	-0.053*	-0.053*
	(-1.811)	(-1.969)	(-1.691)	(-1.763)
GDP per capita growth	-0.003*	-0.003**	-0.003*	-0.003*
	(-1.862)	(-2.075)	(-1.855)	(-1.995)
Openness	-0.000*	-0.001*	-0.000*	-0.000**
	(-1.712)	(-1.786)	(-1.947)	(-2.088)
Private credit	0.000*	0.000*	0.000	0.000*
	(1.870)	(1.868)	(1.594)	(1.774)
Country-Industry FE	Included	Included	Included	Included
Year FE	Included	No	Included	No
Industry-Year FE	No	Included	No	Included
Observations	206,617	206,617	206,712	206,712
Adj. R-squared	0.877	0.892	0.874	0.893

This table reports the results on 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) and total assets (columns 3-4). We control for country-level traits including GDP per capita growth, private credit, and openness. We include country-by-industry fixed effects and either year or industry-by-year fixed effects. The t-statistics are reported in parentheses, with robust standard errors clustered at the country level. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

Table 6. Competition laws and the legal environment

	External financing				Capital expenditure			
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Competition law index	0.060***	0.065***	0.064***	0.068***	0.010***	0.010***	0.011***	0.008***
	(5.796)	(6.166)	(6.689)	(4.507)	(3.915)	(3.975)	(4.453)	(2.805)
Competition law index × Common law	-0.049**				-0.008**			
	(-2.480)				(-2.051)			
Competition law index × High Public_Enforcement		-0.060***				-0.009**		
		(-3.301)				(-2.251)		
Competition law index × High ADR			-0.051***				-0.010**	
			(-3.127)				(-2.451)	
Competition law index × High Government_Effectiveness				-0.075***				-0.005**
				(-4.079)				(-2.129)
High Government_Effectiveness				0.024				0.001
				(1.609)				(0.906)
Baseline controls	Included	Included	Included	Included	Included	Included	Included	Included
Firm FE	Included	Included	Included	Included	Included	Included	Included	Included
Industry-Year FE	Included	Included	Included	Included	Included	Included	Included	Included
Observations	205,799	205,799	205,799	186,585	205,799	205,799	205,799	186,585
Adj. R-squared	0.399	0.399	0.399	0.410	0.501	0.501	0.501	0.509

This table presents the regression results on the effect of competition laws on corporate financing and investment conditional on several institutional features of the sample countries. Columns 1 and 5 use common law. Common law is an indicator that equals one if a country's legal origin is the English common law and zero otherwise. Columns 2 and 6 are based on the public enforcement index constructed by Djankov et al. (2008). High Public_Enforcement is an indicator variable that takes the value of 1 if a country has a value of the public enforcement that is greater than the median of the sample countries, and 0 otherwise. Columns 3 and 7 are based on the anti-director rights index which is an aggregate measure of how strongly the legal system protects minority shareholders against managers or controlling shareholders in the corporate decision-making process (Djankov et al. 2008). High ADR is an indicator variable that takes the value of 1 if a country has a value of the anti-director rights index that is greater than the median of the sample countries, and 0 otherwise. Columns 4 and 8 are based on the government effectiveness index from Kaufmann et al. (2011). High Government_Effectiveness takes the value of 1 a country has score above the sample median each 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.

Table 7. Competition laws, debt and equity issuances, and total investment

	Equity issue	*Debt issue*	*Total investment*
Variable	(1)	(2)	(3)
Competition law index	0.025***	0.013	0.016***
	(3.511)	(0.982)	(2.706)
Firm size	-0.083***	-0.030***	-0.049***
	(-8.962)	(-6.983)	(-12.197)
Q	0.022***	0.005***	0.010***
	(4.249)	(5.253)	(4.376)
Leverage	-0.001	-0.166***	-0.061***
	(-0.036)	(-3.355)	(-9.173)
ROA	-0.085***	-0.006*	-0.005**
	(-13.441)	(-1.721)	(-2.320)
Liquidity	-0.093***	-0.008**	0.029***
	(-7.864)	(-2.275)	(4.056)
Tangibility	0.003	0.036***	0.032
	(0.150)	(3.619)	(1.586)
Big4	0.006	0.003	0.004
	(0.817)	(1.164)	(0.667)
GDP per capita growth	0.002	0.002***	0.002**
	(1.385)	(3.462)	(2.534)
Openness	-0.000	-0.000	-0.000
	(-0.072)	(-0.236)	(-0.571)
Private credit	-0.000	0.000	0.000
	(-0.055)	(0.844)	(0.947)
Missing_Equity	-0.065***		
	(-3.822)		
Missing_ACQ			-0.036***
			(-4.070)
Missing_RND			-0.040***
			(-6.597)
Firm FE	Included	Included	Included
Industry-Year FE	Included	Included	Included
Observations	206,713	206,713	206,713
Adj. R-squared	0.424	0.125	0.473

This table presents regression results on the effect of the competition laws on the individual components of external financing (equity issue and debt issue) and total investment (the sum of capital expenditure, acquisitions, and research and development expenses. Firm-level controls include Firm Size, Tobin's Q, Leverage, Profitability, Liquidity, Tangibility, and Big 4 auditor dummy. Country controls include GDP per capita growth, private credit, and openness. All independent variables are lagged are one year. We include firm and industry-by-year fixed effects in all columns. The t-statistics are reported in parentheses, with robust standard errors clustered at the country level. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

Table 8. Competition law index component breakdown analysis

	External financing	*Capital expenditure*
Variable	(1)	(2)
Authority subcomponent	0.047***	0.007**
	(3.672)	(2.352)
Substance subcomponent	-0.021	-0.002
	(-0.670)	(-0.368)
Baseline controls	Included	Included
Firm FE	Included	Included
Industry-Year FE	Included	Included
Observations	206,713	206,713
Adj. R-squared	0.398	0.499

This table presents the results on the association between firms' corporate financing and investment and the two subcomponents of the competition law index: *Authority* and *substance*. The *authority* component measures power over the enforcement of competition laws. The Substance component measures the laws that limit (1) agreements among firms to limit competition, (2) mergers and acquisitions, and (3) firms from exploiting their dominant positions. Firm-level controls include Firm Size, Tobin's Q, Leverage, Profitability, Liquidity, Tangibility, and Big 4 auditor dummy. Country controls include GDP per capita growth, private credit, and openness. We include firm and industry-by-year fixed effects in all columns. The t-statistics are reported in parentheses, with robust standard errors clustered at the country level. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

Table 9. Competition laws and corporate financing and investment: Robustness

Panel A. Alternative samples

	External financing		*Capital expenditure*	
	Exclude USA	Exclude < 100 obs.	Exclude USA	Exclude < 100 obs.
Variable	(1)	(2)	(3)	(4)
Competition law index	0.044**	0.040**	0.006*	0.006**
	(2.057)	(2.013)	(1.794)	(2.195)
Baseline controls	Included	Included	Included	Included
Firm FE	Included	Included	Included	Included
Industry-Year FE	Included	Included	Included	Included
Observations	122,406	205,808	122,406	205,808
Adj. R-squared	0.370	0.399	0.502	0.500

Panel B. Additional controls

	External financing				Capital expenditure			
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Competition law index	0.048**	0.067***	0.050**	0.058***	0.010***	0.011***	0.010***	0.009***
	(2.036)	(4.023)	(2.231)	(3.310)	(2.897)	(4.127)	(2.750)	(2.770)
Stocks traded	-0.000**			-0.000***	-0.000			-0.000
	(-2.102)			(-4.289)	(-1.573)			(-0.630)
Market capitalization	0.000**			0.000**	0.000**			0.000*
	(2.314)			(2.528)	(2.549)			(2.020)
FDI	-0.000			0.000	-0.000***			-0.000**
	(-0.323)			(0.186)	(-2.782)			(-2.284)
CPI		0.013		0.012		0.002*		0.002
		(1.518)		(1.388)		(1.760)		(1.181)
Checks		-0.001		-0.001		0.000**		0.000**
		(-1.213)		(-1.528)		(2.471)		(2.205)
EcoFree		-0.004**		-0.005**		-0.001***		-0.001**
		(-2.053)		(-2.195)		(-3.134)		(-2.699)
Accountability		0.158**		0.136**		0.008		0.010**
		(2.660)		(2.426)		(1.570)		(2.034)
Board reforms			0.001	0.001			0.001	0.001
			(0.091)	(0.228)			(0.590)	(1.139)
Takeover laws			-0.013	-0.035**			-0.007*	-0.007**
			(-0.545)	(-2.641)			(-1.783)	(-2.450)
Baseline controls	Included	Included	Included	Included	Included	Included	Included	Included
Firm FE	Included	Included	Included	Included	Included	Included	Included	Included
Industry-Year FE	Included	Included	Included	Included	Included	Included	Included	Included
Observations	171,539	147,704	175,122	144,538	171,539	147,704	175,122	144,538
Adj. R-squared	0.403	0.424	0.400	0.426	0.513	0.526	0.511	0.528

Panel C. Alternative fixed effects

	External financing		Capital expenditure	
	Firm + Year FE	Country + Industry + Year FE	Firm + Year FE	Country +Industry + Year FE
Variables	(1)	(2)	(3)	(4)
Competition law index	0.046**	0.031**	0.006**	0.012***
	(2.053)	(2.256)	(2.067)	(3.202)
Baseline controls	Included	Included	Included	Included
Firm FE	Included	No	Included	No
Industry FE	No	Included	No	Included
Year FE	Included	Included	Included	Included
Country	No	Included	No	Included
Observations	206,713	206,713	206,713	206,713
Adjusted R-squared	0.394	0.287	0.489	0.260

This table shows the results of robustness tests. Panel A is based on alternative samples where columns 1 and 3 (columns 2 and 4) report the results using the sample excluding the U.S. (that requires a country to have at least 100 observations) Pane B reports the robustness checks controlling for additional country level attributes. In columns 1 and 5, we control for additional economic developments indicators including market capitalization, stock traded and foreign direct investment (FDI). In columns 2 and 6, we control for the strength of regulatory enforcement and the institutional environment (corruption perception index (CPI), level of checks and balances (Checks), voice and accountability score (Accountability) from Kaufmann et al. (2011), and Economic Freedom index (EcoFree) from Heritage foundation. In columns 3 and 7, we control for measures on nationwide policies and regulations changes (Board reforms, Takeover Laws). Columns 4 and 8, simultaneously controls for all these additional country level variables. Panel C reports the results adopting alternative fixed effects. Variables are defined in the Appendix. Except in Panel C, we include firm and industry-by-year fixed effects. The t-statistics are reported in parentheses, with robust standard errors clustered at the country. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

Table 10 Competition laws and firm value

	Tobin's Q		*ROA*	
Variables	(1)	(2)	(3)	(4)
Competition law index	0.952***	1.206**	0.021***	0.019**
	(2.984)	(2.512)	(3.193)	(2.514)
Firm size		-0.909***		0.052***
		(-11.582)		(4.700)
Leverage		1.554***		-0.151***
		(9.453)		(-10.479)
Liquidity		0.472***		0.088***
		(4.747)		(16.248)
Tangibility		-0.509		0.007
		(-1.469)		(0.336)
Big4		0.039		-0.002
		(0.923)		(-0.267)
GDP per capita growth		0.005		0.001
		(0.159)		(0.548)
Openness		0.002		0.000
		(0.871)		(1.376)
Private credit		-0.000		-0.000
		(-0.034)		(-1.296)
Q				-0.023***
				(-3.329)
ROA		-0.566***		
		(-3.811)		
Firm FE	Included	Included	Included	Included
Industry-Year FE	Included	Included	Included	Included
Observations	205,493	205,493	206,709	206,709
Adj. R-squared	0.5510	0.5844	0.6082	0.6502

This table presents the effect of competition laws on firm value. Column 1 measures firm value using Tobin's Q, which 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. Column 2 measures firm value using return on assets (ROA), 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, Tobin's Q, Leverage, Profitability, Liquidity, Tangibility, and Big 4 auditor dummy and country-level controls include GDP per capita growth, Private credit and Openness. As in other tests, all explanatory variables are lagged one year. We include firm and industry-by-year fixed effects in all columns. Variables are defined in the Appendix. The t-statistics are reported in parentheses, with robust standard errors clustered at the country level. ***, **, * denote significance levels at 1%, 5% and 10% respectively.