Anti-Collusion Enforcement: Justice for Consumers and Equity for Firms

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We consider the case of changing competition that comes from stronger antitrust enforcement around the world to show that as the equilibrium switches from collusion to oligopolistic competition, firms respond by stepping up equity issuance and increasing investment. As a result, debt ratios fall. These results imply the importance of financial flexibility in surviving competitive threats. Our identification relies on difference-in-difference estimation based on a staggered passage of leniency laws in 63 countries around the world over 1990-2012.

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Price-fixing cartels are pervasive. John Connor's data set of Private International Cartels, comprising 1014 suspected cartels that were either convicted of price fixing or under investigation during 1990-2013, reveals the total affected sales of these cartels to be around $1.5 trillion. The vast majority of the corporate cartelists were from Europe or North America. In recent years, the number of new identified cartels is averaging over 70 per year, suggesting that the share of industrial output that is cartelized, even for developed economies, is substantial.[1]

However, as recent trends in the number of detected cartels suggest, cartels are also crumbling rapidly. Antitrust enforcement around the world has been steadily picking up speed, and according to a recent article in the Economist, is a "hot topic" in corporate boardrooms.[2] Total criminal antitrust fines increased from $107 million in 2003 to $1.1 billion in 2012, and total prison sentences increased from an annual average of 3,313 days in the 1990s to 23,398 days by the end of 2012. Higher fines and new tools such as leniency programs for cartel whistleblowers have led to unprecedented enforcement action not only in the U.S. and the European Union but also in the rest of the world.

The breakdown of collusion is likely to negatively affect profits of the colluding firms, leading to an immediate increase in their leverage ratios, and their probability of default. While there is some evidence on how firms respond to competition shocks due to new entry (caused, for example, by tariff cuts (Xu (2012)), or deregulation (Zingales (1998)), to the best of our knowledge, there is no existing research on how financing choice change when the competition regime itself changes. That is, for identification reasons, the literature has largely studied how firms change their policies when they experience changes in the number or

[1] Some countries (e.g. Austria, Germany, Switzerland, the Netherlands, the Nordic countries, and Australia) had cartel registries at the time when cartels were not illegal in those countries. Hyytinen, Steen, and Toivanen (2014) report that in 105 out of 193 Finnish manufacturing industries at least one cartel of national scope was registered over 1950-90. Their estimates based on Hidden Markov Model suggest that by the end of 1990 almost all industries were cartelized.

[2] The Economist (March 29, 2014).

strength of competitors but the industry equilibrium remains largely similar. When cartels are broken up, the nature of competition moves from collusion to oligopolistic competition, i.e. the type of equilibrium changes as well. How might firms respond to such a change?

In the new competition regime, firms may want to remain highly levered, as theories that stress the strategic value of debt in oligopolistic product markets would suggest. This could motivate new debt issues, or prevent firms from reducing their debt ratios drastically by issuing equity (Brander and Lewis (1986), Chevalier and Scharfstein (1996), Showalter (1995)). Firms may also have to expand production capacity as the equilibrium shifts from collusion to Cournot competition. Since cartel members are likely to be large firms who finance their financing deficits primarily with debt (Frank and Goyal (2003)), debt issuance may increase. Tradeoff theory, on the other hand, suggests that as firms experience higher likelihood of default, they should decrease leverage. The theory, however, does not necessarily spell out the mechanism through which leverage ratios will be lowered – for example, firms could use internal profits to replace debt, or engage in equity issuance. Issuing equity could be costly at a time when the debt is risky, since it would transfer wealth to debtholders. In any case, considerations of pure debt-equity rebalancing are unlikely to be the only relevant factor in this environment, as firms also have to raise financing for capital investment in production capacity. Issuing debt to finance that investment could leave the firm vulnerable to rivals who would be able to pursue more aggressive product market strategies by financing their expansions with equity.[3]

Since theory does not provide clear predictions about how firms' financing behavior responds to a change in the competitive regime, in this paper, we take advantage of the

[3] For example, while issuing equity immediately might involve some wealth transfer to debtholders, equity issuers would be unencumbered by the debt overhang problem and even greater wealth transfer when pursuing future expansion. Zingales (1998) finds that after the Carter deregulation of the trucking industry, firms with higher pre-deregulation debt levels invested less and this affected adversely their survival likelihood.

variation in the cost of collusion coming from the staggered passage of leniency legislation in 63 countries during 1993-2011 to study how more aggressive cartel enforcement affects firms' debt-equity choices and financial leverage. Leniency programs have been one of the most important developments for cartel detection and deterrence (Chen and Rey (2013)). By allowing reduced fines or even providing immunity to cartel members that collaborate in conviction cases, leniency laws are expected to have increased the costs of forming cartels and the benefits of breaking them up.[4] Such strengthening of antitrust policy has changed the competitive landscape and thus provides an opportunity to identify the effect of changes in the strategic interactions between firms on their financing choices and capital structure.

Importantly, even if the leniency laws were similar in nature, countries passed them at different points in time between 1993 and 2011. Based on this staggered nature of the law passage, we are thus able to identify the causal effect of a less collusive product market environment on firms' financing decisions by following a difference-in-difference setting. In other words, controlling for firm- and time-fixed effects, we are able to compare the change in financing choices of firms that were affected by the law to the contemporaneous change in choices of the control group of firms that were headquartered in the countries that have not yet passed such a law.

Our most robust and significant result across all specifications and samples is that following the adoption of a leniency law, firms issue significantly more equity. In some of our specifications, debt issuance activity also increases, though much more modestly. Consistent with more aggressive equity issuance, with some exceptions, we also find that leverage declines following the adoption of a leniency law.

[4] Dong, Massa, and Žaldokas (2014) show that after the passage of leniency laws, the gross margin of the affected firms decreases by 14.8%. A recent case in which four European truck manufacturers (Daimler, Iveco, DAF and Volvo) were awarded a combined EUR 2.93bn of total penalties while MAN, another company that participated in the collusion, received full immunity for revealing the existence of the 14-year long cartel, is a good example of the application of a leniency law.

In alternative specifications, we also control for industry*year and region*year fixed effects to filter out regional or industry-specific trends that could simultaneously affect financing choices of firms and competition policy.[5] We also control for observable variables capturing macroeconomic conditions. To mitigate the concern that the adoption of these laws signaled other events that could affect capital structure through alternative channels, we control for import penetration to capture the effect of trade agreements; capital account openness; adoption of competition law; and corporate governance reform.

As an additional source of exogenous variation, we look at how the financing choices of firms in a country respond not only to that country's adoption of leniency laws, but also to the adoptions in other countries where these firms are likely to experience product market interactions. In particular, we look at how a firm is affected by the passage of leniency laws in countries that are major export destinations of the firm's industry as well as in countries where the firm's subsidiaries are located. An appealing feature of this setting is that the passage of a leniency law in another country is likely to be even more exogenous to any other factors in the home country that might simultaneously affect financing decisions of firms and antitrust policy. Indeed, we find consistent results that equity issuance also increases for firms in an industry when other countries that are important export destinations for that industry adopt a leniency law, or when the laws are adopted in countries where the firms' subsidiaries are located.

While existing evidence suggests that cartels are quite pervasive, the above results do not distinguish between firms that are members of cartels, and those that are not.[6] We expect our

[5] For example, repeated game models of oligopoly (Rotemberg and Saloner (1986) or Green and Porter (1984)) suggest that collusive outcomes and price-cost mark-ups could vary over the business cycle. Antitrust policy could therefore become more active during certain phases of the business cycle. Several papers find that financing policy is sensitive to macroeconomic conditions (e.g. Choe, Masulis, and Nanda (1993), Korajczyk and Levy (2003), Chang, Chen, and Dasgupta (2014)).

[6] In the leniency law literature, a debate exists as to whether the primary effect of leniency laws is to destabilize existing cartels or prevent the formation of new ones. In our context, firms that are not currently colluding might

results to be stronger for the former. Using a database on actual cartel convictions, we find that firms that were convicted in cartel cases increased equity issuance after the convictions. We then use the data to predict the propensity for a firm to be a member of a convicted cartel based on its industry and country, and other firm characteristics. We find that our results are significantly stronger for firms with higher predicted probability of being part of a cartel. We also test if our results are stronger for firms that are larger in size (for example, firms that are amongst the upper 10% in size in each industry in each country) and more profitable firms, since these are the firms that are more likely to be engaged in collusion and therefore more likely to be affected by the passage of leniency law. We find this is indeed the case.[7]

The evidence we provide is also supported by the observations that both asset growth and the financing deficit (net debt plus equity issuance) increase after the passage of leniency laws. What we demonstrate is thus consistent with the interpretation that when the nature of equilibrium in the product market changes from collusion to oligopolistic competition, firms increase investment, and finance such investment with equity to retain financial flexibility. Given that all cartel members are expected to expand investment in production capacity and increase output, financing the expansion with debt would make firms vulnerable to rival firms' strategies, who would be motivated to aggressively expand production capacity financed with equity.

At first glance, our results are also consistent with the tradeoff theory, which suggests that if profits are expected to fall, firms would reduce leverage. Indeed, Xu (2012) examines the

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be taking on debt when industry conditions are favorable because if conditions turn unfavorable, cartelization might be a way to stabilize profits and avoid default. The threat of leniency laws and higher expected costs of cartel formation might deter firms from taking on more debt. It is therefore also possible that the strength of our results stems from firms that are candidates for such potential but not yet formed cartels.

[7] Although we find that the effect is higher in the industries that are more likely to be cartelized, there are reasons why our results may not be limited to existing cartels. For example, the breakdown of collusion in the segment of the market dominated by larger firms is likely to result in these firms expanding output and lowering prices, and so it might lead to lower profitability for smaller firms in the rest of the industry even though they are not cartelized.

effect of higher import penetration (instrumented by tariff cuts and exchange rate changes) on leverage, and finds that profitability drops after greater import penetration; moreover, after controlling for current profitability, leverage drops. She attributes this to expected lower future profitability following a reduction of barriers to entry into the industry.[8]

There are at least two important differences between Xu's (2012) setting and ours. First, Xu (2012) finds that the results are stronger for firms that are financially weaker, which is consistent with the tradeoff theoretic notion that these firms reduce leverage to avoid expected bankruptcy costs. In contrast to Xu (2012), we find that our results are stronger for larger and more profitable firms, who are less likely to be exposed to bankruptcy risk but are more likely to be cartel participants and thus exposed to competition following the passage of leniency law.

Further, unlike firms exposed to greater import competition who experience decrease in asset growth, firms newly exposed to leniency law increase asset growth, which is inconsistent with the adjustment to the target ratio. Byoun (2008) finds that firms with above-target debt ratios are much slower to adjust capital structure towards the target when they have a financing deficit, as opposed to when they have a financing surplus.[9] Therefore, since firms newly exposed to a leniency law increase their financing deficits as they expand output and capacity, it is unlikely that the significant increase in equity issuance activity is purely

[8] A few other recent papers examine the effects of competitive threat on capital structure. Ovtchinnikov (2010) finds that deregulations such as the removal of price controls and entry restrictions are associated with lower capital structure in the future. Valta (2012) finds that the threat of import competition is associated with higher cost of debt. Klasa et al. (2015) find that the risk of losing trade secrets causes firms to maintain lower leverage. Parise (2015) finds that when airline routes of low-cost carriers change, incumbents threatened with new entry increase debt maturity. Hoberg, Phillips, and Prabhala (2014) find that a measure of competitive threat in product markets is positively related to firms' cash holding decisions. In contrast to Xu (2012) and these papers, our focus is the effect of a change in the nature of strategic play between firms on their capital structure decisions. How strategic play changes (e.g. whether firms become more or less collusive) following an increase in entry threats is in general hard to determine (Fudenberg and Tirole (1984), Bulow, Geanakopolos, and Klemperer (1985), Tirole (1988, Chapter 8)).

[9] Hovakimian (2004) also finds that offsetting the accumulated deviation from the target is not the primary reason for issuing or repurchasing equity. Only debt reductions by above target firms are used to adjust back to target – with debt issuances generally causing high debt firms to further deviate from target.

driven by debt-ratio rebalancing motives. Equity issuance, for these firms, serves the dual roles of maintaining financial flexibility in the face of competition and financing asset growth.

Finally, a contemporaneous paper by Ferrés, Ormazabal, and Sertsios (2016) examines capital structure choices of U.S firms that participated in a cartel and are identified in John Connor's database. They find that these firms reduce leverage during the collusion period, which is seemingly at odds with our findings. However, there are a number of differences between our setup and theirs. First, Ferrés, Ormazabal, and Sertsios (2016) only consider U.S. firms that have been convicted, while we examine all U.S. and international firms that have been exposed to leniency law. Second, the experiments are quite different, and the behavior of firms that recognize that collusion is no longer feasible could be dissimilar from that of firms prior to entering a period of collusion. Interestingly, the results on equity issuance and repurchase activities are quite symmetric, – while we find that firms step up equity issuance after the introduction of leniency law, Ferrés, Ormazabal, and Sertsios (2016) discover that firms repurchase equity during collusion period (but presumably also reduce debt as they become more profitable). Another point of similarity with our paper is that these authors also find that when the cartel has greater exposure to countries that have already passed leniency law, debt ratios are lower for cartel members both during collusion periods and post-collusion periods.

1. Empirical Strategy

1.1. Background on Leniency Laws

Given the importance of cartels and their anti-welfare implications, governments have devoted considerable resources in tackling them. One of the most effective tools has been the introduction of leniency laws. Leniency laws allow market regulators (or the courts) to grant

full or partial amnesty to those firms that, despite being a part of a collusive agreement, cooperate in providing information about it. In particular, a typical leniency law stipulates that the first firm that provides substantial evidence to the government (if the latter does not yet have sufficient evidence to prosecute the cartel) gets automatic amnesty. In countries where the firm's managers, employees and directors may face criminal liability for participating in a collusive agreement, amnesty also extends to waiving such criminal liability. As suggested by Hammond (2005), U.S. leniency law, which was strengthened in 1993, proved successful in destabilizing existing cartels and deterring the formation of new cartels and has thus inspired other countries to pass similar laws. In a difference-in-difference setting, Dong, Massa, and Žaldokas (2014) show that the passage of leniency laws significantly harms collusion. In particular, they find that the passage of leniency laws increases conviction rates and generally lowers gross margins of firms, thus also capturing the effect of leniency laws on the unobservable break-ups of cartels. Table 1 reports the list of leniency law passage years around the world.

Although the laws are not passed in a vacuum and are arguably influenced by economic and political conditions in the respective countries, based on our reading of the online discussions and press announcements, countries do not seem to have followed one particular trend and reason for such law passage. Some countries passed the law after prominent collusion cases. For instance, Hungary did so after it faced significant criticism concerning its competition investigation against mobile telephone operators, while Switzerland strengthened its competition law in 2003, including the passage of leniency laws, after it failed to prosecute firms involved in the vitamin cartel. Taiwan passed the law as a response to general concerns about rising consumer prices.

Other countries passed leniency laws after significant pressures from the U.S., the EU or supranational organizations (Lipsky (2009)). For instance, Mexico passed the law in 2006

following general recommendations of an OECD Peers Review in 2004 on Competition Law and Policy in Mexico which reported that its antitrust authority needs better investigative tools, including the ability to give leniency to a whistleblower revealing secret cartel conduct. Similarly, the U.S. had bargained for strengthening of Singapore's antitrust law in its negotiations for a bilateral free trade agreement.[10] Moreover, the EU has fostered the adoption of leniency laws by its member states and often seeks similar provisions in its bilateral association and trade agreements. The IMF and the World Bank ask for the overhaul of antitrust laws as a condition for loans and other funding (Bradford, 2012).

Even if not explicitly pressured, some countries passed the law after noticing its success in other countries. As more countries passed leniency laws, firms from non-passing countries could have been left at a disadvantage. For instance, Japanese companies involved in those international cartels that also affected the Japanese market faced a significant risk of causing an investigation in Japan even if they applied for leniency in the EU or U.S. That hampered the Japanese antitrust authority's cooperation with authorities in other countries.

In fact, in some cases the passage of leniency laws was contentious. For instance, the leniency law met significant opposition in the Swiss Parliament as the law relies on denunciations that run contrary to Swiss legal tradition. Japanese Business Federation (Nippon Keidanren), the most influential industrial organization in Japan, extensively argued against such a law in Japan, claiming that cooperating and informing on fellow participants in exchange for a lower sanction is an affront to Japanese culture, and should only be considered as part of the wider review of the entire criminal law system.

[10] One may argue that free trade agreements might have a similar effect on market structure as cartel busting. Mindful of Singapore's case, we carefully control for country's levels of trade and this does not affect our results. Moreover, we are not aware of any other case apart from Singapore where leniency law was passed as an outcome of a trade deal. Finally, most trade agreements are regional. Controlling for region*year fixed effects also does not affect our results.

1.2. Identification

Against this background, we posit that no single particular trend has led to leniency law passages. We thus employ a difference-in-difference identification strategy to estimate the effect of competition on financing strategies of firms. In particular, we assume that the passage of leniency laws is largely exogenous to firms' investment and capital structure decisions.

Our main estimates are then based on the following regression specification:

$$Y_{it} = \alpha + \beta(Leniency\ Law)_{kt} + \delta X_{ikt} + \tau_t + \gamma_i + \epsilon_{it} \qquad (1)$$

where i, k, and t index firms, countries, and years, respectively. The dependent variable Y_{it} corresponds to the change in common equity over the lagged book value of assets (equity issuance), the change in debt over the lagged book value of assets (debt issuance), or the debt-equity ratio, defined as the book value of debt over shareholder equity. We also provide the results where the dependent variable is the annual asset growth and the total net external finance (financing deficit), equal to equity issuance plus debt issuance.

$(\text{Leniency Law})_{kt}$ equals 0 before the passage of the leniency law in country k, and 1 afterwards. X_{ikt} is a vector of the different firm, country and industry controls, while γ and τ are firm- and year-fixed effects, respectively. In our baseline specification, our control variables X_{ikt} include firm size and profitability, the country's GDP and unemployment rate, imports as a percentage of GDP, and the exchange rate. In a standard difference-in-difference setting, the *treated* group comprises all firms that are headquartered in countries that have passed a leniency law by year t. The *control* group comprises of firms in countries that never adopted a leniency law in our sample period, as well as firms headquartered in countries that adopted a leniency law at some later point of time.

We augment our baseline specification in a number of ways. First, we add two additional firm level controls: asset tangibility and sales growth. We also add controls for other law changes such as the introduction of competition law; the change in corporate governance law and Chinn-Ito index of a country's degree of capital account openness. We also include the volume of imports to a country's industry to address concerns that trade policy changes could be associated with the passage of leniency laws and driving our results. Finally, we include industry*year and geographical region*year fixed effects. The latter sets of fixed effects address concerns that industry trends or regional trade agreements might trigger leniency law changes in some countries and explain our results.

In addition to using the passage of leniency laws in a firm's headquarter country, we implement an alternative identification strategy. We create a treatment variable based on a firm's exposure to the passage of leniency laws in those countries to which the firm's industry sends a significant fraction of its exports. By making it more difficult to form international cartels with industry peers in the countries that are likely to be firm's sales markets, the passage of leniency law in another country also increases the costs of collusion.

This continuous variable that we call *Export Market Leniency Laws* is even more exogenous to political and economic conditions in a firm's country. It is estimated as the weighted average of the passage of laws in all other countries, excluding the country of the firm's headquarters:

$$(Export\ Market\ Leniency\ Law)_{jkt} = \sum_{\hat{k}} w_{\hat{k}j} L_{\hat{k}t}$$

where $\hat{k}$ denotes any country other than country k, j denotes a 3-digit SIC industry, t denotes year. $w_{\hat{k}j}$ is the share of 3-digit SIC industry j's exports from country k to any other country $\hat{k}$ out of all exports from industry j in country k in 1990. $L_{\hat{k}t}$ is an indicator variable that takes

a value of 1 if country $\hat{k}$ has passed a leniency law by year t, and zero otherwise. To avoid endogeneity of industry structures, we remove the time variation and base the weights on the data in year 1990. The variable ranges from 0 when leniency laws are not passed in any country with any market share in the firm's industry to 1 when all foreign countries with any share in the firm's industry have passed the leniency law.[11]

Our alternative specification is then as follows:

$$Y_{it} = \alpha + \beta(Export\ Market\ Leniency\ Law)_{jkt} + \delta X_{ikt} + \tau_t + \gamma_i + \epsilon_{it} \qquad (2)$$

Unlike Equation (1), in Equation (2), unless no country to which a firm's industry is exporting has passed a leniency law, a firm is considered as *treated*, and the intensity of treatment changes as more of the countries to which this industry exports adopt leniency law.

Finally, our third identification strategy relies even more directly on the international nature of firm operations. In the specifications above, we assign our treatment of leniency law passage based on the firm's headquarter country, where presumably most firms have most of their sales. Export Market Leniency Laws measure already considers that firms also sell to other countries and are exposed to the other countries' antitrust codes. However, for a subset of firms we go further and have collected data on their actual international operations. We can thus test whether the passage of laws in other countries where they operate, also has a significant effect. More specifically, we measure a firm's exposure to leniency laws by looking at the distribution of the firm's operations around the world in terms of sales as recorded in Lexis-Nexis Corporate Affiliations database. So, we construct a measure of exposure to leniency law changes based on the proportion of firm activity that takes place in the country that experiences the law change. To illustrate, consider two firms, A and B, both headquartered in Germany. Firm A has 75% of its operations in Germany, and 25% in

[11] Identification based on legal developments in other countries has also been used by Meier (2016).

France; firm B has 25% of its operations in Germany and 75% in France. So, when Germany introduced the leniency law in 2000, firm A should have been affected more than firm B.

2. Data

In our analysis, we consider all non-financial firms in Compustat Global and North America datasets over 1990-2012. Our initial sample covers 543,737 firm-years.

We collect information on the passage of leniency laws in 63 large countries from the Cartel Regulation 2013, published by Getting the Deal Through. We manually double check this information and complement it using press releases and news articles. We report the years when leniency laws were passed in Table 1.

We relate these data to the accounting information from Compustat Global and North America. The data on firm operations around the world come from the subsidiary data in Lexis Nexis Corporate Affiliations database that we manually name match to Compustat.

Export data used to construct Export Market Leniency Laws measure comes from CEPII TradeProd Database that has bilateral trade flows for more than 200 countries at ISIC industry level over 1980-2006. We match them to the 3-digit SIC and average over the respective values within the 3-digit SIC in case multiple 3-digit ISIC codes match to 3-digit SIC codes.

Finally, our source of data on convicted cartels is the Private International Cartel dataset on cartel sanctions created by John Connor and described in detail in Connor (2014). This hand-collected dataset covers all the major private international cartels discovered, disclosed and sanctioned by regulators around the world since January 1986. The dataset omits the cartels for which no sanctions were imposed within five years of the authorities' discovery. It contains 746 cartels involving 7,496 firms (some firms are recidivists and thus members of

multiple cartels). The data have been collected by reading filings, documents, reports and press releases from the antitrust authorities in different countries, as well as newspaper and magazine articles retrieved through search engines like Factiva or Lexis-Nexis. The dataset reports the firms involved, their executives (if they are personally prosecuted), the country of incorporation, the markets and continents in which collusion took place, the duration of the collusive agreement, and, if known, the fines imposed, the leniency granted by the regulators, and the estimated overcharges to the consumers. We manually name-match the firms to the Compustat Global and North America datasets and assign the affected industries their closest relevant SIC code. Wherever in doubt, we exclude the firm or the involved cartel from the analysis.

We report some descriptive statistics in Table 2.

3. Main Results

3.1. Univariate Results

We start by plotting issuance activity and book debt-equity ratios for the affected firms. Figure 1 plots the mean of the mean changes in common stock over asset ratios of treated firms and control firms in the same industry, two years before and after the adoption of a leniency law in a country. Thus, the control firms are all firms in the same industry in countries that had not passed a leniency law in the five years surrounding the event date.

While we see that the equity issuance of control firms is rather stable over time, it shoots up for the treated firms one year after the passage of leniency laws. The debt issuance activity is also rather stable for control firms and follows parallel trends with the treated firms but the debt issuance shoots up after the adoption of a leniency law. These results suggest that both equity and debt issuances increase after the passage of leniency laws. Book debt-equity ratio

also shows parallel trends before the passage of the law and the divergence of trends after these laws are passed.

3.2. Leniency Laws ant the Issuance Activity

In this section, we present regression results to examine the effect of leniency law adoption by a country on the issuance choices of firms in that country. We expect that the firms increase the issuance pattern to shift in favor of equity as opposed to debt (or, alternatively, debt retirements are higher than stock repurchases and dividends). On the other hand, while we expect equity issuances to be higher, we expect debt issuances to increase as well, due to the need to fund new investment after strategic competition intensifies. Panel A of Table 3 presents the results for the net equity issuance while Panel B of Table 3 presents the results for the net debt issuance.

3.2.1. Baseline Regressions

Panel A of Table 3 presents results on our baseline specifications in the difference-in-difference setting which incorporate firm and year fixed effects. The dependent variable is the change in common stock over lagged assets (equity issuance). In column (1), we only consider the effect of a leniency law without any additional controls. Two firm-specific variables and several variables to capture macroeconomic conditions and imports as a percentage of GDP to control for import competition are added in column (2), while the additional control variables – tangibility and sales growth – are added in column (3). In all three columns, the passage of a leniency law has a significant positive effect on the equity

issuance. The results show that for our baseline specifications of the model, equity issuance scaled by lagged assets increases by as much as 7 percent in our specification in column (2).[12]

In column (4), we add industry*year fixed effects. This means that we are comparing treated and control firms in the same year in the same industry – as a result, the specification controls for any common industry trends that could be correlated with leniency law adoption. The coefficient of leniency law remains positive and significant. Column (5) includes region*year fixed effects to absorb factors at the regional level – such as those related to multilateral or regional trade agreements, or any regional economic trends that could affect the capital structure as well as the propensity of leniency law adoption in these regions.[13] The specification thus explores variation within adopting and non-adopting countries within each region and year to examine whether there is any effect of leniency law adoption on issuance activity. The coefficient of leniency law adoption is positive and significant.

Finally, in columns (6) and (7), we perform two important robustness checks that relate to two particular geographic areas. Since the U.S. adopted a leniency law very early in our sample period, and at the same time U.S. firm-years constitute a third of the regression sample in column (2), it is possible that our results are driven by a time-trend affecting U.S. firms only. In column (6), only non-U.S. firm years are retained, and while the magnitude of the effect decreases, the significance of the effect of leniency law remains very similar to that reported in column (2).[14] Finally, in column (7), we address a possible concern with the determination of the year when a leniency law becomes relevant for firms in the EU. While the EU adopted a leniency law that would become applicable to all EU member countries in

[12] Supply side considerations might mean that we could be underestimating the effect of equity issuances. Local equity markets in smaller countries might not be able to absorb large equity issuances coming from the top players in one particular industry at the same time.

[13] We allocate countries into seven geographic regions: North America, Latin America, Western Europe, Central and Eastern Europe, Asia, Africa, and Oceania.

[14] All our main results reported in the paper hold if we exclude U.S. firms from our sample. These results are available in the Internet Appendix, Tables IA3-IA5.

2002, individual countries passed a leniency law that would apply to all firms doing business with these countries in a staggered manner. In column (7), we assume that the effective date for leniency for an EU member is the later of 2002 and the year the country joined the EU. Our results remain unchanged.

In Panel B of Table 3 where we run similar regressions for net debt issuance, by following the same structure of the specifications, we find a positive effect of leniency laws on the net debt issuance as well. The fact that both debt and equity issuances increase is consistent with our expectation that the financing deficit increases after the passage of leniency laws as firms step up investment. However, most of the effect comes from the equity issuance. The economic magnitude of the effect of a leniency law, though positive and often statistically significant, is about a tenth of that for equity issuance. In particular, the effect for net debt issuances is positive and significant in the baseline specifications (columns (1)-(3)) but not robust if we control for industry*year fixed effects (column (4)), region*year fixed effects (column (5)), limit the sample to non-U.S. observations (column (6)) or consider the EU as a single geographic zone (column (7)).

Among firm-level control variables in Panels A and B, we find that asset size is associated with higher issuance activity while profitability is associated with the lower issuance activity. Tangibility has contrasting effects for equity and debt issuance, – while higher tangibility of assets correlates with lower equity issuance, it is associated with higher debt issuance, consistent with the previous literature.

3.2.2. Export Market Leniency Laws

In this section, we repeat the same tests as in Table 3, replacing the leniency law adoption indicator variable with the Export Market Leniency Laws measure that looks at the leniency

law adoption in the countries other than the firm headquarter country. In addition, we study the subsidiary-sales-weighted measure of leniency law adoption in other countries.

Table 4 reports the results. As before, in Panel A we report the results for net equity issuance while in Panel B we report the results for net debt issuance. The coefficient of the Export Market Leniency Laws variable is positive and significant in all specifications in Panel A. The results suggest that as the exposure of domestic firms to markets under leniency law increases, suggesting greater exposure to markets characterized by non-collusive behavior, equity issuance rises. Results for subsidiary exposure to leniency laws reported in column (7) of Panel A are similar. In contrast, the results in Panel B are again smaller in economic magnitude and weaker, suggesting that debt issuance does not rise as much following leniency law passages in countries with which firm's industry trades.

We perform similar sets of robustness tests as before. Columns (2) and (3) control for additional firm variables. Column (4) includes 3-digit SIC industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. Our results are robust to these specifications: both equity and debt issuances increase, but the magnitude of the effect for equity issuance is about ten times that for debt issuance.

Overall, taken together, the results so far have shown that while both issuances of debt and equity have increased following the passage of leniency laws, the financing to fund investment comes primarily from equity issuance. Frank and Goyal (2003) show that in the full Compustat sample of U.S. listed firms in the 1971-89 period, less than 30% of the incremental financing deficit is financed with debt issuance. However, this result is primarily due to small firms' dependence of equity as opposed to debt as a source of finance (Frank and Goyal (2003), Table 6). Therefore, if our results are primarily driven by small firms' issuance

behavior, the results can be understood in terms of the conventional wisdom that small firms finance investment with equity. On the other hand, if our results are driven by larger firms, then this represents a significant shift in the financing behavior of larger firms in response to a change in the competitive scenario. In Section 4.1, we explore such heterogeneity of our results.

These varying results on debt and equity also mean that it is unlikely that the result is driven by lower collusion in the supply of capital. If leniency laws affected the collusion between financial institutions, it is more likely that the supply of debt capital such as bank lending would have been affected, as opposed to the supply of equity capital. In such case, debt should have become cheaper and thus firms should have expanded their borrowing.

3.3. Debt-Equity Ratio

In this section, we present the results of the regressions that examine the effect of leniency law adoption on the book debt-equity ratio. The effect of leniency law on the book debt-equity ratio reflects the type and size of issuance activity as well as firm retention policy (which in turn depends on profitability). While the tilt towards equity issuance is likely to lower the debt-equity ratio, lower profitability is likely to raise it.

To avoid outliers and negative values, we limit the book debt-equity ratio between 0 and 9 (which corresponds to the debt-asset ratio of 0 to 0.9). [15] Table 5 presents the results. Panel A presents results on our baseline specifications in the difference-in-difference setting which incorporate firm and year fixed effects. In column (1), we only consider the effect of a leniency law without any additional controls. Two firm-specific variables and several

[15] Our results hold if we change the dependent variable to be the debt to debt plus equity ratio, which is a monotone transformation of the debt-equity ratio. We only consider book debt ratios because of missing data required to calculate the market value of equity for international firms. Our results also hold if instead of limiting debt-equity ratio to be between 0 and 9, we limit to between 0 and 8, or if we exclude negative values and winsorize the book debt-equity ratio at 1%, 5% or 0.5%.

variables to capture macroeconomic conditions and imports as a percentage of GDP to control for import competition are added in column (2), while additional firm characteristics are added in column (3). In all three columns, the passage of a leniency law has a significant negative effect on the debt-equity ratio. The economic magnitude of the impact is large: in the baseline specification of column (2) of Panel A, the treated firms reduce the debt ratio by 0.046 relative to control firms, which is 6% (12%) of the sample mean (median) debt ratio. Among the control variables, leverage is positively related to firm size (log book value of assets) and negatively related to firm profitability (ROA), which are well-documented results in the literature (see Frank and Goyal (2009)). Leverage is positively related to the country's GDP, and negatively related to changes in the exchange rate, which is likely to reflect competitive pressure and may be capturing an expected decline in future profits. While tangibility has a significant positive effect on the debt-equity ratio (consistent with the literature), lagged sales growth is insignificant.

The negative results are consistent if we add industry*year fixed effects (column (4)). Column (5) includes region*year fixed effects to absorb factors at the regional level and the coefficient of leniency law adoption is negative and significant.

As before with the issuance activity, in column (6) we perform robustness checks where we limit the sample to non-U.S. firms. We find that the significance of the effect of leniency law remains very similar to that reported in column (2). Finally, in column (7), we assume that the effective date for leniency for an EU member is the later of 2002 and the year the country joins the EU. Our results remain unchanged.

Panel C reports the results, where we instead use Export Market Leniency Laws for identification. The coefficient of the Export Market Leniency Laws variable is negative and significant in almost all specifications. The results suggest that as the exposure of domestic

firms to markets under leniency law increases, suggesting greater exposure to markets characterized by non-collusive behavior, debt ratios decline. The economic magnitudes suggest that as a firm in an industry goes from no exposure in its major export market to exposure in all its export markets, the debt-equity ratio increases by about -0.089 in the baseline specification in column (2) of Panel C, or about 12% (22%) of the sample mean (median) debt-equity ratio. Results for subsidiary exposure to leniency laws reported in column (7) of Panel A are similar.

Overall, the results reported in this section suggest a strong causal relationship between the adoption of a leniency law and capital structure.

3.4. Asset Growth and Financing Deficit

The findings of leverage changes following tariff changes in Xu (2012) indicate that after a drop of profitability over-leveraged firms sell off assets to pay down debt. Indeed, decreasing entry barriers in the context of a stationary demand curve are likely to lead to a decrease in incumbent firms' investment opportunities and thus lead to lower corporate investment.

In contrast, reduced collusive practices between the existing players are likely to have led to expanded output. We reconfirm this intuition on the increase in asset growth in Table 6. We report using our specifications as before, plotting the results on leniency law in Panel A and results on export market leniency law in Panel B. Using both identification strategies, we find that stronger actions against collusion have led to a faster growth in assets, i.e. larger investment.[16] We note that such increase in asset growth and investment comes despite the drop in profitability, as reported in Dong, Massa, and Žaldokas (2014).

[16] Our results are qualitatively identical if instead of asset growth we use investment, defined as the annual change in fixed assets, adjusted for depreciation.

Further, we study how the increase of investment is funded. We look at financing deficit. Following Chang and Dasgupta (2009), the financing deficit is defined as the difference between a firm's requirement for funds (due to investment and dividend payments) and internally generated funds, and is identically equal to the sum of net issue of debt plus net issue of equity. Our results, based on the same specifications as before, are reported in Table 7. We find that leniency laws lead to a higher financing deficit. This stands in contrast to testing the trade-off theory by exploiting tariff changes. Firms step up issuance activity in general following the passage of a leniency law.[17]

4. Targeted Treatment, Robustness Tests and Other Supportive Evidence

4.1. Targeted Treatment

Not all industries are cartelized. Leniency law is likely to affect mostly those firms that are engaged in collusion, or have the potential to form cartels in the future. The latter firms are also relevant for our study because if the expected cost of cartel formation increases, firms might change behavior, including their financing choices. For example, firms might be more willing to take on more debt if, under adverse industry conditions, cartelization becomes more feasible. If the cost of cartel formation increases, these firms may want to reduce debt even though they are not currently engaged in collusion.

We conduct four sets of tests and report them in Table 8. First, we estimate the propensity of a firm to be convicted in a cartel case. We use a prediction model based on time-varying firm characteristics (asset size, leverage, and ROA), country characteristics (GDP and unemployment), as well as country fixed effects and three-digit SIC fixed effects. Industry characteristics are an important determinant of the potential for cartelization since cartels are

[17] As reported in Internet Appendix, we find that cash holdings also do not increase following issuance activity, which is consistent with the fact that firms are using the raised equity to expand rather than prop up cash balances to reduce default probability (Table IA1).

known to proliferate in certain industries (see, for instance, a survey by Levenstein and Suslow (2006) who discuss a number of historical examples of industries in which there are repeated episodes of collusion).[18] Country-specific institutional features are also likely to be important determinants. We fit the prediction model by only using pre-leniency observations and predict the probability that the firm will be convicted in the cartel case after the passage of a leniency law.

Panel A reports results for the equity issuance (columns (1)-(2)), debt issuance (columns (3)-(4)), debt-equity ratio (columns (5)-(6)), asset growth (columns (7)-(8)) and financing deficit (columns (9)-(10)) as the dependent variable for both the leniency law dummy and the export market based measure. Both measures are interacted with the predicted probability of conviction. Firms that are more likely to be convicted issue more equity and reduce leverage more after the passage of leniency law in the home country. Meanwhile, the effect of the Export Market Leniency Laws measure on equity (debt) issuances is more positive (negative) for firms with higher predicted probability of conviction.

Second, in Panel B, we sort the firms according to their ROA with respect to their country and 3-digit SIC industry in a particular year, and create a dummy if the firm's ROA is higher than that of the median peer ROA (by country, industry and year). More profitable firms within the industry are more likely to have been engaging in the cartel. We then interact leniency law passages with this dummy variable. Columns (1)-(2) and (3)-(4) report the results on net equity and net debt issuances, respectively, while columns (5)-(6) report the results on leverage. We find that our results on equity issuances and leverage are stronger for more profitable firms in the industry. We also report results for asset growth (columns (7)-

[18] Admittedly, a 3-digit SIC classification is a coarse partitioning of industry for our purposes, since many of the cartels have been known to proliferate for specific products, such as potash.

(8)) and financing deficit (columns (9)-(10)) and also find stronger results for more profitable firms in the industry.

Finally, in Panel C we go even further and just focus on the largest firms, defined as top 10% in terms of size in each SIC3 industry, country and year. We posit that the largest firms will get affected most as they are more likely to be part of the cartels and affect product prices. Indeed, the effect becomes stronger on the positive issuance of equity and weaker on the positive issuance of debt. These results are striking in that larger firms generally support higher investment mainly through higher reliance on debt, as shown in Frank and Goyal (2003). However, when the competitive scenario changes, we find that these firms rely more on equity financing. Smaller firms (consistent with conventional wisdom) rely more on equity than debt, but the financing behavior does not change their debt ratios.

Overall, these results do not find much support for theories that argue that debt has strategic value in oligopolistic industries. Debt has no strategic value when firms can collude, and its strategic use is most likely to be observed when collusion breaks down and firms that were previously colluding start to compete. However, we find no evidence that the debt ratio goes up after the passage of leniency law for firms that are more likely to be cartel members. On the contrary, debt ratios fall and firms increase equity issuance.

While the reduction in the debt ratio following the passage of leniency laws is consistent with several alternative theories, our results in this section suggest that the channel through which competition affects leverage is different from the one in Xu (2012). Xu (2012) finds that leverage drops when there is greater import penetration in an industry (caused, for example, by tariff cuts or currency depreciation), and suggests that this could be because firms anticipate lower future profits. Tradeoff theory implies that firms will reduce leverage when expected bankruptcy costs increase. Consistent with this interpretation, she finds that

the effects come mainly from firms with a low z-score, or those that are financially weak. In contrast to Xu (2012), we find different results in this section where we explore which types of firms respond more to the passage of leniency law. We find that our results are stronger for firms that are more likely to be cartel members, and are larger and more profitable. Thus, at current levels of leverage, it is not the case that these firms face significant risk of default. However, the shift to a new equilibrium potentially creates a situation in which financing growth with debt could leave these firms vulnerable to aggressive strategies by their rivals. Financing asset growth with debt could mean that the firm is unable to respond to future expansion by more conservatively financed rivals due to the debt overhang problem – in fact, debt financed firms might invite even more aggressive predatory reactions from rival firms that are unencumbered by debt.[19]

4.2. Robustness Tests

4.2.1. Changes in the Degree of Competition and Passage of Other Legislation

We provide additional robustness checks for our results in Table 9, where we aim to control for the other changes in the degree of competition and passages of other legislation. Panel A shows results for the equity and debt issuance, Panel B shows the results for debt-equity ratio while Panel C shows the results for financing deficit and asset growth. The results are consistent.

We start with Panel A. The first four columns relate to the net equity issuance while the last four columns relate to the net debt issuance. In columns (1) and (5), we control for other types of policy changes that could have overlapped with leniency law adoption, such as the general competition law, corporate governance law or Chinn-Ito index of capital market

[19] Since the firms participating in collusion prior to the passage of a leniency law are likely to expand output, it is possible that those outside the cartel face the prospect of lower future prices and profits. Such firms could well be reducing leverage to lower the expected bankruptcy costs, consistent with tradeoff theory.

openness. We do not find that any of these laws affect our estimate. This is comforting as, for instance, capital market openness arguably correlates with the country's integration into the global economy, so our leniency law variable is not simply proxying for that. Further, in columns (2) and (6), we show that controlling for the Herfindahl-Hirschman Index has no effect on the coefficient of leniency law. As shown in columns (3) and (7), the volume of imports to the firm's industry also does not affect the effect of leniency law on issuance activity, suggesting that we are capturing a distinct effect of changing international trade activity that the firm faces.

We recognize that there were additional changes in antitrust law during our period of study. In particular, there has been a significant increase in penalties, changes in what constitutes cartel conduct and new violation provisions as well as investigative powers of antitrust authorities. We focus on leniency law as the passage of leniency law is a clearly identifiable and measurable event while other provisions might have occurred at multiple times in each country (e.g. change in penalties[20]) or might have had unclear effects on the cartel conduct (e.g. changes in violation provisions). If anything, even if there were correlated changes in anti-cartel provisions, our identification using leniency law should then proxy for a general strengthening of the anti-cartel provisions and are informative of a general enforcement effect. That said, our estimates might be biased if we misattribute the gradual strengthening of anti-cartel provisions to one particular year (i.e. when leniency law was passed). For some countries, we were able to collect data on other provisions from International Competition Network and control for them explicitly by adding dummies when, e.g. the first penalty was increased in our sample period or the first time when the definition of what constitutes cartel conduct has been changed. As can be seen in columns (4) and (8),

[20] Measurable changes such as changes in penalties might have been anticipated and a binary treatment might overshoot or undershoot the impact, depending on the market's expectations (Hennesy and Strebulaev, 2015).

such controls do not significantly alter our estimates, giving confidence that the passage of leniency laws has been a crucial measure in fighting cartels.

We continue with the robustness checks for debt-equity in Panel B. Columns (1)-(3) represent additional robustness checks that relate to the other changes to competitive environment. The coefficient of leniency law remains negative and significant. In column (4), we control for other types of policy changes. Interestingly, capital account openness, which captures how open the country is to cross-border financial transactions, has a significant negative effect on capital structure, but does not affect the coefficient of leniency law. Controlling for the Herfindahl-Hirschman Index has no effect on the coefficient of leniency law. The volume of imports to an industry in a country is itself insignificant and does not affect the effect of leniency law on capital structure.

In columns (5) and (6), we add lagged leverage as an additional control, in the spirit of target adjustment models and also to capture the fact that leverage is highly persistent. The inclusion of lagged leverage allows us to interpret the coefficients of the other right-hand side variables as their effects on the change in the debt-equity ratio. The effect of leniency law on the change in leverage is also significantly negative, and the estimated magnitude of the effect increases three-fold when firm fixed effects are dropped.[21]

Finally, in Panel C, we present results for financing deficit and asset growth. The first four columns relate to the financing deficit while the last four columns relate to the asset growth. We perform same specifications as in Panel A and do not find that controlling for other legal changes as well as competition variables affects our estimates of the leniency law effect. In Table IA2 of Internet Appendix, we also provide similar robustness checks for Export Market Leniency Law variable. Our results are robust.

[21] Note that the specification in column (5) which includes firm fixed effects is known to produce biased coefficient estimates because of the presence of the lagged dependent variable (Nickell (1981)).

Also, all these results are consistent if we limit the sample to non-U.S. firms. In Tables IA3-IA5, we replicate Tables 3-5 that provide the main results of the paper. We find that most of the results consistently show that, following leniency law passages outside of the U.S. as well as export markets of a non-U.S., the equity issuances increased. We see no changes in debt issuances. Finally, while in the specifications above we cluster results at the country*industry level since the cartel activity is likely to be defined at that level, our results are consistent if we cluster at the coarser country-level or finer firm-level.

4.2.2. Large Issuances

In Table 10, Panels A and B, we estimate probit models for large equity (debt) issuances and repurchases. A large equity or debt issuance is defined as a net increase in excess of 5% of book value of assets, while a large repurchase (debt retirement) is defined as a net decrease of more than -1.25% (-5%) of assets.[22] The tables report probit marginal effects. The results suggest that passage of a leniency law leads to a 13% increase in the likelihood of a large equity issuance, compared to a 7.5% increase in the probability of a large debt issuance. There is also a 1% increase in the probability of a debt retirement, though there is no effect on repurchase of equity.

4.2.3. Dynamics

In Table 11, we explore the dynamics of the treatment effect – in particular, whether they show up within a relatively short period after the passage of leniency law of not. To explore the dynamics of the issuance activities and leverage change, we create a dummy variable corresponding to post-law change period, and additional dummies for years 3-4, years 5-6, and beyond. We find that firms first start issuing equity and do it over the first two sub-

[22] We follow Hovakimian, Opler and Titman (2001), Leary and Roberts (2005), and Xu (2012) in defining these cut-offs.

periods and later switch to issuing debt. The effect on the debt ratio shows up within the first three sub-periods and there is no additional effect in the later years.

4.3. Cartel Convictions

Finally, we look at the actual cartel convictions. We replicate our results by focusing on the cases where the firms were actually convicted in price-fixing cartel investigations. Here we rely on the data in the Private International Cartel dataset (Connor, 2014). This hand-collected dataset covers all the major private international cartels discovered, disclosed and sanctioned by regulators around the world since January 1986. We manually name-match the firms to the Compustat Global and North America datasets. Wherever in doubt, we exclude the firm or the involved cartel from the analysis.

We show results in Table 12, where our main explanatory variable is whether the firm has been convicted in a cartel case in the past five years by any antitrust authority around the world (i.e., it could have been convicted in a foreign market). We find that following convictions firms increase equity issuances (column (1)) but do not change debt issuances (column (2)).

Conclusion

We consider the case of a change in competition that comes from stronger antitrust enforcement around the world to show that more intense strategic competition and expanding output leads to significantly more equity issuance, a slight increase in debt issuance, and lower leverage ratio. The increase in issuance activity is associated with a higher level of investment activity – the latter is consistent with firms competing to grab market share.

Our identification relies on the difference-in-difference estimation based on a staggered passage of leniency laws in 63 countries around the world over 1990-2012. In addition to

exploiting a leniency law passage in the firm's country, we look at the leniency law passages in the main export markets of the firm's industry, leniency law passages in the firm's subsidiary locations as well as actual convictions in cartel cases, and find consistent results.

Our results are stronger for more profitable and larger firms, suggesting that the effects on leverage are not due to expectations of lower future profits that increase the likelihood of default. We argue that as collusion becomes harder to sustain, the nature of equilibrium switches from collusion to oligopolistic competition. Firms have to expand investment to compete for market share, but prefer to do so with equity rather than debt to maintain financial flexibility and avoid debt overhang.

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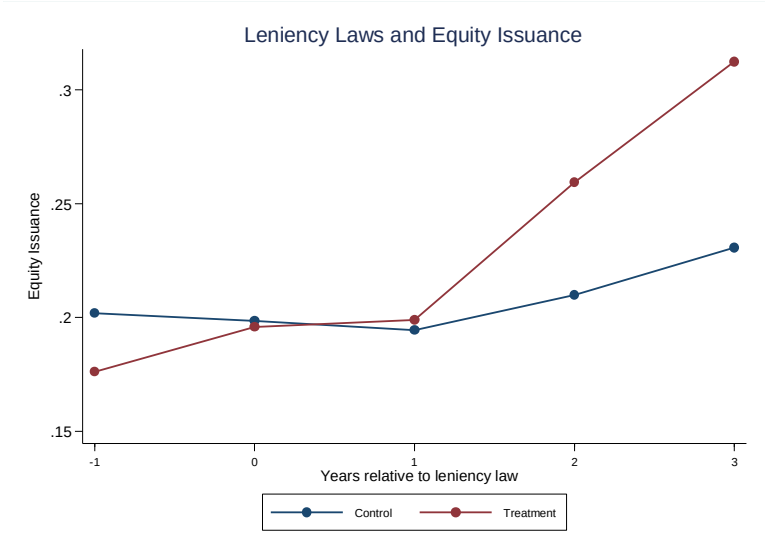
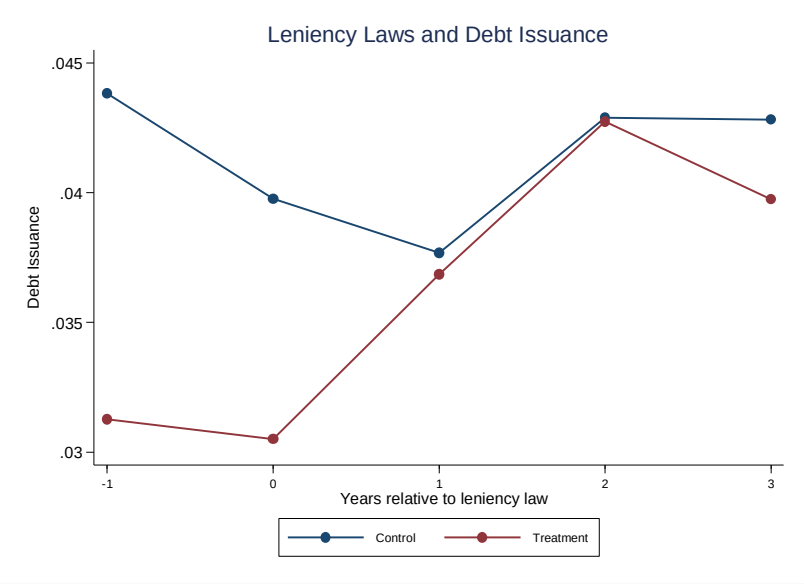
Figure 1. Trends

We plot mean change in common stock over lagged assets, winsorized at 1%, mean change in financial debt over lagged assets, winsorized at 1% as well as median change in book debt to book equity ratio, limited between 0 and 9, for firms that were affected by a leniency law for the period of 2 years before to 2 years after the leniency law. As a control sample, we consider firms that were not affected by a leniency law over the same period as the treated firm but were in the same SIC3 industry, i.e. control firms did not have a leniency law introduced over 2 years before to 2 years after the introduction of the leniency law for the treated firm.





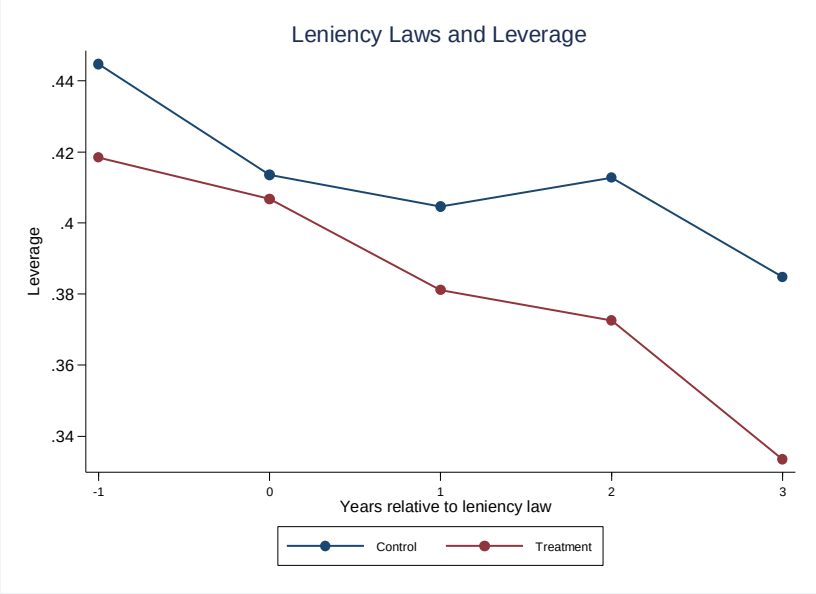

Leniency Laws and Leverage
Leverage
.44
.42
.4
.38
.36
.34
-1
0
1
2
3
Years relative to leniency law
Control
Treatment

Table 1. Leniency Laws

This table reports leniency law passage by country. Our primary source of information is Cartel Regulation 2013, published by Getting the Deal Through. We complement this dataset using press releases and news articles.

Country	Year	Country	Year
Argentina	None	Lithuania	2008
Australia	2003	Luxembourg	2004
Austria	2006	Malaysia	2010
Belgium	2004	Mexico	2006
Brazil	2000	Netherlands	2002
Bulgaria	2003	New Zealand	2004
Canada	2000	Nigeria	None
Chile	2009	Norway	2005
China	2008	Oman	None
Colombia	2009	Pakistan	2007
Croatia	2010	Peru	2005
Cyprus	2011	Philippines	2009
Czech Republic	2001	Poland	2004
Denmark	2007	Portugal	2006
Ecuador	2011	Romania	2004
Estonia	2002	Russia	2007
Finland	2004	Singapore	2006
France	2001	Slovakia	2001
Germany	2000	Slovenia	2010
Greece	2006	South Africa	2004
Hong Kong	None	Spain	2008
Hungary	2003	Sweden	2002
Iceland	2005	Switzerland	2004
India	2009	Taiwan	2012
Indonesia	None	Thailand	None
Ireland	2001	Turkey	2009
Israel	2005	Ukraine	2012
Italy	2007	United Kingdom	1998
Japan	2005	USA	1993
Jordan	None	Venezuela	None
Korea	1997	Zambia	None
Latvia	2004		

Table 2. Summary Statistics

This table reports summary statistics for the main variables used in the subsequent analysis. Debt/equity ratio is limited between 0 and 9. ROA, net equity issuance, net debt issuance, and sales growth are winsorized at 1%.

	N	**Mean**	**Median**	**St. Dev.**
Assets (m)	484,560	1403.62	116.19	8604.40
ROA	429,502	0.026	0.09	0.40
Debt/equity	480,796	0.75	0.40	1.12
Net equity issuance	429,182	0.24	0.004	0.98
Net debt issuance	431,562	0.04	0	0.22
Tangibility	480,556	0.32	0.27	0.24
Sales growth	376,602	0.08	0.24	0.9

Table 3. Issuance Activity: Leniency Laws

Panel A. Net equity issuance

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is change in common stock over lagged assets, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is the Leniency law dummy. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. Column (7) treats the EU as one country and for EU member countries assumes the passage of a leniency law to be the later of 2002 and the year when the country joined the EU. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Leniency law	0.068***	0.069***	0.065***	0.050***	0.034**	0.037***	0.043**
	3.491	4.024	5.664	5.048	2.354	2.625	2.172
Log assets		0.166***	0.125***	0.174***	0.174***	0.165***	0.166***
		10.452	9.582	11.073	10.801	11.165	10.439
ROA		-1.629***	-1.265***	-1.616***	-1.632***	-1.499***	-1.630***
		-24.786	-15.122	-25.599	-25.442	-13.683	-24.774
Log GDP		-0.252***	-0.168***	-0.233***	-0.258***	-0.238***	-0.257***
		-11.216	-11.788	-13.449	-12.69	-10.226	-11.268
Unemployment rate		0.005**	0	0.005***	-0.001	0.002	0.004*
		2.503	0.014	2.722	-0.465	1.106	1.823
Country imports as % GDP		-0.001*	-0.001**	-0.001***	-0.002***	-0.003***	-0.001*
		-1.713	-2.554	-3.096	-4.633	-4.62	-1.716
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
		4.4	4.478	4.368	4.299	4.404	4.403
Tangibility			-0.497***				
			-8.81				
Sales growth			0.001				
			0.189				
Constant	0.059*	1.796***	1.308***	2.382***	1.989***	1.713***	1.887***
	1.892	10.789	9.929	7.147	7.75	8.972	11.108
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.281	0.298	0.32	0.222	0.465	0.35	0.470
N	461267	351753	351195	351195	349815	228451	349815

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Net debt issuance

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is change in financial debt over lagged assets, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is the Leniency law dummy. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. Column (7) treats EU as one country and for EU member countries assumes the passage of a leniency law to be the later than 2002 and the year when the country joined the EU. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Leniency law	0.007***	0.005**	0.004*	0.003	0.002	0.003	0.004
	3.461	2.186	1.689	1.252	0.686	1.416	1.616
Log assets		0.036***	0.047***	0.037***	0.036***	0.041***	0.036***
		11.676	16.105	11.709	11.287	16.227	11.67
ROA		-0.075***	-0.064***	-0.075***	-0.075***	-0.019**	-0.075***
		-7.962	-5.127	-8.091	-8.176	-2.451	-7.977
Log GDP		-0.041***	-0.045***	-0.036***	-0.047***	-0.046***	-0.041***
		-9.358	-10.397	-8.662	-11.447	-11.295	-9.396
Unemployment rate		-0.004***	-0.003***	-0.004***	-0.004***	-0.003***	-0.004***
		-8.117	-6.032	-7.488	-6.792	-7.228	-8.296
Country imports as % GDP		0.000***	0.000***	0.000**	0.000***	0.000***	0.000***
		4.07	3.952	2.387	4.042	3.75	4.081
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
		4.483	4.551	4.49	4.509	4.468	4.484
Tangibility			0.034***				
			3.841				
Sales growth			-0.001				
			-1.605				
Constant	0.020***	0.262***	0.225***	0.209**	0.364***	0.252***	0.266***
	4.984	6.762	5.501	2.271	6.021	6.553	6.914
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.085	0.103	0.098	0.108	0.106	0.089	0.103
N	416110	351952	301223	351952	351952	228733	351952

* p<0.10, ** p<0.05, *** p<0.01

Table 4. Issuance Activity: Export Market Laws (in Other Countries)

Panel A. Net equity issuance

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is change in common stock over lagged assets, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. In Column (7) the main variable of interest is instead a continuous variable of firm subsidiary location-weighted laws passed in other countries. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Export market leniency laws	0.081***	0.110***	0.109***	0.092***	0.045***	0.047***	
	4.343	4.992	4.644	5.509	2.967	3.442	
Subsidiary-based leniency laws							0.112***
							4.837
Log assets		0.175***	0.119***	0.177***	0.183***	0.146***	0.125***
		6.521	5.653	6.336	6.625	8.053	5.957
ROA		-1.661***	-1.313***	-1.661***	-1.667***	-1.300***	-1.375***
		-12.846	-9.858	-13.467	-13.232	-8.98	-7.101
Log GDP		-0.271***	-0.179***	-0.236***	-0.287***	-0.230***	-0.176***
		-9.367	-8.873	-9.78	-8.906	-9.555	-5.781
Unemployment rate		0.007**	0.001	0.006**	-0.001	0.003*	-0.003
		2.513	0.646	2.476	-0.52	1.709	-1.001
Country imports as % GDP		-0.001	-0.001*	-0.001	-0.002***	-0.002***	0
		-1.133	-1.778	-1.345	-3.474	-4.399	0.45
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
		59.287	82.635	58.126	60.807	59.745	105.832
Tangibility			-0.672***				
			-6.281				
Sales growth			0.012				
			1.623				
Constant	0.045	1.862***	1.403***	1.786***	1.451***	1.643***	1.172***
	1.413	10.047	8.336	3.591	5.637	9.379	4.072
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.294	0.479	0.428	0.483	0.484	0.316	0.528
N	188938	153829	134774	153829	153829	98701	72606

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Net debt issuance

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is change in financial debt over lagged assets, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. In Column (7) the main variable of interest is instead a continuous variable of firm subsidiary location-weighted laws passed in other countries. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Export market leniency laws	0.010***	0.006*	0.005	0.007*	0.004	0.002	
	3.039	1.955	1.597	1.93	0.911	0.448	
Subsidiary-based leniency laws							0.012**
							2.484
Log assets		0.035***	0.046***	0.036***	0.035***	0.047***	0.055***
		8.654	13.322	8.329	8.35	15.495	13.218
ROA		-0.064***	-0.057***	-0.065***	-0.065***	0.003	0.014
		-8.33	-4.133	-8.372	-8.507	0.254	0.715
Log GDP		-0.042***	-0.047***	-0.036***	-0.050***	-0.054***	-0.052***
		-6.669	-7.756	-5.878	-8.426	-10.355	-4.581
Unemployment rate		-0.004***	-0.003***	-0.004***	-0.004***	-0.003***	-0.003**
		-7.822	-5.988	-6.835	-5.749	-5.728	-2.464
Country imports as % GDP		0.001***	0.001***	0.000***	0.001***	0.001***	0.001***
		4.109	3.75	2.789	4.133	3.668	3.444
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
		57.902	86.714	54.386	52.016	59.279	93.875
Tangibility			0.043***				
			4.066				
Sales growth			-0.002*				
			-1.952				
Constant	0.017***	0.263***	0.232***	0.301**	0.368***	0.282***	0.191
	2.988	4.654	3.782	2.069	4.151	5.449	1.636
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.073	0.086	0.084	0.088	0.09	0.089	0.131
N	189550	154250	134944	154250	154250	98660	72794

* p<0.10, ** p<0.05, *** p<0.01

Table 5. Debt-Equity Ratio

Panel A. Leniency law

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is book debt to book equity ratio, limited to between 0 and 9. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is the Leniency law dummy. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. Column (7) treats the EU as one country and for EU member countries assumes the passage of leniency law to be the later of 2002 and the year when the country joined the EU. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Leniency law	-0.030***	-0.046***	-0.056***	-0.027**	-0.039***	-0.024*	-0.032**
	-2.735	-3.669	-4.085	-2.307	-3.268	-1.941	-2.459
Log assets		0.132***	0.161***	0.134***	0.128***	0.156***	0.132***
		11.415	12.033	11.283	10.79	13.872	11.42
ROA		-0.109***	-0.248***	-0.108***	-0.107***	-0.181***	-0.109***
		-4.33	-5.53	-4.67	-4.29	-6.346	-4.313
Log GDP		0.169***	0.192***	0.141***	0.206***	0.175***	0.172***
		6.343	6.697	5.079	6.449	5.8	6.409
Unemployment rate		-0.005*	-0.003	-0.004	0.002	-0.003	-0.004
		-1.764	-1.082	-1.497	0.5	-1.181	-1.439
Country imports as % GDP		0.001	0.001*	0	0.002**	0.001	0.001
		0.946	1.707	0.381	2.511	1.625	0.952
Exchange rate change		-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
		-7.18	-8.674	-3.567	-3.313	-5.596	-7.078
Tangibility			0.617***				
			11.258				
Sales growth			-0.010***				
			-2.943				
Constant	0.826***	-1.768***	-2.340***	-0.805	-2.614***	-1.980***	-1.818***
	39.83	-6.103	-7.451	-1.543	-6.28	-6.302	-6.249
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.511	0.545	0.309	0.3	0.299	0.564	0.545
N	427199	325959	301122	351753	351753	219001	325959

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Export market laws (in other countries)

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is book debt to book equity ratio, limited to between 0 and 9. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. Column (3) clusters standard errors at the firm level. Column (4) controls for lagged leverage. Column (5) reports an OLS regression without firm fixed effects but controlling for lagged leverage. Column (6) restricts the sample to non-U.S. firms. In Column (7) the main variable of interest is instead a continuous variable of firm subsidiary location-weighted laws passed in other countries. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Export market leniency laws	-0.074***	-0.089***	-0.093***	-0.061***	-0.059**	-0.034	
	-3.397	-3.367	-3.3	-2.611	-2.076	-1.241	
Subsidiary-based leniency laws							-0.084***
							-2.584
Log assets		0.106***	0.140***	0.111***	0.102***	0.129***	0.106***
		7.858	8.816	7.532	7.145	8.329	5.476
ROA		-0.136***	-0.278***	-0.134***	-0.134***	-0.286***	-0.267***
		-2.951	-4.574	-3.058	-2.988	-4.928	-3.538
Log GDP		0.190***	0.210***	0.167***	0.224***	0.188***	0.381***
		6.141	6.716	5.267	5.799	5.322	4.37
Unemployment rate		-0.010***	-0.007**	-0.009***	0.001	-0.007*	0.002
		-2.868	-1.976	-2.596	0.209	-1.736	0.324
Country imports as % GDP		0	0.001	0	0.001	0.001	0.002
		0.109	0.78	-0.215	1.138	0.832	0.958
Exchange rate change		-0.000***	-0.000***	-0.000***	-0.000**	-0.000***	0
		-10.534	-9.37	-4.397	-2.442	-8.041	0.89
Tangibility			0.677***				
			10.385				
Sales growth			-0.014***				
			-3.796				
Constant	0.797***	-1.773***	-2.367***	-0.985	-2.554***	-1.881***	-4.108***
	30.545	-5.389	-7.101	-1.192	-4.808	-5.383	-4.125
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.49	0.517	0.54	0.52	0.519	0.536	0.619
N	195102	143647	126508	143647	143647	95104	69324

* p<0.10, ** p<0.05, *** p<0.01

Table 6. Asset Growth

Panel A. Leniency law

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is annual asset growth, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is the Leniency law dummy. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. Column (7) treats the EU as one country and for EU member countries assumes the passage of leniency law to be the later of 2002 and the year when the country joined the EU. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Leniency law	0.067***	0.082***	0.074***	0.048***	0.029*	0.027	0.063***
	3.648	4.167	5.791	4.179	1.674	1.533	2.92
Log assets		0.310***	0.285***	0.324***	0.320***	0.291***	0.309***
		18.005	19.803	18.855	18.385	17.992	17.997
ROA		-1.068***	-0.539***	-1.054***	-1.072***	-0.997***	-1.069***
		-14.695	-5.905	-15.338	-15.187	-8.194	-14.696
Log GDP		-0.353***	-0.272***	-0.321***	-0.356***	-0.331***	-0.357***
		-13.557	-14.45	-16.213	-14.343	-11.87	-13.52
Unemployment rate		0.005	-0.001	0.003	-0.005	0.002	0.003
		1.615	-0.345	1.129	-1.408	0.929	1.204
Country imports as % GDP		0	0	-0.001	-0.002***	-0.002***	0
		-0.549	-0.548	-1.53	-3.202	-3.22	-0.54
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
		4.651	4.711	4.542	4.49	4.611	4.656
Tangibility			-0.680***				
			-9.997				
Sales growth			-0.017***				
			-2.705				
Constant	0.031	2.004***	1.487***	2.247***	2.576***	1.954***	2.079***
	1.003	9.324	8.383	5.869	8.653	8.184	9.492
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.136	0.258	0.181	0.277	0.268	0.228	0.258
N	418101	352968	302015	352968	352968	229190	352968

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Export market laws (in other countries)

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is annual asset growth, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. In Column (7) the main variable of interest is instead a continuous variable of firm subsidiary location-weighted laws passed in other countries. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Export market leniency laws	0.098***	0.142***	0.129***	0.110***	0.049***	0.044**	
	4.792	5.139	4.659	5.697	2.623	2.337	
Subsidiary-based leniency laws							0.139***
							5.521
Log assets		0.327***	0.283***	0.331***	0.338***	0.273***	0.267***
		9.161	11.031	8.87	9.153	14.215	11.723
ROA		-1.016***	-0.524***	-1.017***	-1.023***	-0.746***	-0.578***
		-6.836	-3.444	-7.148	-7.035	-4.924	-2.778
Log GDP		-0.369***	-0.277***	-0.318***	-0.385***	-0.319***	-0.275***
		-10.564	-11.164	-10.712	-8.997	-11.42	-7.206
Unemployment rate		0.006	0	0.004	-0.004	0.003	-0.002
		1.626	0.195	1.265	-1.573	1.327	-0.591
Country imports as % GDP		0	0	0	-0.002**	-0.002**	0.002*
		0.261	0.196	0.408	-1.974	-2.086	1.925
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
		58.617	77.901	56.911	53.665	59.553	91.784
Tangibility			-0.869***				
			-7.825				
Sales growth			-0.012				
			-1.427				
Constant	0.401***	1.958***	1.496***	1.991***	2.235***	1.792***	1.196***
	6.039	8.515	7.264	3.415	5.339	7.958	2.979
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.105	0.234	0.175	0.243	0.244	0.179	0.32
N	190263	154584	135210	154584	154584	98823	73055

* p<0.10, ** p<0.05, *** p<0.01

Table 7. Financing Deficit

Panel A. Leniency law

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is the financing deficit defined as the difference between a firm's requirement for funds (due to investment and dividend payments) and internally generated funds, and is identically equal to the sum of net issue of debt plus net issue of equity, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is the Leniency law dummy. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. Column (7) treats the EU as one country and for EU member countries assumes the passage of leniency law to be the later of 2002 and the year when the country joined the EU. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Leniency law	0.080***	0.078***	0.071***	0.054***	0.035**	0.042**	0.049**
	3.798	4.364	6.05	4.878	2.183	2.566	2.433
Log assets		0.221***	0.187***	0.232***	0.229***	0.225***	0.220***
		13.919	15.277	14.818	14.045	14.668	13.917
ROA		-1.909***	-1.461***	-1.895***	-1.913***	-1.702***	-1.909***
		-26.141	-14.996	-27.019	-26.824	-13.776	-26.134
Log GDP		-0.319***	-0.230***	-0.293***	-0.326***	-0.304***	-0.324***
		-12.89	-14.1	-15.062	-13.918	-11.305	-12.949
Unemployment rate		0.002	-0.003	0.002	-0.006*	-0.001	0
		0.893	-1.537	0.791	-1.756	-0.281	0.126
Country imports as % GDP		0	-0.001	-0.001**	-0.001***	-0.002***	0
		-0.781	-1.212	-2.13	-2.98	-3.249	-0.798
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
		4.412	4.494	4.37	4.31	4.416	4.415
Tangibility			-0.487***				
			-7.593				
Sales growth			-0.003				
			-0.481				
Constant	0.092***	2.233***	1.629***	2.644***	2.465***	2.075***	2.334***
	2.647	11.15	9.88	6.844	8.134	9.041	11.486
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.275	0.463	0.386	0.472	0.468	0.357	0.463
N	412180	348988	299227	348988	348988	228423	348988

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Export market laws in other countries

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is the financing deficit defined as the difference between a firm's requirement for funds (due to investment and dividend payments) and internally generated funds, and is identically equal to the sum of net issue of debt plus net issue of equity, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. In Column (7) the main variable of interest is instead a continuous variable of firm subsidiary location-weighted laws passed in other countries. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Export market leniency laws	0.096***	0.127***	0.120***	0.110***	0.052***	0.057***	
	4.699	5.337	4.715	6.038	2.8	3.353	
Subsidiary-based leniency laws							0.135***
							5.197
Log assets		0.233***	0.179***	0.236***	0.242***	0.208***	0.203***
		8.218	8.477	7.961	8.287	10.785	8.452
ROA		-1.921***	-1.494***	-1.922***	-1.928***	-1.442***	-1.487***
		-12.946	-10.055	-13.521	-13.314	-8.767	-6.963
Log GDP		-0.343***	-0.242***	-0.299***	-0.366***	-0.301***	-0.261***
		-10.856	-10.997	-11.22	-10.078	-11.26	-6.936
Unemployment rate		0.004	-0.002	0.003	-0.004*	0	-0.006
		1.2	-0.645	1.029	-1.657	0.223	-1.576
Country imports as % GDP		0	0	0	-0.001*	-0.001**	0.002*
		0.239	0.032	-0.011	-1.668	-2.13	1.821
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
		59.844	84.383	58.688	58.235	60.337	104.5
Tangibility			-0.648***				
			-5.861				
Sales growth			0.008				
			0.962				
Constant	0.074**	2.299***	1.721***	2.457***	1.924***	1.996***	1.565***
	2.197	10.346	8.323	4.518	6.049	9.608	4.149
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.291	0.485	0.42	0.49	0.491	0.307	0.512
N	188453	153535	134526	153535	153535	98569	72361

* p<0.10, ** p<0.05, *** p<0.01

Table 8. Heterogeneity

Panel A. Predicted convictions

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions. Columns (1)-(2) report the results, where the dependent variable is change in common stock over lagged assets, winsorized at 1%; Columns (3)-(4) report the results where the dependent variable is change in financial debt over lagged assets, winsorized at 1%; Columns (5)-(6) report the results where the dependent variable is book debt to book equity ratio, limited to between 0 and 9; Columns (7)-(8) report the results where the dependent variable is annual asset growth, winsorized at 1% and Columns (9)-(10) report the results where the dependent variable is net issue of debt plus net issue of equity, winsorized at 1%. All regressions include firm fixed effects and time fixed effects, and controls such as log assets, ROA, log GDP, unemployment rate, country imports as % of GDP, and exchange rate change. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is the interaction between the passage of the leniency laws and the likelihood that the market is cartelized. We use a prediction model based on time-varying firm characteristics (asset size, leverage and ROA), country characteristics (GDP and unemployment), as well country fixed effects and three-digit SIC fixed effects. We fit the prediction model only by using pre-leniency observations and predict the probability that the firm will be convicted in the cartel case in the year after the passage of the leniency law. In Columns (1), (3), (5), (7), and (9), our main variable of interest is the interaction term between the passage of the leniency law and the predicted conviction probability. In Columns (2), (4), (6), (8), and (10), our main variable of interest is the interaction term between a continuous variable of country-SIC3 export-weighted laws passed in other countries and the predicted conviction probability. *, **, and *** denote significance at the 10%, 5%, and 1%.

	Equity Issuance		**Debt Issuance**		**Debt-Equity Ratio**		**Asset Growth**		**Financing Deficit**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Leniency law	0.064***		0.005**		-0.043***		0.073***		0.077***	
	3.737		2.188		-3.364		4.078		3.911	
Export market leniency laws		0.107***		0.007**		-0.084***		0.125***		0.141***
		4.903		2.148		-3.159		5.302		5.125
Leniency law*Predicted conviction	0.420***		0.002		-0.617*		0.433***		0.443***	
	4.501		0.1		-1.823		3.925		3.459	
Export market leniency laws*Predicted conviction		0.443***		-0.082**		-0.523		0.336**		0.17
		3.236		-2.385		-1.336		2.121		0.972
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.448	0.475	0.102	0.085	0.545	0.518	0.451	0.482	0.247	0.233
N	345859	153503	348070	153956	322351	143402	345140	153246	349027	154276

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Higher Profitability

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions. Columns (1)-(2) report the results, where the dependent variable is change in common stock over lagged assets, winsorized at 1%; Columns (3)-(4) report the results where the dependent variable is change in financial debt over lagged assets, winsorized at 1%; Columns (5)-(6) report the results where the dependent variable is book debt to book equity ratio, limited to between 0 and 9; Columns (7)-(8) report the results where the dependent variable is annual asset growth, winsorized at 1% and Columns (9)-(10) report the results where the dependent variable is net issue of debt plus net issue of equity, winsorized at 1%. All regressions include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is the interaction between the passage of the leniency laws and a dummy variable if the firm's profitability is higher than the median profitability in its country and industry in a specific year. In Columns (1), (3), (5), (7), and (9), our main variable of interest is the interaction term between the passage of the leniency law and the profitability dummy. In Columns (2), (4), (6), (8), and (10), our main variable of interest is the interaction term between a continuous variable of country-SIC3 export-weighted laws passed in other countries and the profitability dummy. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	Equity Issuance		**Debt Issuance**		**Debt-Equity Ratio**		**Asset Growth**		**Financing Deficit**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Leniency law	0.052***		0.004		-0.029**		0.062***		0.055***	
	3.335		1.624		-2.061		3.324		3.404	
Export market leniency laws		0.085***		0.007*		-0.061**		0.117***		0.099***
		4.193		1.832		-2.073		3.97		4.157
Leniency law*Higher profitability	0.036**		0.002		-0.037***		0.041***		0.048***	
	2.569		0.814		-3.662		2.612		3.04	
Export market leniency laws* Higher profitability		0.058***		-0.001		-0.061***		0.057***		0.067***
		2.979		-0.232		-3.363		2.702		3.309
Higher profitability	0.237***	0.221***	0.034***	0.026***	-0.094***	-0.087***	0.323***	0.282***	0.301***	0.273***
	20.619	15.376	14.966	9.709	-11.563	-7.588	22.531	15.322	22.048	15.285
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.469	0.489	0.106	0.089	0.546	0.519	0.277	0.256	0.474	0.498
N	349815	153829	351952	154250	325959	143647	352968	154584	348988	153535

* p<0.10, ** p<0.05, *** p<0.01

Panel C. Top 10% Largest Firms

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions. Columns (1)-(2) report the results, where the dependent variable is change in common stock over lagged assets, winsorized at 1%; Columns (3)-(4) report the results where the dependent variable is change in financial debt over lagged assets, winsorized at 1%; Columns (5)-(6) report the results where the dependent variable is book debt to book equity ratio, limited to between 0 and 9; Columns (7)-(8) report the results where the dependent variable is annual asset growth, winsorized at 1% and Columns (9)-(10) report the results where the dependent variable is net issue of debt plus net issue of equity, winsorized at 1%. All regressions include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is the interaction between the passage of the leniency laws and a dummy variable if the firm's asset size is higher than the 90% percentile in terms of asset size in its country and industry in a specific year. In Columns (1), (3), (5), (7), and (9), our main variable of interest is the interaction term between the passage of the leniency law and the size dummy. In Columns (2), (4), (6), (8), and (10), our main variable of interest is the interaction term between a continuous variable of country-SIC3 export-weighted laws passed in other countries and the size dummy. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	Equity Issuance		**Debt Issuance**		**Debt-Equity Ratio**		**Asset Growth**		**Financing Deficit**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**
Leniency law	0.063***		0.010***		-0.042***		0.085***		0.078***	
	3.272		4.263		-3.263		3.842		3.891	
Export market leniency laws		0.088***		0.013***		-0.089***		0.129***		0.113***
		4.525		3.827		-3.482		5.151		5.255
Leniency law*Top 10% largest size	0.025**		-0.017***		-0.014		-0.002		0.005	
	2.186		-7.426		-0.876		-0.186		0.384	
Export market leniency laws*Top 10% largest size		0.079***		-0.023***		0.001		0.048**		0.053**
		3.559		-5.458		0.028		2.192		2.38
Top 10% largest size	-0.100***	-0.086***	-0.001	0.008**	0.024	0.017	-0.146***	-0.119***	-0.105***	-0.085***
	-5.826	-3.43	-0.397	2.345	1.634	0.707	-6.647	-3.658	-5.535	-3.017
Controls	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.46	0.479	0.103	0.087	0.545	0.517	0.259	0.234	0.463	0.486
N	349815	153829	351952	154250	325959	143647	352968	154584	348988	153535

* p<0.10, ** p<0.05, *** p<0.01

Table 9. Robustness Tests

Panel A. Issuance activity

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where in Columns (1)-(4) the dependent variable is change in common stock over lagged assets, winsorized at 1%, and in Columns (5)-(8) the dependent variable is change in financial debt over lagged assets, winsorized at 1%. All regressions include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is the Leniency law dummy. Columns (1) and (5) control for other law changes such as the introduction of competition law; the change in corporate governance law and Chinn-Ito index of country's degree of capital account openness. Columns (2) and (6) control for HHI in firm's SIC3 industry in its country. Columns (3) and (7) control for log imports to a firm's SIC3 industry in its country. In Columns (4) and (8), we control for other forms of strengthening anti-cartel legislation. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	Net Equity Issuance				Net Debt Issuance			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Leniency law	0.038*	0.070***	0.063***	0.072***	0.003	0.005**	0.001	0.006**
	1.851	4.022	4.238	3.729	1.296	2.237	0.486	2.303
Log assets	0.198***	0.166***	0.177***	0.178***	0.046***	0.036***	0.035***	0.033***
	10.781	10.447	6.382	10.651	11.75	11.67	8.404	10.411
ROA	-1.623***	-1.629***	-1.666***	-1.689***	-0.074***	-0.075***	-0.064***	-0.079***
	-23.24	-24.781	-13.109	-28.093	-7.723	-7.957	-8.275	-8.832
Log GDP	-0.315***	-0.251***	-0.262***	-0.345***	-0.055***	-0.041***	-0.049***	-0.044***
	-13.288	-11.316	-10.311	-6.422	-9.466	-9.29	-8.585	-5.075
Unemployment rate	0.011***	0.005**	0.006**	0.004	-0.004***	-0.004***	-0.004***	-0.003***
	3.657	2.531	2.453	1.481	-7.597	-8.109	-7.876	-4.404
Country imports as % GDP	-0.002**	-0.001*	-0.001*	0.003***	0.001***	0.000***	0.001***	0.001***
	-2.236	-1.657	-1.702	2.658	3.509	4.122	4.083	5.579
Exchange rate change	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	4.355	4.404	63.092	4.476	4.388	4.489	61.63	4.541
Competition law	0.040*				-0.027***			
	1.86				-3.965			
Capital account openness	0.069				-0.007			
	1.359				-0.754			
Corporate governance reform	-0.011				0.005*			
	-0.712				1.816			
HHI		0.043				0.014**		
		1.317				2.404		
Log industry-country imports			-0.022				0.008**	
			-0.461				2.104	
Increase in penalties				-0.088***				0
				-4.394				-0.097
Change in investigative powers				0.016				-0.005**
				1.086				-1.968
Change in cartel definitions				-0.017				0.003
				-0.465				0.588
Other cartel laws				-0.015				0
				-0.283				0.008
Constant	2.210***	1.764***	2.195***	2.777***	0.379***	0.251***	0.200***	0.289***
	13.683	10.74	4.044	5.447	7.823	6.489	2.589	3.47
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.475	0.459	0.479	0.481	0.121	0.103	0.083	0.107
N	284753	349815	151782	293768	286647	351952	152204	295979

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Debt-equity ratio

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is book debt to book equity ratio, limited to between 0 and 9. All regressions include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is the Leniency law dummy. Column (1) controls for other law changes such as the introduction of competition law; the change in corporate governance law and Chinn-Ito index of country's degree of capital account openness. Column (2) controls for HHI in firm's SIC3 industry in its country. Column (3) controls for log imports to firm's SIC3 industry in its country. In Column (4), we control for other forms of strengthening anti-cartel legislation. Column (5) controls for lagged leverage. Column (6) reports an OLS regression without firm fixed effects but controlling for lagged leverage. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Leniency law	-0.049***	-0.045***	-0.054***	-0.047***	-0.030***	-0.034**
	-3.878	-3.618	-3.148	-3.287	-3.888	-2.503
Log assets	0.130***	0.132***	0.107***	0.121***	0.114***	0.178***
	9.584	11.433	7.789	10.081	13.405	13.197
ROA	-0.098***	-0.109***	-0.129***	-0.087***	-0.170***	-0.252***
	-3.604	-4.336	-2.933	-3.866	-6.837	-5.066
Log GDP	0.142***	0.172***	0.240***	0.216***	0.067***	0.185***
	4.969	6.47	6.005	5.749	4.264	6.041
Unemployment rate	-0.014***	-0.004*	-0.009***	-0.004	-0.012***	-0.002
	-3.996	-1.728	-2.614	-1.254	-6.643	-0.499
Country imports as % GDP	0.002**	0.001	0	-0.003*	0.001***	0.001*
	2.284	1.013	0.194	-1.715	3.077	1.893
Exchange rate change	0	-0.000***	-0.000***	-0.000***	-0.000**	-0.000***
	-0.84	-6.674	-9.577	-6.471	-1.999	-4.593
Competition law	-0.01					
	-0.285					
Capital account openness	-0.208***					
	-3.472					
Corporate governance reform	0.026*					
	1.781					
HHI		0.083***				
		2.584				
Log industry-country imports			-0.05			
			-1.508			
Increase in penalties				-0.007		
				-0.478		
Change in investigative powers				0.012		
				0.765		
Change in cartel definitions				0.059**		
				2.508		
Other cartel laws				-0.056*		
				-1.687		
Lagged leverage					0.466***	0.750***
					44.51	202.734
Constant	-1.250***	-1.830***	-1.495***	-2.186***	-0.911***	0.128***
	-4.161	-6.328	-3.592	-5.247	-5.605	7.918
Firm fixed effects	Y	Y	Y	Y	Y	N
Time fixed effects	Y	Y	Y	Y	Y	Y
R-squared	0.569	0.545	0.52	0.555	0.656	0.58
N	264810	325959	141841	272349	317100	317100

* p<0.10, ** p<0.05, *** p<0.01

Panel C. Asset growth and financing deficit

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where in Columns (1)-(4) the dependent variable is annual asset growth, winsorized at 1%, and in Columns (5)-(8) the dependent variable is net issue of debt plus net issue of equity, winsorized at 1%. All regressions include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is the Leniency law dummy. Columns (1) and (5) control for other law changes such as the introduction of competition law; the change in corporate governance law and Chinn-Ito index of country's degree of capital account openness. Columns (2) and (6) control for HHI in firm's SIC3 industry in its country. Columns (3) and (7) control for log imports to a firm's SIC3 industry in its country. In Columns (4) and (8), we control for other forms of strengthening anti-cartel legislation. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	Asset Growth				Financing Deficit			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Leniency law	0.040*	0.083***	0.072***	0.084***	0.043**	0.079***	0.067***	0.082***
	1.756	4.192	3.858	3.95	2.023	4.381	4.058	4.13
Log assets	0.360***	0.310***	0.329***	0.325***	0.268***	0.221***	0.237***	0.231***
	21.135	18.01	8.956	17.948	16.235	13.919	8.154	13.522
ROA	-1.075***	-1.068***	-1.019***	-1.133***	-1.898***	-1.909***	-1.926***	-1.977***
	-13.537	-14.691	-6.964	-17.274	-23.867	-26.134	-13.186	-30.202
Log GDP	-0.459***	-0.350***	-0.358***	-0.538***	-0.412***	-0.317***	-0.346***	-0.428***
	-17.676	-13.64	-11.58	-8.867	-16.458	-12.946	-11.93	-7.558
Unemployment rate	0.012***	0.005*	0.004	0.002	0.008**	0.002	0.003	0.002
	3.253	1.651	1.31	0.635	2.312	0.923	0.965	0.564
Country imports as % GDP	-0.001	0	0	0.005***	-0.001	0	0	0.005***
	-0.866	-0.484	-0.139	3.191	-1.56	-0.716	-0.175	3.449
Exchange rate change	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	4.612	4.659	61.956	4.748	4.354	4.417	63.78	4.481
Competition law	0.049*				0.024			
	1.909				0.958			
Capital account openness	0.062				0.086			
	1.014				1.532			
Corporate governance reform	-0.009				-0.003			
	-0.568				-0.194			
HHI		0.079**				0.066*		
		1.985				1.81		
Log industry-country imports			-0.029				-0.014	
			-0.527				-0.28	
Increase in penalties				-0.106***				-0.095***
				-4.266				-4.656
Change in investigative powers				0.001				0.015
				0.056				0.86
Change in cartel definitions				0.015				-0.018
				0.335				-0.451
Other cartel laws				-0.023				-0.009
				-0.351				-0.161
Constant	2.756***	1.945***	2.422***	3.956***	2.865***	2.184***	2.621***	3.377***
	12.78	9.165	3.946	6.61	14.523	10.992	4.6	6.126
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.296	0.258	0.235	0.28	0.48	0.463	0.487	0.487
N	287324	352968	152551	296867	284168	348988	151489	293047

* p<0.10, ** p<0.05, *** p<0.01

Table 10. Large Issuance Activity

Panel A. Probits of large equity changes

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports marginal effects of probit regressions, where the dependent variable is a dummy if net change in common stock over lagged assets is greater than 5% (in Columns 1-2) or a dummy if net change in common stock over lagged assets is less than -1.25% (in Columns 3-4). All regressions include time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

In Columns (1) and (3), our main variable of interest is the Leniency law dummy. In Columns (2) and (4), our main continuous variable of country-SIC3 export-weighted laws passed in other countries. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**
Leniency law	0.134***		0	
	10.432		-0.127	
Export market leniency laws		0.182***		0
		5.65		-0.023
Log assets	-0.031***	-0.029***	0	0
	-13.116	-9.423	0.128	0.023
ROA	-0.220***	-0.306***	0	0
	-12.077	-6.233	0.128	0.023
Log GDP	-0.014***	-0.026***	0	0
	-3.493	-4.892	0.128	0.023
Unemployment rate	0.008***	0.012***	0	0
	7.072	6.895	0.128	0.023
Country imports as % GDP	0.000***	0.000**	0	0
	4.143	2.433	0.128	0.023
Exchange rate change	0.068***	0.017	0	0
	65.905	1.211	-0.13	-0.024
Time fixed effects	Y	Y	Y	Y
N	349815	153829	349815	153829

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Probits of large debt changes

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports marginal effects of probit regressions, where the dependent variable is a dummy if net change in financial debt over lagged assets is greater than 5% (in Columns 1-2) or a dummy if net change in financial debt over lagged assets is less than -5% (in Columns 3-4). All regressions include time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

In Columns (1) and (3), our main variable of interest is the Leniency law dummy. In Columns (2) and (4), our main continuous variable of country-SIC3 export-weighted laws passed in other countries. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**
Leniency law	0.075***		0.008**	
	10.703		2.126	
Export market leniency laws		0.110***		0.018**
		10.203		2.461
Log assets	0.009***	0.006***	-0.010***	-0.010***
	7.526	5.536	-9.692	-6.258
ROA	-0.058***	-0.070***	-0.001	0
	-6.941	-9.486	-0.17	0.126
Log GDP	-0.052***	-0.063***	0.002	0.002
	-27.274	-15.254	1.176	0.958
Unemployment rate	0.001*	0.002***	0.002***	0.003***
	1.701	3.272	4.829	4.82
Country imports as % GDP	0.001***	0.001***	0.000***	0.000***
	10.031	8.118	3.339	3.471
Exchange rate change	0	0.004	0	-0.002
	1.423	1.294	-0.431	-0.802
Time fixed effects	Y	Y	Y	Y
N	351952	154250	351952	154250

* p<0.10, ** p<0.05, *** p<0.01

Table 11. Dynamics

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions. Column (1) reports the results, where the dependent variable is change in common stock over lagged assets, winsorized at 1%; Column (2) reports the results where the dependent variable is change in financial debt over lagged assets, winsorized at 1%; Column (3) report the results where the dependent variable is book debt to book equity ratio, limited to between 0 and 9, Column (4) reports the results where the dependent variable is annual asset growth, winsorized at 1%, and Column (5) reportd the results where the dependent variable is net issue of debt plus net issue of equity, winsorized at 1%. All regressions include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variables of interest are the dummy variable of whether the leniency law was passed in the last two years, whether it was passed 3-4 years ago, 5-6 years ago, or earlier. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	Equity Issuance	**Debt Issuance**	**Debt-Equity Ratio**	**Asset Growth**	**Financing Deficit**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Leniency law (years 1-2)	0.032**	0.003	-0.042***	0.036**	0.035**
	2.209	1.331	-3.435	2.255	2.253
Leniency law (years 3-4)	0.055***	0.004*	-0.039**	0.058**	0.061***
	2.686	1.686	-2.419	2.512	2.857
Leniency law (years 5-6)	-0.023	0.011***	-0.036*	-0.021	-0.019
	-1.331	3.507	-1.827	-1.001	-0.995
Leniency law (years 7+)	-0.128***	0.003	-0.015	-0.161***	-0.144***
	-5.85	0.829	-0.603	-6.58	-5.947
Log assets	0.169***	0.036***	0.132***	0.313***	0.224***
	10.528	11.561	11.452	18.07	13.919
ROA	-1.630***	-0.075***	-0.109***	-1.069***	-1.910***
	-24.926	-7.959	-4.33	-14.786	-26.272
Log GDP	-0.206***	-0.040***	0.163***	-0.297***	-0.267***
	-12.175	-9.943	6.067	-14.936	-13.74
Unemployment rate	-0.001	-0.004***	-0.004	-0.003	-0.005**
	-0.58	-7.127	-1.322	-1.24	-1.988
Country imports as % GDP	-0.002***	0.000***	0.001	-0.002**	-0.002***
	-3.81	4.093	1.14	-2.412	-2.789
Exchange rate change	0.000***	0.000***	-0.000***	0.000***	0.000***
	4.421	4.483	-7.282	4.681	4.433
Constant	1.552***	0.250***	-1.740***	1.702***	1.951***
	10.68	6.685	-5.966	9.018	10.835
Firm fixed effects	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y
R-squared	0.461	0.103	0.545	0.26	0.464
N	349815	351952	325959	352968	348988

* p<0.10, ** p<0.05, *** p<0.01

Table 12. Actual Convictions

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions. Column (1) reports the results, where the dependent variable is change in common stock over lagged assets, winsorized at 1%; Column (2) reports the results where the dependent variable is change in financial debt over lagged assets, winsorized at 1%; Column (3) report the results where the dependent variable is book debt to book equity ratio, limited to between 0 and 9, Column (4) reports the results where the dependent variable is annual asset growth, winsorized at 1%, and Column (5) reportd the results where the dependent variable is net issue of debt plus net issue of equity, winsorized at 1%. All regressions include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a dummy variable of whether the firm was convicted in a cartel case over the past five years by any antitrust authority around the world. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	Equity Issuance	**Debt Issuance**	**Debt-Equity Ratio**	**Asset Growth**	**Financing Deficit**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Conviction	0.043***	-0.005	-0.024	0.034**	0.039***
	3.888	-1.451	-1.044	2.097	2.981
Log assets	0.165***	0.036***	0.110***	0.309***	0.220***
	10.461	11.728	13.003	18.047	13.961
ROA	-1.629***	-0.075***	-0.072***	-1.068***	-1.909***
	-24.749	-7.962	-4.344	-14.666	-26.102
Log GDP	-0.261***	-0.042***	0.124***	-0.363***	-0.329***
	-11.002	-9.242	6.704	-13.28	-12.714
Unemployment rate	0	-0.004***	-0.002	-0.002	-0.004
	0.111	-8.258	-1.287	-0.519	-1.238
Country imports as % GDP	-0.001*	0.000***	0.001	0	-0.001
	-1.881	4.039	1.191	-0.697	-0.951
Exchange rate change	0.000***	0.000***	-0.000***	0.000***	0.000***
	4.4	4.483	-8.027	4.651	4.412
Constant	2.005***	0.277***	-1.382***	2.249***	2.470***
	10.478	6.925	-6.749	9.346	11.086
Firm fixed effects	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y
R-squared	0.459	0.103	0.605	0.257	0.463
N	349815	351952	315473	352968	348988

* p<0.10, ** p<0.05, *** p<0.01

Capital Structure and Strategic Competition

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This internet appendix provides additional tests.

First, in Table IA1, we report the results on cash holdings. We scale cash holdings by assets, and based on same specifications as in other tests, we find that cash holdings decrease after the passage of leniency laws.

Second, we provide additional robustness checks for the identification based on the Export Market Leniency Law. In particular, we focus on the robustness with respect to degree of competition and other laws, similar to Table 9. Table IA2 reports the results, where Panel A shows the results for issuance activity, Panel B shows the results for leverage specifications, while Panel C reports results for asset growth and financing deficit.

Finally, we provide tests where we limit the sample to non-U.S. firms. In Tables IA3, IA4, and IA5, we replicate the results in Tables 3-5 that provide main results of the paper. We find that most of the results consistently show that, following leniency law passages in non-U.S. as well as export markets of non-U.S. firm, the leverage dropped. In addition, we find that such leverage changes come from equity issuances.

Table IA1. Cash

Panel A. Leniency law

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is cash to assets ratio, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is Leniency law dummy. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3,) we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. Column (7) treats EU as one country and for EU member countries assumes the passage of leniency law to be the latest of 2002 and the year when the country joined EU. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Leniency law	0.001	-0.002	-0.003**	-0.003**	-0.002	-0.001	-0.004**
	0.464	-0.997	-1.988	-2.245	-1.052	-0.582	-2.154
Log assets		-0.018***	-0.019***	-0.018***	-0.019***	-0.016***	-0.018***
		-9.161	-11.254	-10.617	-9.18	-9.298	-9.181
ROA		-0.035***	-0.019***	-0.034***	-0.035***	-0.037***	-0.035***
		-14.408	-4.795	-14.551	-14.979	-7.465	-14.365
Log GDP		0.032***	0.026***	0.028***	0.035***	0.033***	0.032***
		11.365	8.624	10.174	10.749	11.516	11.384
Unemployment rate		0	0	0	-0.001***	-0.001**	0
		-0.506	0.729	-0.359	-2.751	-2.555	-1.143
Country imports as % GDP		0	0	0	0	0	0
		-0.258	-0.631	0.872	1.406	-0.427	-0.302
Exchange rate change		0	0	0	0	0	0
		0.302	0.271	0.328	0.255	0.308	0.299
Tangibility			-0.259***				
			-21.027				
Sales growth			0				
			0.956				
Constant	0.124***	-0.082***	0.056*	-0.09	-0.037	-0.097***	-0.077***
	46.092	-3.071	1.928	-1.149	-0.966	-3.515	-2.913
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.543	0.568	0.616	0.571	0.57	0.591	0.568
N	454993	347228	297226	347228	347228	224389	347228

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Export market laws (in other countries)

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is cash to assets ratio, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3) we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) restricts the sample to non-U.S. firms. In Column (7) the main variable of interest is instead a continuous variable of firm subsidiary location-weighted laws passed in other countries. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Export market leniency laws	-0.006***	-0.007***	-0.008***	-0.007***	-0.003	-0.006**	
	-2.69	-2.911	-3.405	-2.608	-1.217	-2.325	
Subsidiary-based leniency laws							0.006
							1.61
Log assets		-0.009***	-0.013***	-0.010***	-0.010***	-0.007***	-0.023***
		-6.172	-9.117	-6.134	-6.202	-2.659	-5.642
ROA		-0.033***	-0.021***	-0.033***	-0.033***	-0.023***	-0.019**
		-9.254	-3.972	-8.996	-9.131	-4.159	-2.136
Log GDP		0.023***	0.018***	0.021***	0.025***	0.023***	0.053***
		7.198	5.19	6.649	7.156	6.697	7.028
Unemployment rate		0	0	0	0	0	0.003***
		-0.166	0.181	0.041	-0.914	-0.781	4.589
Country imports as % GDP		0	0	0	0	0	0
		-0.52	-0.962	-0.354	0.402	-0.49	-0.85
Exchange rate change		-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	0.000***
		-28.397	-25.45	-8.966	-8.9	-27.014	100.856
Tangibility			-0.286***				
			-15.839				
Sales growth			0.001				
			1.208				
Constant	0.120***	-0.018	0.127***	0.093	-0.028	-0.044	-0.291***
	40.802	-0.592	3.522	0.865	-0.743	-1.358	-3.655
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	N	Y	N	N
R-squared	0.558	0.568	0.604	0.569	0.569	0.601	0.69
N	206489	152362	133291	152362	152362	96933	72132

* p<0.10, ** p<0.05, *** p<0.01

Table IA2. Additional Robustness Checks

Panel A. Issuance activity

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where in Columns (1)-(4) the dependent variable is change in common stock over lagged assets, winsorized at 1%, and in Columns (5)-(8) the dependent variable is change in financial debt over lagged assets, winsorized at 1%. All regressions include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. Columns (1) and (5) control for other law changes such as the introduction of competition law; the change in corporate governance law and Chinn-Ito index of country's degree of capital account openness. Columns (2) and (6) controls for HHI in firm's SIC3 industry in its country. Columns (3) and (7) control for log imports to a firm's SIC3 industry in its country. In Columns (4) and (8), we control for other forms of strengthening anti-cartel legislation. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	Equity Issuance				Debt Issuance			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Export market leniency laws	0.071***	0.110***	0.116***	0.098***	0.002	0.007**	0.005	0.007*
	3.291	4.984	4.705	4.659	0.582	2.034	1.368	1.845
Log assets	0.205***	0.175***	0.178***	0.191***	0.045***	0.035***	0.035***	0.031***
	6.788	6.517	6.385	6.697	8.198	8.645	8.373	7.876
ROA	-1.683***	-1.661***	-1.668***	-1.741***	-0.061***	-0.064***	-0.064***	-0.070***
	-12.041	-12.847	-13.14	-15.266	-6.325	-8.326	-8.244	-10.631
Log GDP	-0.347***	-0.273***	-0.254***	-0.388***	-0.059***	-0.041***	-0.049***	-0.040***
	-10.911	-9.247	-10.172	-6.972	-6.502	-6.496	-8.426	-4.112
Unemployment rate	0.015***	0.007**	0.007***	0.007**	-0.005***	-0.004***	-0.004***	-0.003***
	3.511	2.489	2.669	2.162	-7.856	-7.756	-7.527	-4.765
Country imports as % GDP	-0.001*	-0.001	-0.001	0.004***	0.001***	0.001***	0.001***	0.001***
	-1.794	-1.202	-1.085	3.634	3.875	4.212	4.167	4.378
Exchange rate change	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	69.453	59.333	63.012	141.158	68.527	57.965	61.641	140.022
Competition law	0.062**				-0.031***			
	2.126				-3.294			
Capital account openness	0.130**				-0.001			
	2.347				-0.088			
Corporate governance reform	-0.018				0.005			
	-1.256				1.546			
HHI		-0.041				0.014**		
		-1.284				2.055		
Log industry-country imports			-0.023				0.008**	
			-0.482				2.036	
Increase in penalties				-0.057***				0.001
				-3.207				0.236
Change in investigative powers				-0.013				-0.006
				-0.717				-1.546
Change in cartel definitions				0.047*				-0.003
				1.831				-0.478
Other cartel laws				-0.057				0.005
				-1.238				0.481
Constant	2.358***	1.905***	2.055***	3.069***	0.426***	0.248***	0.192**	0.254***
	11.275	9.869	3.968	6.646	5.483	4.327	2.44	2.76
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.487	0.479	0.479	0.507	0.093	0.086	0.083	0.091
N	126794	153829	150803	126520	127230	154250	151228	126982

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Debt-equity ratio

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is book debt to book equity ratio, limited to between 0 and 9. All regressions include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. Column (1) controls for other law changes such as the introduction of competition law; the change in corporate governance law and Chinn-Ito index of country's degree of capital account openness. Column (2) controls for HHI in firm's SIC3 industry in its country. Column (3) controls for log imports to firm's SIC3 industry in its country. In Column (4), we control for other forms of strengthening anti-cartel legislation. Column (5) controls for lagged leverage. Column (6) reports an OLS regression without firm fixed effects but controlling for lagged leverage. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Export market leniency laws	-0.082***	-0.087***	-0.092***	-0.087***	-0.049***	-0.017**
	-3.109	-3.294	-3.289	-3.077	-3.169	-2.245
Log assets	0.111***	0.106***	0.108***	0.098***	0.098***	0.029***
	7.507	7.834	7.716	6.808	7.625	23.282
ROA	-0.127***	-0.136***	-0.128***	-0.103***	-0.216***	-0.135***
	-2.742	-2.955	-2.923	-2.655	-3.989	-16.875
Log GDP	0.174***	0.197***	0.234***	0.248***	0.083***	-0.019***
	4.732	6.385	5.873	5.296	4.193	-9.03
Unemployment rate	-0.017***	-0.009***	-0.009***	-0.011***	-0.014***	-0.005***
	-3.731	-2.785	-2.748	-3.08	-6.76	-7.151
Country imports as % GDP	0.001	0	0	-0.004*	0.001*	0
	0.851	0.244	0.03	-1.65	1.845	0.429
Exchange rate change	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	-3.495	-8.847	-9.421	-7.223	-10.202	-14.206
Competition law	0.018					
	0.31					
Capital account openness	-0.286***					
	-3.721					
Corporate governance reform	0.037*					
	1.797					
HHI		0.126***				
		2.805				
Log industry-country imports			-0.051			
			-1.548			
Lagged leverage					0.489***	0.751***
					36.09	136.044
Increase in penalties				0.002		
				0.077		
Change in investigative powers				0.031		
				1.522		
Change in cartel definitions				0.033		
				1.103		
Other cartel laws				-0.061		
				-1.311		
Constant	-1.435***	-1.902***	-1.372***	-2.345***	-0.965***	0.208***
	-3.606	-5.761	-3.384	-4.523	-5.299	9.426
Firm fixed effects	Y	Y	Y	Y	Y	N
Time fixed effects	Y	Y	Y	Y	Y	Y
R-squared	0.543	0.518	0.52	0.525	0.642	0.571
N	118301	143647	140891	117404	140252	140252

* p<0.10, ** p<0.05, *** p<0.01

Panel C. Asset growth and financing deficit

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where in Columns (1)-(4) the dependent variable is annual asset growth, winsorized at 1%, and in Columns (5)-(8) the dependent variable is net issue of debt plus net issue of equity, winsorized at 1%. All regressions include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. Columns (1) and (5) control for other law changes such as the introduction of competition law; the change in corporate governance law and Chinn-Ito index of country's degree of capital account openness. Columns (2) and (6) control for HHI in firm's SIC3 industry in its country. Columns (3) and (7) control for log imports to a firm's SIC3 industry in its country. In Columns (4) and (8), we control for other forms of strengthening anti-cartel legislation. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	Asset Growth				Financing Deficit			
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Leniency law	0.081***	0.141***	0.146***	0.121***	0.082***	0.127***	0.131***	0.115***
	2.945	5.176	4.793	4.784	3.359	5.347	4.93	4.972
Log assets	0.374***	0.327***	0.331***	0.348***	0.280***	0.233***	0.238***	0.246***
	10.753	9.155	8.95	9.077	9.314	8.213	8.156	8.044
ROA	-1.058***	-1.016***	-1.022***	-1.106***	-1.944***	-1.921***	-1.929***	-2.013***
	-6.742	-6.835	-6.997	-8.369	-12.199	-12.946	-13.22	-15.447
Log GDP	-0.500***	-0.370***	-0.347***	-0.581***	0.043			-0.475***
	-14.766	-10.351	-11.46	-8.528	1.236			-8.057
Unemployment rate	0.013***	0.006	0.006*	0.004	0.168***			0.004
	2.642	1.629	1.746	1.094	2.605			1.184
Country imports as % GDP	0	0	0	0.005***	-0.009			0.006***
	-0.138	0.243	0.314	3.291	-0.592			4.165
Exchange rate change	0.000***	0.000***	0.000***	0.000***	-0.453***	-0.345***	-0.336***	0.000***
	69.316	58.844	61.831	131.161	-13.489	-10.687	-11.787	145.591
Competition law	0.064*				0.011**	0.004	0.004	
	1.785				2.323	1.183	1.37	
Capital account openness	0.115*				-0.001	0	0	
	1.763				-0.649	0.189	0.354	
Corporate governance reform	-0.018				0.000***	0.000***	0.000***	
	-1.034				70.771	59.908	63.709	
HHI		-0.013				-0.031		
		-0.336				-0.87		
Log industry-country imports			-0.03				-0.015	
			-0.557				-0.301	
Increase in penalties				-0.075***				-0.065***
				-2.903				-3.213
Change in investigative powers				-0.038*				-0.02
				-1.887				-1.032
Change in cartel definitions				0.092***				0.045
				2.738				1.542
Other cartel laws				-0.071				-0.066
				-1.569				-1.297
Constant	2.947***	1.971***	2.227***	4.184***	3.038***	2.331***	2.449***	3.703***
	10.517	8.323	3.823	7.408	11.517	10.169	4.507	7.396
Firm fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y	Y	Y
R-squared	0.266	0.234	0.235	0.265	0.495	0.485	0.487	0.516
N	127441	154584	151557	127260	126598	153535	150514	126280

* p<0.10, ** p<0.05, *** p<0.01

Table IA3. Issuance Activity: Leniency Laws: Non-US Sample

Panel A. Net equity issuance

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is change in common stock over lagged assets, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is Leniency law dummy. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) treats EU as one country and for EU member countries assumes the passage of leniency law to be the latest of 2002 and the year when the country joined EU. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Leniency law	0.051***	0.037***	0.036***	0.032***	0.034**	-0.001
	3.404	2.625	3.891	2.905	2.324	-0.09
Log assets		0.165***	0.129***	0.177***	0.175***	0.165***
		11.165	9.698	11.198	11.418	11.189
ROA		-1.499***	-0.977***	-1.483***	-1.496***	-1.500***
		-13.683	-9.453	-14.171	-14.208	-13.67
Log GDP		-0.238***	-0.174***	-0.221***	-0.246***	-0.248***
		-10.226	-11.947	-9.921	-11.107	-10.34
Unemployment rate		0.002	0.001	0	-0.003	0
		1.106	0.899	0.059	-1.282	0.056
Country imports as % GDP		-0.003***	-0.002***	-0.002***	-0.003***	-0.003***
		-4.62	-5.164	-5.389	-6.019	-4.862
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***
		4.404	4.476	4.338	4.312	4.402
Tangibility			-0.337***			
			-10.957			
Sales growth			-0.019***			
			-4.809			
Constant	0.240***	1.713***	1.331***	1.708***	1.908***	1.867***
	19.027	8.972	10.676	3.531	8.419	9.555
Firm fixed effects	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N
Region*year fixed effects	N	N	N	N	Y	N
R-squared	0.202	0.367	0.271	0.381	0.377	0.366
N	286572	228735	197409	228735	228735	228735

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Net debt issuance

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is change in financial debt over lagged assets, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is Leniency law dummy. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) treats EU as one country and for EU member countries assumes the passage of leniency law to be the latest of 2002 and the year when the country joined EU. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Leniency law	0.003	0.003	0.001	0.002	0.004*	0
	1.24	1.416	0.569	0.848	1.88	-0.042
Log assets		0.041***	0.055***	0.044***	0.042***	0.041***
		16.227	20.496	16.917	16.226	16.206
ROA		-0.019**	0.002	-0.019**	-0.020***	-0.019**
		-2.451	0.193	-2.539	-2.636	-2.458
Log GDP		-0.046***	-0.052***	-0.036***	-0.048***	-0.047***
		-11.295	-12.437	-8.301	-10.993	-11.679
Unemployment rate		-0.003***	-0.003***	-0.003***	-0.004***	-0.003***
		-7.228	-5.524	-7.644	-7.62	-7.443
Country imports as % GDP		0.000***	0.000***	0.000**	0.000***	0.000***
		3.75	3.416	2.509	3.223	3.682
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***
		4.468	4.54	4.495	4.549	4.467
Tangibility			0.031***			
			3.908			
Sales growth			-0.003***			
			-2.867			
Constant	0.064***	0.252***	0.218***	0.219**	0.261***	0.265***
	13.967	6.553	5.37	1.962	4.118	7.036
Firm fixed effects	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N
Region*year fixed effects	N	N	N	N	Y	N
R-squared	0.064	0.089	0.093	0.095	0.094	0.089
N	286753	228733	197363	228733	228733	228733

* p<0.10, ** p<0.05, *** p<0.01

Table IA4. Issuance Activity: Export Market Laws (in Other Countries): Non-US Sample

Panel A. Net equity issuance

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is change in common stock over lagged assets, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4), includes SIC3 industry*year fixed effects. Column (5), includes geographic region*year fixed effects. In Column (6), the main variable of interest is instead a continuous variable of firm subsidiary location-weighted laws passed in other countries. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Export leniency laws	0.053***	0.047***	0.040***	0.062***	0.059***	
	3.936	3.442	3.883	4.383	3.92	
Subsidiary-based leniency laws						0.043***
						2.815
Log assets		0.146***	0.108***	0.148***	0.152***	0.163***
		8.053	6.75	8.073	8.08	5.84
ROA		-1.300***	-0.893***	-1.304***	-1.306***	-1.330***
		-8.98	-6.434	-9.187	-9.212	-5.731
Log GDP		-0.230***	-0.177***	-0.186***	-0.228***	-0.215***
		-9.555	-9.342	-7.721	-9.681	-5.479
Unemployment rate		0.003*	0.002	0.001	-0.002	0.003
		1.709	1.106	0.769	-1.022	1.196
Country imports as % GDP		-0.002***	-0.002***	-0.001***	-0.002***	-0.002*
		-4.399	-5.027	-3.034	-4.551	-1.952
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***
		59.745	86.271	58.65	61.797	96.84
Tangibility			-0.386***			
			-8.023			
Sales growth			-0.015**			
			-2.519			
Constant	0.176***	1.643***	1.431***	0.802*	1.267***	1.365***
	13.669	9.379	9.221	1.86	5.722	4.326
Firm fixed effects	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N
Region*year fixed effects	N	N	N	N	Y	N
R-squared	0.175	0.316	0.256	0.321	0.326	0.553
N	131188	98701	87683	98701	98701	31755

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Net debt issuance

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is change in financial debt over lagged assets, winsorized at 1%. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. In Column (3), we control for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. In Column (6), the main variable of interest is instead a continuous variable of firm subsidiary location-weighted laws passed in other countries. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Export leniency laws	0.005	0.002	0.001	0.005	0.005	
	1.191	0.448	0.166	1.194	1.169	
Subsidiary-based leniency laws						0.002
						0.223
Log assets		0.047***	0.056***	0.048***	0.048***	0.063***
		15.495	16.201	15.365	15.279	8.68
ROA		0.003	0.021	0.002	0.002	0.050**
		0.254	1.324	0.158	0.129	2.021
Log GDP		-0.054***	-0.054***	-0.042***	-0.056***	-0.061***
		-10.355	-8.936	-7.303	-9.394	-4.418
Unemployment rate		-0.003***	-0.003***	-0.003***	-0.004***	-0.002*
		-5.728	-5.067	-5.481	-5.695	-1.954
Country imports as % GDP		0.001***	0.001***	0.000***	0.001***	0.001**
		3.668	3.111	2.705	3.722	2.366
Exchange rate change		0.000***	0.000***	0.000***	0.000***	0.000***
		59.279	88.02	55.534	52.687	81.078
Tangibility			0.036***			
			2.816			
Sales growth			-0.004**			
			-2.223			
Constant	0.056***	0.282***	0.218***	0.264*	-0.320***	0.207
	10.482	5.449	3.541	1.925	-4.635	1.497
Firm fixed effects	Y	Y	Y	Y	Y	Y
Time fixed effects	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N
Region*year fixed effects	N	N	N	N	Y	N
R-squared	0.061	0.089	0.096	0.093	0.093	0.108
N	131279	98660	87635	98660	98660	31790

* p<0.10, ** p<0.05, *** p<0.01

Table IA5. Debt-Equity Ratio: Non-US Sample

Panel A. Leniency law

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is book debt to book equity ratio, limited to between 0 and 9. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is Leniency law dummy. In Column (1), we test its effect without any additional controls. In Column (2), we control for firm and country characteristics. Column (3) controls for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. Column (6) treats EU as one country and for EU member countries assumes the passage of leniency law to be the latest of 2002 and the year when the country joined EU. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Leniency law	-0.022**	-0.024*	-0.031**	-0.013	-0.038***	-0.008
	-2.025	-1.941	-2.396	-1.106	-2.742	-0.615
Log assets		0.156***	0.199***	0.160***	0.155***	0.156***
		13.872	13.943	14.339	13.434	13.889
ROA		-0.181***	-0.357***	-0.179***	-0.182***	-0.181***
		-6.346	-8.051	-6.583	-6.445	-6.309
Log GDP		0.175***	0.185***	0.135***	0.185***	0.179***
		5.8	5.772	4.123	5.519	5.947
Unemployment rate		-0.003	-0.002	-0.003	0	-0.003
		-1.181	-0.695	-0.895	0.033	-0.91
Country imports as % GDP		0.001	0.002**	0.001	0.002**	0.001*
		1.625	2.407	1.113	2.421	1.69
Exchange rate change		-0.000***	-0.000***	-0.000**	-0.000***	-0.000***
		-5.596	-6.674	-2.328	-2.984	-5.635
Tangibility			0.585***			
			9.242			
Sales growth			-0.006			
			-1.551			
Constant	0.814***	-1.980***	-2.502***	-0.072	-2.193***	-2.046***
	28.965	-6.302	-7.487	-0.103	-5.731	-6.535
Firm fixed effects	Y	Y	Y	Y	N	Y
Time fixed effects	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	N	Y	N	N
Region*year fixed effects	N	N	N	N	Y	N
R-squared	0.525	0.564	0.705	0.584	0.567	0.563
N	303108	219001	195198	189044	219001	219001

* p<0.10, ** p<0.05, *** p<0.01

Panel B. Export market laws (in other countries)

We consider all non-financial Compustat Global and North America firms over 1990-2012. This table reports OLS regressions, where the dependent variable is book debt to book equity ratio, limited to between 0 and 9. All regressions, except where it is stated otherwise, include firm fixed effects and time fixed effects. Standard errors are clustered at the country-SIC3 industry level.

Our main variable of interest is a continuous variable of country-SIC3 export-weighted laws passed in other countries. In Column (1), we test its effect without any additional controls. In Column (2) we control for firm and country characteristics. Column (3) controls for additional firm characteristics. Column (4) includes SIC3 industry*year fixed effects. Column (5) includes geographic region*year fixed effects. In Column (6), the main variable of interest is instead a continuous variable of firm subsidiary location-weighted laws passed in other countries. *, **, and *** denote significance at the 10%, 5%, and 1%, respectively.

	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Export leniency laws	-0.069***	-0.034	-0.029	-0.014	-0.060**	
	-2.783	-1.241	-1.023	-0.561	-2.001	
Subsidiary-based leniency laws						-0.032
						-0.779
Log assets		0.129***	0.167***	0.136***	0.132***	0.181***
		8.329	9.414	8.576	8.042	4.526
ROA		-0.286***	-0.447***	-0.281***	-0.286***	-0.338***
		-4.928	-6.327	-4.958	-5.044	-4.56
Log GDP		0.188***	0.207***	0.171***	0.187***	0.477***
		5.322	5.862	4.556	4.675	4.22
Unemployment rate		-0.007*	-0.004	-0.007*	0.002	-0.001
		-1.736	-0.949	-1.782	0.377	-0.129
Country imports as % GDP		0.001	0.002*	0.001	0.002	0.004*
		0.832	1.675	0.809	1.363	1.789
Exchange rate change		-0.000***	-0.000***	-0.000***	-0.000**	0
		-8.041	-6.659	-3.192	-2.152	0.53
Tangibility			0.645***			
			8.349			
Sales growth			-0.010**			
			-2.003			
Constant	0.835***	-1.881***	-2.526***	-0.374	-1.916***	-5.629***
	22.808	-5.383	-7.139	-0.355	-3.424	-4.526
Firm fixed effects	Y	Y	Y	Y	N	Y
Time fixed effects	Y	Y	Y	Y	Y	Y
Industry*year fixed effects	N	N	Y	N	N	N
Region*year fixed effects	N	N	N	Y	N	N
R-squared	0.503	0.536	0.557	0.54	0.538	0.645
N	139313	95104	84513	95104	95104	30651

* p<0.10, ** p<0.05, *** p<0.01