

# Corporate Governance and International Trade Shocks\*

**Mario Daniele Amore**  
*Copenhagen Business School*

**Alminas Zaldokas**  
*INSEAD*

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## **Abstract**

We study how the quality of corporate governance affects firms' competitive position. Our identification relies on exogenous variations in both corporate governance and product market competition experienced by U.S. firms in the late 1980s. While the Canada-U.S. Free Trade Agreement of 1989 increased foreign competition, the Business Combination laws, passed between 1985 and 1991 in thirty U.S. states, weakened corporate governance. We find that the operating and stock market returns of firms subject to worse corporate governance were more negatively affected by the subsequent increase in competitive pressures. This effect was stronger for small, young and low-productivity firms. We also find that worse corporate governance impaired the exporters' ability to benefit from the reduction in export tariffs to Canada. The differences in performance are related to a superior ability of well governed firms to raise external finance, thus resisting predatory attacks by foreign competitors.

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# 1. Introduction

The effect of corporate governance on the determination of firm policies and, ultimately, operating returns and market value has received great attention in the finance and economics literature. In particular, an extensive research has documented that, by shaping agency conflicts within the firm, corporate governance mechanisms have significant implications for many corporate policies, such as cash holdings (Dittmar and Mahrt-Smith 2007; Harford et al. 2008), debt financing (Klock et al. 2005), acquisitions (Masulis et al. 2007) and innovation (Aghion et al. 2009; Sapra et al. 2009). Other works have assessed the importance of corporate governance in facing an adverse shock such as the Asian financial crisis (Johnson et al. 2000; Mitton 2002). Overall, the existing evidence indicates that better-governed firms have higher productivity (Bertrand and Mullainathan 2003) and shareholder value (Gompers et al. 2003; Cuñat et al. 2011).

We contribute to this literature by examining how corporate governance affects a firm's ability to adapt to changes in the competitive environment. In the attempt to empirically disentangle the effects of governance and competition on corporate outcomes, we face two major obstacles. First, the quality of corporate governance is typically correlated with unobservable factors which bias any inference (Bertrand and Mullainathan 2003). Second, the strong feedbacks between governance and competitive actions make hard to separate out their consequences for firms.

To avoid simultaneity and endogeneity problems, we consider how an exogenous variation in corporate governance influences the ability to react to a subsequent exogenous increase in competitive pressures. These exogenous variations are provided by two policy changes: the Canada-U.S. Free Trade Agreement (FTA) of 1989, which led to a significant increase in foreign competition for U.S. firms, and the Business Combination (BC) laws, passed by thirty U.S. states over 1985-91, that worsened the quality of corporate governance of firms incorporated in those states by reducing the threat of hostile takeovers. Using a sample of U.S. publicly traded firms over 1976-95, we find that the FTA's negative effect on operating and stock market performance was larger for firms incorporated in states that had previously passed BC laws. This evidence indicates that worse corporate governance rendered firms significantly unable to respond to changes in the competitive environment. While worse-governed exporters were unable to benefit from the drop in export tariffs to Canada, non-exporters subject to worse governance became

more vulnerable to the increase in competition induced by lower import tariffs. Furthermore, we find that the negative effect of increased foreign competition is stronger for firms that were small, young, less productive, and located closer to the Canadian border. Finally, we link these results on performance to a superior ability of better-governed firms to raise external finance, which became more important after the competition strengthened.

The Canada-U.S. FTA provides a plausibly exogenous variation in competition. Contrary to some other free trade agreements, the Canada-U.S. FTA was largely unanticipated and not accompanied by any other significant economic reform, nor was it a response to the economic conditions (Trefler 2004, Breinlich and Cuñat 2011). In addition, as Canada and the U.S. are main trading partners, the effect of the FTA was economically significant for the U.S. economy.<sup>1</sup> Finally, since the agreement mainly consisted of abolishing existing import tariffs which differed across industries, the increase in competition following the FTA had a measurable cross-sectional variation.

Similarly, the passage of BC laws induced exogenous variations in one dimension of corporate governance - the market for corporate control. In particular, BC laws restricted certain transactions such as mergers and asset sales between firms and their large shareholders for a period of three to five years after the large shareholder's stake passed a pre-specified threshold (Giroud and Mueller 2010). This moratorium thus hindered acquirers' access to the target firms' assets and limited their ability to pay down acquisition debt. By making hostile takeovers more difficult if not impossible, BC laws weakened the overall quality of corporate governance thereby increasing the opportunities of managerial slack (Bertrand and Mullainathan 2003; Giroud and Mueller 2010).

We first focus on operating performance. In particular, we interact a dummy indicating whether a firm was incorporated in a state subject to BC law with a variable measuring the drop in import tariffs in the firm's industry due to the FTA. The inclusion of firm fixed effects allows us to control for time invariant differences in corporate governance and competitive positions. Also, since our identification relies on the interaction between states of incorporation and industries, we can control for the economic conditions of the states where firms are

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<sup>1</sup> Clausing (2001) finds that a 1% reduction in import tariffs after the FTA was associated with a 10-11% increase in U.S. imports from Canada. He also estimates that the FTA raised Canadian exports to the U.S. by an annual \$23 billions. Since Canada was the main U.S. trading partner, providing around one fifth of total imports, and, as Clausing (2001) shows, there was no trade diversion, the effect of the FTA was substantial for the U.S. economy.

headquartered. Consistent with the notion that BC laws increased managerial slack, we find that the adoption of BC laws by a state had a significant negative impact on the operating performance (ROA) of firms incorporated in that state – on average, ROA dropped by 1.9% for these firms. FTA also had a negative impact on operating performance. The ROA of firms that experienced an average tariffs cut dropped by 1.7% after the FTA. When we examine the combined effect of the two policy changes, we find that the interaction between BC laws and lower import tariffs was also negative and statistically significant. For firms exposed to BC laws, the average cut in import tariffs caused a drop in ROA of 1.85%.tariffs cut

After having established an effect for the average firm, we test if our results are stronger among firms that are expected to be most hit by the FTA and BC laws. We first posit that non-exporters are affected more negatively by trade liberalization as they typically are less productive (Bernard and Jensen 2004) and less likely to benefit from the reduction in export tariffs. Consistent with this prediction, we find that worse corporate governance amplifies the negative effect of import competition for non-exporters. However, for the sample of exporters we find that that worse governance limits the ability to benefit from the drop in export tariffs to Canada. Trade liberalizations have been found to induce productivity gains from the reallocation of market shares from the least to the most productive firms (Pavcnik 2002; Melitz 2003). Also, low-productivity firms have a higher probability of being taken over due to higher potential efficiency gains (Maksimovic and Phillips 2001). If that is the case, the combination of worse corporate governance and the subsequent increase in foreign competition should be most hurting firms with low productivity and in the early stage of development. Consistent with this notion, our results show that indeed when the competition increases worse corporate governance is particularly harmful for small firms, young firms, and firms with low total factor productivity. Gravity models of international trade suggest that the intensity of trade decreases with distance. We then examine the geographic heterogeneity of our results by testing whether the negative effect of the trade shock and its interaction with the quality of governance depend on the distance from a firm's headquarters to Canada. We find that both of these negative effects on profitability are concentrated among firms that are located closer to the Canadian border.

In addition to these results on operating performance, we document a significant decline in the market value of firms exposed to tariffs cut and incorporated in the states with BC laws. First, we confirm the results in the panel of market to book ratios. Second, we use an event study to

show that companies with worse corporate governance had a more negative stock price reaction to the FTA. The trade agreement encountered substantial opposition in Canada, and its fate was determined by a narrow victory of the Conservative Party in the general election of November, 1988. Thus, the election date offers a good setting to assess the stock market reaction to the FTA (Breinlich 2010; Morck et al. 2000). We examine abnormal returns for U.S. firms around the first trading day after the election. Our findings indicate that over six days stock prices dropped by 1.88% more for firms subject to BC laws compared to other firms.

One concern with our results is that the passage of the FTA or BC laws may have been anticipated, i.e. the parallel trends hypotheses required for the validity of our model are violated. We perform a placebo test assuming that the FTA was already expected in 1986 – as negotiations started in September 1985 – but do not find any effect of such placebo policy on operating and stock market performance. Similarly, we do not find any significant effect of a placebo implementation of BC laws three years before their actual passage. Another concern is that the size of the tariffs cut was correlated with the pre-FTA industry characteristics and instead of the change in competition we capture inherent industry characteristics. To mitigate this concern, we control for several industry characteristics that are typically associated with the trade protection (Guadalupe and Wulf 2010). Our results are also robust to the inclusion of the Herfindahl-Hirschman Index (HHI) to control for the concentration of the U.S. industries, and the interaction between HHI and BC laws (as in Giroud and Mueller 2010). Furthermore, our results are robust to the exclusion of firms incorporated in Delaware and multi-segment firms. Finally, we confirm our findings by adopting an alternative proxy for the quality of corporate governance – the degree of institutional ownership in the firm (Nikolov and Whited 2009), and an alternative proxy for the foreign competition – the industry-level import penetration, instrumented by the real exchange rates (Bertrand 2004).

Having established that corporate governance plays a role in how firms adapt to changes in the competitive environment, we examine the possible explanations for this relationship. One mechanism that justifies our results is that an increase in competition requires firms to raise external finance. Firms subject to worse governance have a lower ability to raise external funds (Jensen and Meckling 1976), while higher credit constraints limit a firm's ability to react to trade liberalization (Manova 2008). Examining changes in the capital of U.S. firms, we find that firms subject to BC laws raised less external finance (both debt and equity) in the post-FTA period

compared to other firms. Combined with our results on operating performance, this evidence suggests that a superior ability of better-governed firms to access external finance allows them to safeguard against the increase in external competition. Alternatively, our findings on financial policies may be consistent with the interpretation that worse-governed firms choose not raise additional external finance either because it is too costly for them, or because managers do not exert appropriate effort. The latter quiet life hypothesis would mean that by affecting managerial incentives, worse corporate governance limits the CEOs' willingness to undertake cognitively difficult tasks (Bertrand and Mullainathan 2003).

The study closest to ours is Morck et al. (2000), which finds that the Canadian firms hit most by the FTA were heir-managed family firms that with the expansion of export markets have lost their comparative domestic advantage to the widely-owned firms. We improve and extend this study in two ways. First, we focus on U.S. companies and control for the endogeneity of corporate governance by employing BC laws as a shock to the market for corporate control. Second, we uncover a particular channel – a need to raise external funds – that explains why corporate governance matters for the firm's ability to compete in the product market.

Our work is also related to a recent literature testing whether competition acts as a governance device (Alchian 1950; Stigler 1958). For instance, Giroud and Mueller (2010) documents that BC laws reduced profitability primarily in less competitive industries.<sup>2</sup> Instead, we examine how governance affects the ability to compete in the product market. While Giroud and Mueller (2010) are interested in how the change in corporate governance affected firms based on the existing industry concentration, we investigate the differences in firm responses when the degree of import competition in the product markets moved from one equilibrium to the other. Our results are thus not directly comparable to those of Giroud and Mueller (2010) but complement them in suggesting strong links between competition and corporate governance.

Moreover, we relate to the literature on heterogeneous firms and international trade (Melitz 2003). Recent research has emphasized the role of credit supply on firms' exports (Manova 2008, 2010; Paravisini et al. 2011). Instead, we look into how the access to financing affects the response of domestic producers to an increase in import competition. In particular, we test how corporate governance determines the financing ability. Our results thus suggest that corporate

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<sup>2</sup> Kadyrzhanova and Rhodes-Kropf (2011) find that the interaction between industry concentration and corporate governance might have both positive and negative association with the firm value depending on the type of the governance provisions considered.

governance might be one of the factors determining which firms benefit or suffer more from trade liberalizations.

Finally, our work is close to a literature studying how firms adapt to an increase in competition. Increases in competition have been shown to lead to more outsourcing (Grossman and Helpman 2004), flatter and more decentralized organizations (Guadalupe and Wulf 2010; Bloom et al. 2010), higher pay-for-performance sensitivity (Cuñat and Guadalupe 2005, 2009), and upgrading of technology (Bustos 2011). Taken together, these works suggest that an increase in competition requires undertaking managerial actions. By showing that a firm's response to trade liberalization is shaped by the governance quality, our results suggest that the misalignment of incentives between managers and shareholders limits the ability to face changes in the competitive environment.

The paper proceeds as follows. Section 2 describes our data and key variables. Section 3 discusses our empirical methodology. Section 4 presents our main findings on operating performance. Section 5 discusses results on market values. Section 6 explores the role of external finance. Section 7 concludes.

## **2. Data and variables**

### **2.1 Data sample**

Our dataset consists of publicly listed firms located and incorporated in the U.S. We restrict our analysis primarily to manufacturing firms (SIC codes up to 4000) as the FTA only affected the tradable sector (Guadalupe and Wulf 2010). We draw our data from the Compustat dataset, excluding the firms for which book value of assets or net sales are either missing or negative, and industries for which we do not have tariffs data. Our sample period stretches from 1976 to 1995, as in Bertrand and Mullainathan (2003) and Giroud and Mueller (2010), and consists of 3,567 unique firms and 34,279 firm-year observations.

We use the Compustat dataset of public firms rather than establishment-level data from the U.S. Census for several reasons. First, most of the financial decisions which drive our results are made at the headquarter-level rather than by individual plants. Second, since private firms typically have higher financial constraints than public firms we believe that our results generalize to a broader array of firms.

## 2.2 Measures of corporate governance

BC laws were introduced across U.S. states at different times. Table 1 reports the years when BC laws were passed in each state, as well as the distribution of firms by states of location and incorporation.<sup>3</sup> In our sample, 33.1% of the firms are incorporated in their state of location.<sup>4</sup> We also report that 20 states, which amount to 15.7% of firm-year observations, never passed a BC law.

In Figure 1, we illustrate the timing of BC law passages around the FTA. Most of the firms (79.1%) are incorporated in the states that passed a BC law before or in 1989, the year of the FTA. For this reason, we interpret our results as indicating the combined impact of an exogenous worsening of corporate governance and a subsequent increase in foreign competition.<sup>5</sup>

As a robustness check, we proxy the quality of corporate governance using the fraction of institutional ownership. Usual corporate governance indices such as those constructed by Gompers et al. (2003) or Bebchuk et al. (2009) are unavailable for the period we study. Moreover, Nikolov and Whited (2009) claim that these indices do not capture latent poison pills that can be introduced without shareholders consent. Rather, they suggest that institutional investor ownership represents a better proxy for corporate governance. We draw the annual data on institutional investor holdings from the SEC 13 filings in Thompson Financial CDA/Spectrum database. All institutional investors with greater than \$100 million of securities under management are required to report their holdings to the SEC on form 13F and disclose all common stock positions greater than 10,000 shares or \$200,000.

## 2.3 Measures of competition and industry concentration

The FTA abolished existing tariffs between U.S. and Canada. Since these tariffs differed across industries, we quantify how the FTA increased foreign competition for U.S. firms by using the average tariffs on imports from Canada that applied to a given industry before the FTA.

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<sup>3</sup> Given that firms are affected by BC laws in their state of incorporation, a potential misclassification arises from the fact that Compustat only reports the state of incorporation for the latest year available. However, as changes in incorporation during the period considered were rare (Romano 1993), we assume that firms do not change their state of incorporation over the sample period.

<sup>4</sup> As shown, most of the firms in our sample are incorporated in Delaware; however, in Section 4.3 we confirm that our results are robust to the exclusion of Delaware firms.

<sup>5</sup> To stress this interpretation, in a robustness check in Section 4.3 we exclude firms incorporated in states that passed BC laws after the FTA.



As shown by Clausing (2001), the larger were the import tariffs in place in a given industry, the greater was the competitive shock.

We use each firm's primary four-digit SIC code to identify its industry and thus the relevant tariffs. We extract tariffs data from the Center for International Data at UC Davis. We start by computing the average tariffs in the industry by summing the customs value of imports and duties paid across all sub-industries of each four-digit SIC industry in each year before 1989. We then divide the total duties paid by the total customs value of imports and use this as our proxy for the import tariffs from Canada that each four-digit SIC industry faced in a particular year. The main treatment in our specification is the change from the average import tariffs in the pre-FTA period, computed over the three years prior to the implementation of the FTA (1986-88), to zero in the post-FTA period (from 1989 onwards). Table 2 lists the twenty industries with the highest tariffs on Canadian imports. Table 3 shows that the cut in import tariffs due to the FTA was, on average, 4% and ranged between 0 and 36%.

Due to its bilateral nature, the FTA also improved opportunities for U.S. exports to Canada. To separate this effect from the increase in competition, we use export tariffs data from Trebler (2004) and construct a similar variable as we do for the import tariffs. In particular, we measure the drop in export tariffs to Canada in the four-digit U.S. SIC industry.

Although we consider the import and export tariffs to be zero for all industries post-1989, in some industries the tariffs reductions were phased-out over as long as five-ten years after the FTA was passed.<sup>6</sup> Nevertheless, we treat all industries equally regardless of their phase-out schedule.<sup>7</sup> As discussed in Guadalupe and Wulf (2010), doing so has the advantage of mitigating the potential endogeneity of the phase-out schedule.

We control for the existing domestic concentration by using the HHI based on the distribution of sales of the publicly listed firms in a particular three-digit SIC industry. A higher HHI implies higher industry concentration. We follow Giroud and Mueller (2010) and correct for the potential misclassifications due to the presence of a single firm in a given industry by dropping 2.5% of the firm-year observations at the right tail of the HHI distribution. As shown in

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<sup>6</sup> Annex 401 of the treaty outlines the actual phase-out schedule. However, there is anecdotal evidence that many industries lobbied to speed up the phase out with the first review of the initial schedule adopted just a year after the FTA (see, for instance, the New York Times, "Canadian Trade Pact Accelerated", on March 14, 1989).

<sup>7</sup> Thus, we implicitly assume that firms started adjusting to the new competitive situation right after the passage of the FTA, and phase outs only helped to preserve temporary profits. However, in untabulated results we also find that the results are robust to using the actual tariffs, re-estimated annually after year 1989.

Table 3, the average HHI in 1988 (one year prior to the passage of the FTA) is around 0.2, which is close to the overall average reported in Giroud and Mueller (2010).

As a robustness check, we adopt the import penetration at the industry level as alternative measure of foreign competition. An industry's import penetration is defined as the ratio of dollar value of imports over the sum of dollar value of imports and dollar value of domestic production. Since import penetration can be endogenous to the profitability in the industry, we follow Bertrand (2004) and instrument it with the weighted average of the real exchange rates of the importing countries. In particular, the weights for each industry are the shares of each foreign country's imports in the total imports of that industry, fixed in 1981; thus, the instrument varies both by time and industry.

## 2.4 Firm outcomes

Our main measure of operating performance is the return on assets (ROA), computed as operating profits before depreciation and amortization (EBITDA) over the beginning-of-year book value of assets.<sup>8</sup> To mitigate the concern of outliers, we drop 1% of the firm-year observations at each of the tails of the ROA distribution.

We also compute the market to book value ratio (MB ratio) by dividing the market value of firm at the end of its fiscal year to the book value of common equity. Following Baker and Wurgler (2002), MB ratio is limited to lie between 0 and 10.

We define a number of firm characteristics to examine whether our effect is stronger among firms for which the FTA was expected to hurt more. First, we consider separately exporters and non-exporters, which were potentially affected differently due to the bilateral nature of the FTA; exporters are classified as firms that report an average of at least 1% of export to sales for the pre-FTA period<sup>9</sup>. Second, we look at the firms at different stages of development, such as young and old firms, or small and large firms. Third, we sort firms depending on their total factor productivity (TFP), estimated following the semi-parametric procedure in Olley and Pakes

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<sup>8</sup> We are primarily interested in how an increase in foreign competition affects the profitability of the firms; however, given that profitability is monotonically and positively related to productivity (Imrohorglu and Tüzel 2011) and productivity has been often proxied by profitability measures in the finance literature (Novy-Marx 2010, Gourio 2007), our results also suggest that a bilateral weakening of trade barriers has, on average, a more negative effect on the productivity of domestic firms with worse corporate governance.

<sup>9</sup> We use a 1% threshold to avoid trivial values in exports. However, our results are qualitatively similar if we classify exporters as firms that report exports greater than zero, and non-exporters as firms that do not report any exports in a given year.

(1996).<sup>10</sup> Finally, we measure a firm's proximity to the Canadian border, proxied by the distance of the largest city in the state of location of firm's headquarters to the closest road crossing of the U.S.-Canada border.

Our main measures of external finance are based on the net changes in debt and equity, measured as in Hovakimian et al. (2001) and Leary and Roberts (2005). In particular, we define the capital raised in a given year as the net change in equity and debt, normalized by the firm's book value of assets in the previous year. We are interested in the firms raising rather than returning capital. We thus consider only the positive values of the capital raised, i.e. if the net change in debt and equity is negative, we record the capital raised as zero.<sup>11</sup> To deal with outliers, we cap the fraction of capital raised to assets at 1. Finally, due to data reliability we follow Leary and Roberts (2005) and restrict our external finance analyses to the period of 1984-1995.

We report summary statistics for the main variables of interest in Table 3. Table A1 in the Appendix provides a complete description of the variables used.

### **3. Identification strategy**

Since corporate governance is an equilibrium outcome, to a large extent determined by the firm, establishing a causal link between corporate governance and firm performance has been challenging. A positive association between profitability and a measure of governance quality, such as board independence, could indeed mean that good governance is beneficial for firm performance. However, this relation is plagued by three problems. First, companies may adopt effective governance mechanisms as a response to good performance; hence, corporate governance is not the determinant but rather the consequence of firm performance. Second, the quality of corporate governance may be correlated with factors that are not observed by the researcher, such as CEO's preferences, that directly affect firm policies; in this case, one would mistakenly attribute the effect of such omitted factors to corporate governance. Third, if we want to establish whether corporate governance matters in how a changing competitive environment affects a firm's performance, we run into additional problems. In the industries in which good

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<sup>10</sup> The firm-level variables used to compute TFP are the logarithms of sales, employment, capital expenditures, and property, plants and equipment.

<sup>11</sup> However, our results are robust to not restricting the issuance variable at zero and also considering negative net changes in debt and equity.

corporate governance starts being more important for the operating performance, competition could intensify. If that happens, firms could be improving governance in the quest of improving performance and thus competing more aggressively. Moreover, some unobservable variables such as rising industry's productivity could be both increasing the degree of competition and cementing the link between corporate governance and performance.

We deal with these concerns by combining two types of difference-in-differences (DD) models that establish exogenous variations in both the quality of corporate governance and the intensity of foreign competition. First, we exploit the staggered passage of BC laws at the state of incorporation (Bertrand and Mullainathan 2003; Giroud and Mueller 2010). We assume that after controlling for state-level business conditions and firm time-invariant effects, the parallel trends assumption between treatment and control groups holds, and thus we are able to identify the effect of the worsened corporate governance on the firm's performance.<sup>12</sup> Second, we use the adoption of the FTA as an exogenous variation in the competitive environment. As pre-FTA tariffs for imports from Canada differed across U.S. industries, the exposure to the FTA and thus the effect on competition varied across industries, even though the timing of the change was uniform.<sup>13</sup>

The combination of the FTA and BC laws to establish exogenous variations in competitive pressures and corporate governance has a number of methodological advantages. First, analyzing the combined impact of corporate governance and competition on firms by means of cross-sectional measures of governance and competition suffers from omitted factor bias. Adopting shocks to competition and governance provides a more complete solution to this concern than controlling for all potentially omitted variables. Second, corporate governance can be argued to have an effect on the product market strategy, and thus on the measures of industrial

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<sup>12</sup> Since our identification relies on BC laws that were passed a few years before the FTA, one concern is that firms might have adjusted their internal governance mechanisms and thereby BC laws (especially the early passages) should not matter by the time of the FTA. Such concerns only mean that we are estimating a lower bound of the corporate governance effect to the FTA since we are not able to control for the fact that some firms actually reduced managerial slack. Still, we deal with this issue. First, we find that our results are robust to the exclusion of firms that experienced the earliest BC passage (in 1985) and thus had the most time to adjust. Second, when looking at the dynamic effect of BC laws on firms we find that the negative effect of BC laws on ROA did not disappear immediately, but rather it was persistent over the years after the BC was passed.

<sup>13</sup> In adopting this approach, we follow Card (1992) who uses a variable to classify cross-sectional units according to their exposure to a law change. A statistically significant coefficient of this treatment variable means that it is a good predictor of changes in the dependent variable induced by the policy change (Angrist and Pischke 2008). In our case, the degree of exposure is measured by the average tariffs on Canadian imports that applied in the industry before the FTA.

composition. Hence, it is difficult to interpret the impact of BC laws and e.g. HHI on firm outcomes if HHI itself changed in response to BC laws. Using the FTA mitigates this problem because BC laws should not have induced immediate systematic increases in import tariffs, which are decided at an international level.<sup>14</sup> Third, using the FTA to establish exogenous and measurable variations in competition circumvents the methodological difficulties in measuring the competitive pressures.<sup>15</sup> Similarly, BC laws provide a reliable way to assess the effect of corporate governance since consistent firm-level corporate governance measures are lacking for the period around the FTA passage.<sup>16</sup>

We adopt two regression models to estimate how worse corporate governance affected subsequent reactions to an increase in competition. Our first approach is a simple exercise in which we estimate the impact of increased competition due to the FTA depending on whether the firms were subject to BC laws or not. In particular, we estimate the following regression on the subsamples of firms incorporated in the states that passed and the states that did not pass a BC law:

$$ROA_{ijkt} = \alpha_i + \alpha_t + \beta_1 Tariffs\ cut(Imports)_{jt} + \beta_2 Tariffs\ cut(Exports)_{jt} + \gamma' X_{ijkt} + e_{ijkt}$$

where  $i$  indexes firms,  $j$  indexes four-digit SIC industries,  $k$  indexes states of incorporation, and  $t$  indexes time. The dependent variable  $ROA_{ijkt}$  is the return on assets.  $Tariffs\ cut(Imports)_{jt}$  measures the average level of tariffs on Canadian imports in the industry  $j$  before the passage of the FTA interacted with a dummy equal to one for the post-FTA period.<sup>17</sup> Similarly,  $Tariffs\ cut(Exports)_{jt}$  measures the average level of tariffs on exports to Canada in the industry  $j$  before the

<sup>14</sup> If anything, import tariffs decreased slightly over time, including the period when the BC laws were passed.

<sup>15</sup> Many empirical works have stressed the importance of dealing with the endogeneity of product market competition, by using e.g. regulation indexes (Guadalupe and Perez-Gonzales 2011), exchange rates and import tariffs as instruments (Cuñat and Guadalupe 2005), sharp appreciation of currencies (Cuñat and Guadalupe 2009), and policy instruments (Aghion et al. 2005). Also, the measures such as HHI or Lerner index are highly non-monotonic in the actual competitive situation (Schmalensee 1989), and fail to account for the competitive pressure from potential entrants. An additional issue – that HHI indices in the empirical corporate finance research are often based only on public corporations that constitute a small fraction of the universe of firms – has been addressed by Ali et al. (2009).

<sup>16</sup> One concern could be that BC laws have had no corporate governance effect but simply a smaller number of inefficient firms could have been taken over after the introduction of BC laws because of higher institutional constraints. Such argument goes against the findings of previous research of no actual drop in the M&A activity after BC laws (e.g., Comment and Schwert 1995; Giroud and Mueller 2010). As Garvey and Hanka (1999) claim, BC laws raise the cost of takeover activity while the resulting slack also increases the payoff from a successful takeover. Thus, the reduced threat of takeovers should not necessarily result in lower actual takeover activity.

<sup>17</sup> Following Guadalupe and Wulf (2010), we compute the pre-FTA import tariffs using four-digit SIC averages for the period between 1986 and 1988 as the baseline treatment. As robustness checks, we use alternative procedures, such as averages based on three-digit or two-digit SIC codes, averages for the period between 1983 and 1988, or averages for the entire period before FTA (1976-88).

passage of the FTA interacted with a dummy equal to one for the post-FTA period.<sup>18</sup> We assume that after 1989 all the tariffs were zero. Thus, the coefficient on  $Tariffs\ cut\ (Imports)_{jt}$  measures how ROA changed for the firms that were exposed to greater foreign competition due to the FTA. If competition indeed increased, we expect  $\beta_1$  to be negative. Moreover, if corporate governance improves the ability of firms to respond to an increase in competition, we expect  $\beta_1$  to be more negative for the firms that were incorporated in the states that passed BC laws, i.e. subject to worse governance.

As documented in Giroud and Mueller (2010), firms incorporated in the states with and without BC laws are different in many observable characteristics. We thus need to control for a number of confounding influences. Our specification includes year dummies,  $\alpha_t$ , and firm fixed effects,  $\alpha_i$ , to mitigate the scope for omitted factor bias. In addition, our vector of controls,  $X_{ijkt}$ , includes firm size, its squared term and firm age. We control for state linear trends to absorb the effect of secular geographic trends. In particular, we calculate the time-varying state of location averages of the dependent variable, excluding the firm in question when computing these averages. Moreover, we control for the one year lagged HHI to control for the domestic industry concentration.<sup>19</sup> Given that the main treatment is the reduction in industry tariffs due to the FTA, we cluster standard errors at the four-digit SIC code.

Our second approach, which we adopt as our baseline model, combines variations from both BC laws and FTA. While each policy taken separately measures the impact of, respectively, changing governance and competition, their interaction identifies the effect of exogenously worsening governance and subsequently increasing foreign competition on operating returns. We estimate the following regression:

$$ROA_{ijkt} = \alpha_i + \alpha_t + \beta_1 Tariffs\ cut(Imports)_{jt} + \beta_2 Tariffs\ cut(Exports)_{jt} + \beta_3 BC_{kt} + \beta_4 BC_{kt} * Tariffs\ cut(Imports)_{jt} \gamma' X_{ijkt} + e_{ijkt}$$

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<sup>18</sup> Following Guadalupe and Wulf (2010), we compute the pre-FTA import tariffs using four-digit SIC averages for the period between 1986 and 1988 as the baseline treatment. As robustness checks, we use alternative procedures, such as averages based on three-digit or two-digit SIC codes, averages for the period between 1983 and 1988, or averages for the entire period before FTA (1976-88).

<sup>19</sup> In unreported analyses, we have tested alternative specifications. First, our results are also robust to the inclusion of the squared firm age. Second, we have adopted a more comprehensive specification that controls for the leverage and/or cash holdings. Although our results are robust to the use of such controls, we prefer not to include them in our baseline regressions as they are likely to be affected by the FTA on the left-hand side. Third, we have included the squared drop in the import tariffs and its interaction with BC laws. While our main results remain largely unchanged, such squared terms are insignificant, thus providing little support to the existence of a non-linear effect of the drop in the import tariffs on operating returns.

where  $BC_{kt}$  is a dummy equal to one if the firm's state of incorporation  $k$  has BC laws in year  $t$  and zero otherwise while other variables are defined as in the previous equation. If BC laws have indeed a negative effect on corporate governance that translates into lower operating returns, we expect a negative  $\beta_3$ . The coefficient of our key variable of interest  $BC_{kt} * Tariffs\ cut\ (Imports)_{jt}$  measures how the negative effect of BC laws varies depending on the subsequent exposure to the cut in import tariffs. The null hypothesis for  $\beta_4$  is that an increase in foreign competition affected firms' returns uniformly, irrespective of their governance, i.e.  $\beta_4 = 0$ . We expect a negative  $\beta_4$  if worse governance is a factor that makes firms less able to react to the increase in competition.

As before, our specification includes year dummies, firm fixed effects, firm size and its squared term, firm age, one year lagged HHI and state-level trends. Importantly, given that the main effect of interest, the interaction between the FTA and BC laws, is identified at the intersection between incorporation states and industries, we can augment the specification with industry-level trends. As robustness checks, we follow Guadalupe and Wulf (2010) and further control for pre-existing industry characteristics that are typically related to the trade protection: skill intensity, capital intensity and TFP growth<sup>20</sup>; we also include the interaction between these variables and the post-1989 dummy.

Following Giroud and Mueller (2010), we cluster the standard errors by the state of incorporation, which accounts for arbitrary correlations of residuals across different firms in a given year and state of incorporation, across different firms in a given state of incorporation over time, as well as for the same firm over time. However, our findings are robust to alternative clustering methods such as those at the industry level, two-way clustering at industry and state of incorporation level, firm level, or by block-bootstrap as proposed in Bertrand et al. (2004).

## 4. Operating performance

### 4.1 Baseline results

Table 4 reports the effect of the FTA on operating returns for two separate subsamples: firms incorporated in the states with and without BC laws. For firms subject to BC laws (Columns 1-3), our estimates indicate that an increase in competition lowered corporate profits, as suggested by the negative and significant (at 5% or 10% level) coefficient of the cut in import

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<sup>20</sup> Industry controls come from the NBER-CES Manufacturing Industry Database. We compute these controls as our main tariffs, i.e. by taking the averages for the period 1986-1988 and interacting them with a pre-FTA dummy.

tariffs. By contrast, we find that the cut in import tariffs does not have a statistically significant effect on the ROA of firms that are not subject to BC laws (Columns 4-6). The economic magnitude of the coefficient for these firms is also much smaller than the one obtained for the firms subject to BC laws, and the coefficients obtained for the two subsamples are statistically different from each other at 1% level.

In Table 5, we present results for the full specification that includes BC laws, a cut in import tariffs and the interaction between them. First, to validate the idea that BC laws indeed represented a negative shock to corporate governance that harmed efficiency and, in turn, operating returns, we consider the BC law dummy (Column 1). Results, in line with Bertrand and Mullainathan (2003), confirm a negative effect of BC laws on profitability. Consistent with the view that the FTA increased foreign competition for U.S. firms, we also find that the coefficient of the reduction in import tariffs is negative and significant; for the firms exposed to the average cut (i.e. 0.04), ROA dropped by 1.1%, where the average ROA in our sample is 6.7%.<sup>21</sup>

In Columns (2)-(3), we provide our main test by including the interaction between BC laws and import tariffs cut. The coefficient of this interaction term is negative and statistically significant at 1%, whereas the cut in import tariffs by itself is not statistically significant. The drop in ROA for the firms incorporated in the states with BC laws and exposed to the average cut in import tariffs was 1.85%. The increase in competition thus affected operating returns only for the firms with the recently worsened corporate governance.

In Column (4), we add the variable measuring the reduction in export tariffs and its interaction with BC laws, to control for the fact that the FTA also reduced export tariffs to Canada. Our estimates indicate that the interaction between BC laws and reduction in import tariffs remains negative and statistically significant, while the interaction between BC laws and export tariffs cut is not significant at the conventional levels. For the average firm, our findings are thus driven by the increase in foreign competition in the U.S. domestic markets rather than the improved ability to export to Canada. However, in Section 4.4 we examine how this result varies by splitting the sample between exporters and non-exporters.

Overall, our findings indicate that foreign competition reinforces the negative effect of worse governance on operating returns. We next explore the robustness of this result in a number

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<sup>21</sup> We provide further support to the idea that the FTA had a negative impact on accounting performance by using the price-cost margin as the dependent variable. Unreported results confirm the evidence in Guadalupe and Wulf (2010) that a greater exposure to import tariffs cut indeed caused a greater reduction in the price-cost margin.



of tests. We start with examining whether import tariffs in fact proxy for some inherent industry characteristics. We then look into whether the parallel trend hypothesis holds, and also exclude firms incorporated in Delaware as well as multi-segment firms. Finally, we provide alternative computations of standard errors, dependent variables, and ways to deal with outliers.

## **4.2 Industry characteristics**

One concern is that the effect of BC laws could differ across industries for reasons other than competitive pressures. The reduction in import tariffs could, in fact, capture some inherent differences across industries that are typically correlated with the protection from foreign competitors. To tackle this issue, we control for a number of industry characteristics as well as for their interaction with the BC law dummy. As we show in Table 6, Panel A, the inclusion of these controls does not substantially affect our results.

First, industries that are the least competitive globally might be protected with higher import tariffs and at the same time be the most affected by the worsening corporate governance. We thus control for a time-invariant measure of the average import tariffs that a firm faced before the FTA. Such variable is related to the static characteristics of the industry such as its global competitiveness. A statistically significant coefficient for the interaction between BC laws and this variable would suggest that the least efficient industries are the most affected by the worsening corporate governance. We report the results in Column (1). Since this coefficient is not statistically significant while the interaction between BC law and the reduction in import tariffs remains significant, the negative effect comes from the changes in competition rather than static industry characteristics.

Second, we provide a specification where we include the interaction between BC laws and lagged HHI to control for the different effect of BC laws in concentrated and competitive industries, as documented in Giroud and Mueller (2010). In Column (2) we confirm a negative and significant effect for the interaction between BC laws and increased foreign competition. The latter result also holds if HHI is estimated contemporaneously.

Third, in Column (3), we follow Guadalupe and Wulf (2010) and include a set of the pre-FTA industry characteristics that are typically related to trade protection: skill intensity, capital intensity and TFP growth over 1986-1989, as well as their interaction with the post-FTA dummy. These controls allow us to further absorb the effect of observable industry differences related

with the magnitude of the tariffs cut. We do not find that any of these controls significantly affect our main findings. Finally, in Column (4), we include all controls separately used in Columns (1)-(3) and again find a significant effect for our coefficient of interest.

### **4.3 Further robustness checks**

In Table 6, Panel B, we assess the robustness of our findings in a number of additional ways. An important concern with our identification strategy would be if the parallel trend hypothesis concerning the implementation of BC laws and the FTA was violated. Previous literature already offers arguments to support the abrupt adoption of both BC laws and the FTA. Romano (1987), who investigated the adoption of BC laws from a political viewpoint, claimed that this legislature was typically lobbied by a single firm facing an imminent takeover threat rather than a larger coalition of firms. That BC laws were pushed by a few select firms and often adopted during emergency sessions should weaken the endogeneity concern (Bertrand and Mullainathan 2003). Moreover, the passage of the FTA was highly improbable and unexpected (Guadalupe and Wulf 2010). Its fate was decided in the Canadian general election, which was won by the Conservative party, in favor of the FTA, after trailing in the polls to the Liberal party that opposed the agreement (Morck et al. 2000). Empirically, we address these concerns by estimating placebo policy changes three years before their real passage (Columns 1 and 2). Results indicate the placebo BC laws or the FTA are not statistically significant and also economically less pronounced than our baseline finding in Table 5, Column (1). These results confirm that our data do not show pronounced diverging trends which could confound our findings.

An additional concern of our specification is that our control variables such as firm size might themselves be responsive to the policy changes or correlated with omitted factors. Thus, in Column (3) we provide the results from a specification that only controls for the time and firm fixed effects.

Moreover, as shown in Table 1, most of the firms in our sample are incorporated in Delaware. Our results could thus proxy for some non-governance related changes in the legislature of Delaware-incorporated firms. However, Column (3) reports that our findings are also robust to the exclusion of firms that were incorporated in Delaware.

Also, our treatment measuring the reduction in import tariffs relies on the correct assignment of firms to industries. Since we only use the primary segments reported in Compustat for each

firm, the FTA treatments might suffer from measurement errors for firms with multiple segments. To address this concern, we restrict our analysis to the single-segment firms, as inferred from the number of segments with reported sales in the Compustat Segments database. Results in Column (4) indicate that the interaction between BC laws and reduction in import tariffs is economically relevant and statistically significant at the 10% level.

Additionally, we address the issue of the timing of BC laws. Our baseline results (Table 5) estimate the interaction of an increase in competition with BC laws regardless of whether the BC laws were already implemented at the time of the FTA or were passed after the FTA. As shown in Figure 1, seventeen states (70.6% of firms in our sample) passed BC laws before the FTA, eight states did so in 1989, while five states passed BC laws in 1990-1991. Since we aim to identify how a change in governance affects the response to a subsequent change in competition, including the few states that passed BC laws after the FTA could bias the analysis. Therefore, we exclude firms incorporated in states that passed BC laws in 1990 and 1991. Our results, shown in Column (5), are robust to this analysis.

We also provide alternative computations of the standard errors. We estimate our baseline regression by clustering at the four-digit industry level (Column 6), to allow for intra-industry correlation of residuals induced by the FTA. We adopt treatments on two different dimensions and we are interested in the interaction between the two; thus, since our specification is identified at both industry and incorporation levels, we adopt a two-way clustering at the industry and state of incorporation level (Column 7). In untabulated regressions, we also cluster residuals at the firm level or at the state of location level. Although the precision of our estimates varies, the interaction between BC laws and reduction in import tariffs remains statistically significant at conventional levels. The interaction coefficient remains significant at 5% level even if we compute standard errors by block-bootstrap using 200 replications (Bertrand et al. 2004).

Finally, we adopt several ways to deal with outliers. In our baseline estimates, we trim 1% at each tail of the ROA distribution. However, our results are similar if we exclude firms with assets below \$1 million, if we trim 1% at each tail of the distribution of total assets, and if we estimate a median regression (including industry fixed effects and bootstrapping standard errors using 100 replications). Similarly, our results are robust to the adoption of alternative measures of performance such as net profit margin (computed as EBITDA divided by sales), or ROA after

depreciation (computed as operating income after depreciation divided by total assets), or ROE (computed as EBITDA divided by book value of common equity).<sup>22</sup>

#### 4.4 Firm characteristics

We now explore whether our effect is stronger for firms that should have been affected more by the FTA. First, we show that the results differ between exporters and non-exporters. Second, we check whether less productive firms were hurt most. Finally, we find that our effect is present mainly among the firms that are more closely located to the Canadian border.

First, we distinguish between exporters and non-exporters (Table 7, Panel A, Columns 1 and 2). We expect the results to differ for two reasons. First, exporters might have benefited from the increase in business opportunities to Canada created by the reduction in export tariffs. Second, exporting firms are typically associated with a high level of productivity (e.g. Clerides et al. 1998, Bernard and Jensen 2004, Delgado et al. 2002), so the effect of import tariffs should be lower for these firms.<sup>23</sup>To account for both effects, we estimate separate regressions for exporters and non-exporters including both import and export tariffs reduction together with their interaction with BC laws.

For exporters, we find that the reduction in import tariffs is not significant. By contrast, the reduction in export tariffs is positive and significant, suggesting that exporters were able to benefit from the cut in export tariffs to Canada. Moreover, we find that the interaction between the cut in export tariffs and BC law has a negative coefficient of almost similar size. This result suggests that exporters were positively affected by the FTA but worse corporate governance impaired their ability to benefit from better export opportunities in Canada. Turning the attention to non-exporters, we find that export tariffs cut and BC law are not significant at conventional

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<sup>22</sup> We conduct a number of additional robustness checks that are available upon request. First, we compute the average tariffs for the entire period before the FTA was passed (from 1976 to 1988). In computing the average tariff for the pre-FTA period, we had to exclude one industry in 1978 which reported an implausibly large tariff. Second, we restrict the sample to firms that are present during the entire period from 1981 to 1995 (four years before the first BC law until four years after the last BC law), to purge the sample of entry and exit effects (Giroud and Mueller 2010). The interaction of interest is economically close to our baseline finding, although its significance is reduced to 14% level, likely due to a smaller sample size. Third, we adopt a symmetric window around the FTA passage (1982-95). Fourth, we restrict the analysis to manufacturing sectors (SIC between 2000 and 4000). Fifth, we only consider the cases with non-extreme tariffs cut (larger than 0% and smaller than 8%). Sixth, we control for the firm's distance to Canadian border as well as its interaction with the BC law dummy. Results confirm our previous findings, both in economic and statistical terms.

<sup>23</sup> Another reason why exporters might have experienced a lower impact from the reduction in tariffs is that the inputs that they use for their production are more likely to be imported (Bernard et al. 2009), so they are more likely to gain from the reduction in import tariffs on their supplies.

levels. However, the interaction between BC law and import tariffs is significant at the 10% level and economically large. Thus, non-exporting firms were negatively affected by the FTA mostly through the increase in competition, and such negative impact was particularly high in poor corporate governance environments. Importantly for our identification, the firms in our sample do not change their exporting status after 1988, i.e. there is no effect from the FTA on the extensive margin to export.

We continue by estimating regressions on subsamples based on different levels of firm-level productivity and stages of development. Models of trade integration with heterogeneous firms (Melitz 2003) suggest that only low-productivity firms are negatively affected by trade liberalization. Moreover, low productivity firms have higher ex ante probability of being taken over because of higher potential efficiency gains (Maksimovic and Phillips 2001). Thus, a reduced takeover threat after BC laws should have affected them more negatively than high productivity firms. We test whether the negative effect of the interaction between BC laws and trade liberalization on operating returns is most prevalent among low-productivity firms.<sup>24</sup>

We use the firm size and age as our first indirect measures of firm-level productivity and sort our sample according to these variables to construct two separate subsamples. In Table 7, Panel B, Columns (1) and (2), we estimate separate regressions for firms that are smaller or larger than their industry peers. Small (large) firms are defined as firms having assets below (above) the industry median in 1984, one year prior to the passage of the first BC law. We find that for larger firms the impact of BC laws is close to zero and insignificant, again perhaps because large firms were already difficult to take over. By contrast, the BC laws caused a large and negative effect on ROA for smaller firms. While the coefficient of the interaction between BC laws and the FTA is negative and significant at conventional levels for both large and small firms, its economic magnitude is much larger for smaller firms. This result indicates that smaller firms subject to worse corporate governance were the most hurt by an increase in competition. Columns (3) and (4) report similar results for younger and older firms, defined again relative to the industry medians in 1984.

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<sup>24</sup> BC laws affect firm-level productivity directly (Bertrand and Mullainathan, 2003). We thus sort the firms according to their productivity before the first BC law was passed, in 1984.

We also measure firm-level total factor productivity (TFP) more directly by following the semi-parametric procedure developed in Olley and Pakes (1996).<sup>25</sup> Then, we estimate separate regressions for subsamples of firms with lower and higher TFP than their industry peers in 1984 (Columns 5 and 6). While the interaction between BC laws and import tariffs cuts is negative in both subsamples, the economic magnitude is more than twice as large for the subsample of low TFP firms. Our findings thus indicate that low productivity firms, that were most exposed to the increase in competition and that were more influenced by the reduction in takeover threat, suffered from the FTA more than the other firms and especially so if they were subject to BC laws.

Finally, we explore how our results vary depending on the geographic proximity to the Canadian market. Gravity models of international trade imply that the intensity of trade decreases with the distance between the trading partners. We thus expect the effect of the FTA to be stronger for firms that operate closer to the Canadian border. As BC laws were introduced at the state of incorporation level, we avoid spurious correlation between distance and the quality of governance. We measure proximity to Canada by the distance from the largest city in the state of location to the closest road crossing of U.S.-Canada border. We then split the sample according to whether the firms are located closer or further than the median distance to Canada (300 miles), and analyze separately the effect of BC laws and reduction of import tariffs for both subsamples of firms (Columns 7 and 8). We find that the combined effect of tariff reduction and BC laws is only statistically significant and economically larger for the firms located closer to the Canadian border.

#### **4.5 Alternative measure of corporate governance**

In addition to using BC laws to identify variations in corporate governance, we provide evidence that the FTA had a higher negative effect on the worse-governed firms using a firm-level measure of corporate governance. Hartzell and Starks (2003) find that institutional ownership concentration is associated with higher pay-for-performance sensitivity and lower executive compensation, which in turn reduce the agency problems between the shareholders and management. Moreover, Ferreira and Matos (2008) show that institutional investors invest into

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<sup>25</sup> Our results are robust to computing TFP as Solow-residuals from a Cobb-Douglas production function estimated with OLS (untabulated).

the firms with a better governance. Nikolov and Whited (2009) further claim that, due to the measurement problems in other proxies, institutional ownership is a preferred proxy for firm-level corporate governance. Following these studies, we adopt the fraction of institutional ownership in the firm as proxy for the quality of corporate governance within the firm. We estimate an equation where we interact *Tariffs Cut (Imports)<sub>ij</sub>* and the fraction of institutional ownership in the firm's stock. Controlling for the firm fixed effects allows us to look at within-firm variation in institutional investor ownership. We find that the coefficient of institutional ownership is 0.064, the coefficient of *Tariffs Cut (Imports)<sub>ij</sub>* is -0.3687 and the interaction term is 0.9575, all significant at 1% level.

While this result is in line with our previous findings and confirms that an increase in the foreign competition primarily lowered the profits of firms with worse corporate governance, these estimates are plagued by omitted factor bias. Thus, we prefer the passage of state-level BC laws as our identification of exogenous changes to the corporate governance.<sup>26</sup>

#### **4.6 Alternative measure of import competition**

We adopt import penetration at the industry level as an alternative measure of import competition, and estimate an equation where we interact import penetration and the dummy indicating the passage of BC laws.

Import penetration is defined as the ratio of imports over imports plus domestic production in a given industry and a given year. Since import penetration can be endogenous to the profitability in the industry, following Bertrand (2004) we instrument it with the weighted average of the real exchange rates of the importing countries. In particular, the weights for each industry are the shares of each foreign country's imports in the total imports of that industry. As in Bertrand (2004), we fix the shares of foreign country's imports as they were in 1981. We use both the current and one-year lagged weighted real exchange rates as instruments for import penetration and interaction of the exchange rates with BC law as an instrument for the interaction of import penetration with the BC law.

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<sup>26</sup> We also estimate our baseline specification for two subsamples of firms: those that report any institutional ownership in 1984 and those that report none. Our results on the interaction of BC laws and *Tariffs cut (import)<sub>ij</sub>* only holds for the subsample with no institutional ownership. Such finding is consistent with the prediction that BC laws mainly affected bad governance firms to begin with.

We find that the coefficient of import penetration is 2.2827, the coefficient of BC law is 0.0982 and the interaction term is -0.8743. Although the level variables are not significant at the conventional levels, the interaction term is significant at 6%. These findings again reconfirm that changing foreign competition is mainly affecting the profitability of the firms with worse corporate governance. However, we prefer to rely on the FTA since it provides more exogenous variations in competition from imports.

## **5. Market values**

We complement our results on operating performance by studying the stock market reactions to the FTA. If corporate governance indeed reduces the ability to react to competition, the market value of the stock should be lower for firms with worse corporate governance. We first provide results for the annual panel of market to book ratios. We then conduct an event study on how the announcement of results of Canadian general elections, which significantly increased the probability of adopting the FTA, affected the stock prices of U.S. firms.

### **5.1 Market to book ratios**

Our first dependent variable is the ratio of the market value of equity to the book value of equity. The results are reported in Table 8. In Column (1), we report estimates using same controls as in the ROA regressions. We find that the coefficient of the interaction between BC laws and tariffs cut is negative and significant: firms exposed to the worse governance experience a decrease in the market value after the competition increases. In Columns (2)-(4) we sequentially include other controls which are typically associated with the market value, such as ROA, leverage and R&D expenditures to sales. To reduce the concern that these controls are simultaneously affected by the FTA on the right-hand side, we use one-year lagged values. In Column (5), we include all controls together. Again, our estimates indicate a significant decrease in the market value of firms incorporated in worse-governance states and subject to an increase in competitive pressures.

A consistent finding on the market values also eliminates an additional concern regarding our results on profitability. One could argue that firm's investment may follow decreasing returns to scale and thus the firm could continue expanding while the average ROA drops. If either the passage of BC laws or the removal of import tariffs increases the size of such firm, we



could have misinterpreted our findings. However, a drop in the market value of the firms that are incorporated in the states with BC laws contradicts this interpretation of the profitability results.

## 5.2 Event study

Accounting-based measures can be manipulated as a response to worsened corporate governance and the competitive shock. Moreover, the annual panel data cannot fully absorb the endogeneity of the phase-out of tariffs. To mitigate these concerns, we perform an event study to test whether the adoption of the FTA had a different immediate impact on the stock prices of the U.S. firms incorporated in states with and without BC laws. Morck et al. (2000) and Breinlich (2010) provide a summary of political events that were relevant for the implementation of the FTA and claim that the likelihood that the agreement was adopted has strongly increased after the Conservatives won the Canadian general election on November 19, 1988. The outcome of the election was highly uncertain. A Gallup poll published two weeks before the election, on November 7, still showed a 12% lead in favour of the Liberal party, the major party in the Canadian political scene that opposed FTA's implementation. This uncertainty surrounding the elections offers an ideal context to conduct an event study that examines the U.S. stock market reaction to the FTA.

First, as all firms within the same industry are affected to a similar extent and thus their abnormal returns are likely to be correlated (MacKinlay 1997), we form industry-level portfolios. Second, for each of these portfolios we estimate cumulative abnormal stock returns over a few event periods around the election date: [-20,-1], [-5,-1], [-1,0], [0,0], [0,1], [0,3], [0,5], where [-1,0] is the two-day event window. Cumulative abnormal returns (CARs) are calculated as the difference between actual holding returns, as extracted from CRSP, and expected returns, projected using a market model with the parameters estimated from 241 to 41 trading days prior to November 19, 1988. We then test whether the average CARs of these 326 industry portfolios are statistically different from zero for each event window.

We report the results in Table 9. In Columns (2)-(4), we confirm that a larger reduction in tariffs led to a drop in stock prices, a finding which adds to validating our identification strategy. A six day return was -1.25% for the firms operating in industries subject to a large tariffs cut and it was not significant from zero for the other firms.

Furthermore, in the same manner as the industry portfolios, we form portfolios at the state of incorporation level, estimate cumulative abnormal stock returns over the same event windows and test whether the average CARs of these state-level portfolios are statistically different from zero for each event window. In Columns (5)-(7), we document that firms incorporated in the states subject to BC laws had a larger drop in stock prices. A six day return was -1.44% for the firms subject to BC laws and not significant from zero for other firms. Overall, the event study evidence confirms our previous findings that firms incorporated in worse corporate governance environments were less able to face an increase in competitive pressures.

## **6. Why governance matters?**

We have so far shown that worse corporate governance amplifies the negative effect of an increase in competition on operating and stock market performance. We now look at one particular reason why corporate governance is important for how the firms react to the increase in competition – a close relationship between corporate governance and the ability to raise external finance.

We follow four steps. First, we investigate whether firms exposed to both BC laws and cuts in import tariffs raised less external finance. We then link these results to our findings on profitability at the firm level. We check whether firms that were dependent on external finance were more affected by the trade shocks. Moreover, we investigate one particular case – a sharp spike in oil prices during the Gulf War in 1990. As the oil price spike unexpectedly drained resources of firms with negative exposure to oil prices, this event provides an exogenous variation for the need of external finance. We find that ROA was primarily affected by firms exposed to BC law, trade shock and oil price spike. Finally, we provide some industry-level evidence on domestic product prices. We show that price pressure of the tariffs cuts differed across industries according to how much external finance they raised just after the FTA.

### **6.1 External finance**

Since an increase in competition requires firms to reorganize their activities, the access to external finance may play an important role in adapting to the FTA. Rajan and Zingales (1998) show that as an industry becomes more dependent on external finance, the availability of outside capital becomes more important. Also, higher credit constraints limit a firm's ability to react to

trade liberalizations (Manova 2008). Yet we know that the quality of corporate governance determines at what terms firms can raise external funds (Jensen and Meckling 1976) and agency problems increase the cost of external finance (Myers and Majluf 1984).

We now look at the issuance of new external capital. Table 10, Column (1), provides the estimates for the main specification where the dependent variable is the total net change in capital as the fraction of firm's book value of assets. In addition to the usual explanatory variables adopted in the profitability regressions, we control for the start-of-year leverage.<sup>27</sup> We also control for the general issuance activity by industry and state of location. First, we show direct evidence that being subject to BC laws cuts fund raising.<sup>28</sup> Moreover, this reduction becomes larger when firms face higher needs to raise financing in order to absorb the trade shock. When experiencing a reduction in import tariffs (and presumably higher capital needs), firms in states with BC laws exhibit lower new financing compared to firms in states without BC laws. In Columns (2) and (3), we also report separate results for the net changes in equity and debt. As expected, since BC laws mainly exacerbate agency problems between managers and shareholders (rather than managers and creditors), the results are stronger for net changes of equity.

As a robustness check, we collect data on the new capital raised from the SDC New Issues dataset. In particular, we consider all types of securities (bonds, secondary equity offering, or other type of securities) that the firm issues over the year and that are reported in SDC New Issues dataset.<sup>29</sup> Our main dependent variable is the proceeds from the issue of securities as a fraction of the total assets in the preceding year. We restrict this variable between 0 and 1. If SDC New Issues does not report data on issuances for a particular firm, we consider that no issuances have been made. Estimates, reported in Columns (4)-(6), confirm the previous results; a firm is less likely to raise financing after a large tariffs cut if it is incorporated in a state with a BC laws. In fact, firms incorporated in states without BC laws increase their raising of external finance as a consequence of a higher cut in import tariffs.

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<sup>27</sup> Our results are robust to the adoption of a less restrictive specification which includes industry instead of firm fixed effects.

<sup>28</sup> Consistent with this argument, Qiu and Yu (2009) find that the cost of new debt rose after the passage of BC laws.

<sup>29</sup> One concern is that SDC New Issues does not report borrowing from banks, so even if firms with worse corporate governance raise less capital from the publicly listed securities, they could substitute it with more private debt from the banks.

The interpretation of our results can be either that the supply of finance is more constrained for firms with worse governance, or that the managers of these firms might demand less external finance. Although we are not able to distinguish between supply and the demand effects, and thus between financial constraint and quiet life explanations, our findings indicate that corporate governance plays an important role in mediating the use of external finance in response to an increase in competition.

## **6.2 Linking external finance and performance**

So far we have established that the interaction of foreign competition and corporate governance affects the profitability of the firm, its market value and the raising of external finance. In this section, we link the results on the external finance to our previous findings on operating performance. First thing to notice is that we see a positive association in our sample between ROA and raising of external finance. In untabulated results, consistent across two measures of external finance and holding the firm effects fixed, we find a positive association significant at 1%.

Second, we look at whether the effect on profitability was mainly present among the firms that were dependent on external finance. If firms rely on external finance to face the FTA and external finance is related to firm profitability, we expect a drop in external finance to correspond to a negative effect of our governance and trade shocks on profitability. On the contrary, if the firm does not rely on external finance, even if the shock had an effect on the ability of the firm to raise it, this would not transmit into the profitability.

We inspect this association in more detail. We check whether indeed firms that operated in the industries that have a precedence of raising external finance suffered more in terms of operating performance.<sup>30</sup> We classify firms based on whether the industry in which they operated was above or below the across-industry median in 1984, one year prior to the passage of the first BC law, in terms of the external financial capital that they raised.<sup>31</sup> In essence, our measure is similar to Rajan and Zingales' (1998) proxy of industry financial constraints.

We first sort the sample according to industry's net change in capital in 1984 based on the balance sheet measures (as in Table 10, Column 1). Our previous result that trade liberalization

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<sup>30</sup> We find similar results if we adopt the MB ratio as the dependent variable.

<sup>31</sup> The average import tariffs are not statistically different between neither of the pairs of subsamples studied in this section.

negatively affected ROA of the firms incorporated in BC states holds only in the subsample of firms with high activity of raising external finance. We confirm these results by using the security issuances reported in the SDC New Issues database (as in Table 10, Column 4). Results, reported in Table 11, indicate that the negative effect of a reduction in import tariffs on the operating returns was mainly concentrated among firms that both were incorporated in the states with BC laws and operated in the industries with high issuance of external finance.

Taken together, these results suggest a close positive association between the increases in external finance and operating returns predicted by the firm response to the two policy changes.

### **6.3 Exogenous variations in financing needs**

We further explore an additional exogenous variation in the financing needs of U.S. firms. We look into the Gulf War that started with the invasion of Kuwait by Iraqi armed forces on August 2, 1990, and resulted in a spike of oil price which only ended after U.S. military action in January, 1991. We claim that firms that were negatively exposed to oil prices, e.g. because of their costs tied to oil, experienced an unexpected drain of resources because of the oil price spike. Our analysis is related to that of Lamont (1997) who explored the corporate effects of the oil shock of 1986.

In this analysis we exploit the fact that the trade shock was not yet fully absorbed by U.S. firms and thus an abrupt change in their need for external finance should have strengthened a negative effect on ROA from the FTA for the firms that had higher financial constraints. We look whether the effect on ROA in 1990 was stronger for firms that experienced a combination of (1) large tariffs cut; (2) incorporation in the states with BC laws; (3) negative exposure to the oil price shock. If the interaction between BC laws and tariffs cut had no effect on the need for finance, we would expect that the triple interaction to be not significant.

We estimate the firm's exposure to the oil prices by estimating the correlation of daily returns on the firm's stock price and the changes in the WTI crude oil spot price in year 1989. In doing this we follow Adler and Dumas (1984) who suggest inferring firm's exposure to currency risk from how its stock price correlates with the exchange rate changes. For the sake of easier interpretation, we use a negative value of this correlation coefficient as the firm's exposure to the oil price spike. We then interact this term with our two policy changes. We perform the analysis on a smaller sample of firms because of the need of continuous stock price data. We find a

negative and statistically significant (at 5%) effect on ROA for the firms that needed finance most (because of the trade shock and oil spike) and were least able to raise it (because of BC laws). We thus conclude that BC laws had a negative effect on the ability to raise external finance and that hampered the ability of firms exposed to them to react to the trade shock.

#### **6.4 External finance and product prices**

One implication of the channel through which we explain our results is that industries that raised more capital after the FTA experienced smaller price pressure from the increased foreign competition. In fact, resisting predatory attacks should have resulted in a stable price level (Benoit 1984). On the contrary, industries that did not increase capital (presumably, because of worse corporate governance) in the face of a tariff drop should have seen a corresponding decrease in the price level.<sup>32</sup> As shown by Chevalier (1995), financial constraints of some players can lead to predation by their rivals and thus subsequent fall in the price levels.

To shed light on this issue, we look into the impact of the FTA on the Producer Price Index<sup>33</sup> (PPI) of each four-digit SIC industry. We retrieve industry-level PPI from the Bureau of Labor Statistics and use the annual average as our variable of interest. We regress PPI on *Tariffs cut (Imports)<sub>ij</sub>*, controlling for industry and time fixed effects, as well as for the four-digit industry HHI computed by the U.S. Census on the universe of private and public firms. For the sake of our analysis, we retrieve the HHI for the years 1977, 1982, 1985 and 1992, and we replace values for the missing years using the values from the last year available. Our goal is to investigate if the effect of the FTA on prices differs according to the amount of capital raised by the firms (both private and public) in each industry, as retrieved from SDC New Issues database. We normalize the capital raised by the size of industry that we proxy with the value of total shipments in the industry in that particular year. In Table 12, Columns (1) and (2), we adopt two subsamples created using the total amount of new capital raised between 1989 and 1995 and normalized by the value of total shipments in the industry in 1989. We find that the negative reaction of the FTA on the price level was only present in the industries that raised less capital. In particular, an average cut in tariffs of 4% resulted in about 0.5% drop in the prices of domestic

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<sup>32</sup> In other words, pricing is the investment of new entrants into the market share (see, for instance, Klemperer 1995).

<sup>33</sup> We prefer to use PPI rather than CPI since, in contrast to the CPI, PPI only takes into account prices charged by the domestic firms. PPI also excludes any taxes while CPI measures the final prices faced by the consumer.

producers in the industries that did not raise capital. Such evidence thus shows that across industries there was a link between financing and the price pressures after the FTA.

One concern could be that firms in some industries might have had high rents pre-FTA and they accumulated these rents over time without a need to raise external finance. Although the FTA could have reduced them via the price pressure, these firms still did not need to raise additional capital. We expect such case to be prevalent in more concentrated industries. Although this concern is already mitigated in Columns (1) and (2) by the inclusion of the HHI as the control variable, in Columns (3)-(6), we conduct the same analyses further splitting the sample into concentrated (above the median HHI) and competitive (below the median HHI) industries. Our results indicate that the effect of the FTA on the price level is only present in the sample of low external finance raising and competitive industries, thus going against this alternative explanation.

Overall, these results are consistent with the idea that the financing channels are an important mechanism driving our main finding since they were related to how an industry reacted to the FTA. As corporate governance is closely related to financial constraints, it affects individual firms' reactions to an increased foreign competition.

## **7. Conclusion**

We investigate how the quality of corporate governance affects a firm's performance after an increase in foreign competitive pressures. Our empirical approach is based on the intersection of two policies implemented in the U.S. at the end of 1980s. On the one hand, BC laws reduced the threat of hostile takeovers, thus making ineffective an important corporate governance device – the market for corporate control. On the other hand, the Canada-U.S. FTA increased foreign competition for U.S. manufacturing firms as tariffs on Canadian imports were abolished. We adopt a combination of difference-in-differences models based on the observation that states passed BC laws at different dates (primarily before the FTA), whereas industries experienced different cuts in import tariffs, and thus a different increase in foreign competition, due to the FTA.

Our main finding is that foreign competition reinforces the negative effect of worse governance on operating returns and stock prices. The exposure to BC laws and subsequent average cut in import tariffs caused a 3.8% drop in ROA. Furthermore, we find that the negative

effect of BC laws on operating returns is predominantly concentrated among small firms, young firms, low-productivity firms, and firms located closer to the Canadian border.

We explain this evidence by the need to raise external finance in response to the increase in competition. Indeed, our results indicate that worse corporate governance reduces the capacity to attract external finance after the competition strengthened. Our evidence may be also consistent with a quiet life notion that managers exposed to worse governance are unwilling to undertake actions needed to face the increase in competition. While testing these alternative views is out of the scope of the paper, our findings consistently indicate that corporate governance has a positive influence on the ability to compete in the product market.

An increase in firm-level productivity after the competition strengthens can stem either from a uniform rise in productivity by all firms, or from forcing the least efficient firms exit the market. Worse-governed firms could be thus less able to adjust their actions or alternatively they might have a higher ex ante probability of being taken over or going bankrupt. Our findings focus on the worse-governed firms improving less than their peers.<sup>34</sup> However, future research could further discriminate between these two explanations and explore the role of other corporate governance mechanisms.

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<sup>34</sup> In fact, we observe somewhat more bankruptcy filings in the states with BC laws after the FTA. Data from BankruptcyData.com and UCLA-LoPucki's Bankruptcy Research Database says that in our sample there were 8 filings for Chapter 11 for firms incorporated in states with BC law (0.24% of the firms in our sample) versus 20 filings in states without non-BC law (0.14%) over 1983-1988. However, over the period of 1989-1993 we observe 94 filings in states with BC law (0.70%, an increase of 2.9) versus 9 filings in states without BC law (0.37%, an increase of 2.6). Such anecdotal evidence suggests that FTA might have increased the complete exits of firms with worse corporate governance more than of those with the better governance.



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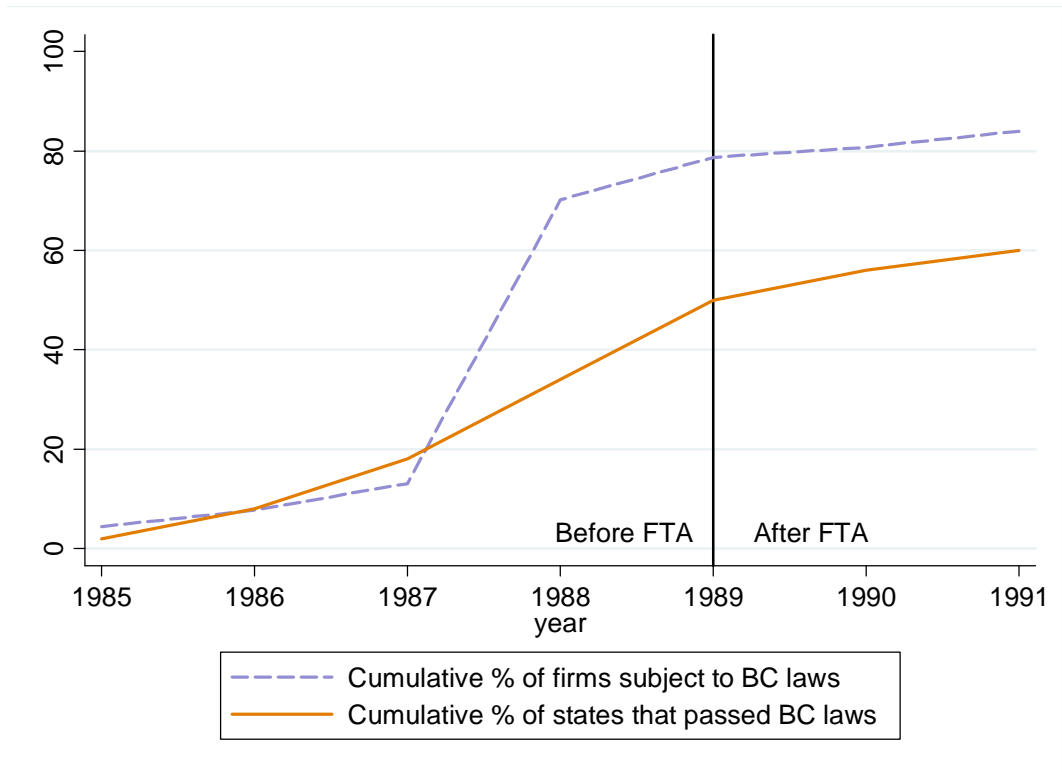
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# Figure 1. Sequence of BC law passages around the FTA

This graph shows the cumulative number of states and firms subject to BC laws. The vertical line in 1989 indicates the passage of the FTA.



**Table 1. States of incorporation and states of location**

This table shows the number of firms by state of location (state in which a firm's headquarter is located) and incorporation. BC year indicates the year in which a Business Combination law was passed.

State	BC year	State of incorporation	State of location	Number (%) of firms incorporated in					
		Number of firms	Number of firms	State of location	(%)	Delaware	(%)	Other states	(%)
Delaware	1988	1956	5	5	100.0	0	0.0	0	0.0
California		199	667	184	27.6	423	63.4	60	9.0
New York	1985	158	297	103	34.7	173	58.2	21	7.1
Colorado		115	160	70	43.8	68	42.5	22	13.8
Minnesota	1987	112	138	96	69.6	37	26.8	5	3.6
Massachusetts	1989	103	199	87	43.7	102	51.3	10	5.0
Nevada	1991	89	18	7	38.9	6	33.3	5	27.8
Texas		83	359	65	18.1	220	61.3	74	20.6
Pennsylvania	1989	77	142	59	41.5	72	50.7	11	7.7
New Jersey	1986	74	200	56	28.0	115	57.5	29	14.5
Ohio	1990	65	117	54	46.2	53	45.3	10	8.5
Florida		55	132	42	31.8	66	50.0	24	18.2
Utah		43	37	23	62.2	10	27.0	4	10.8
Washington	1987	39	53	29	54.7	17	32.1	7	13.2
Michigan	1989	38	89	33	37.1	46	51.7	10	11.2
Virginia	1988	33	51	17	33.3	23	45.1	11	21.6
Maryland	1989	32	44	14	31.8	28	63.6	2	4.5
Wisconsin	1987	30	45	27	60.0	15	33.3	3	6.7
Indiana	1986	28	37	21	56.8	11	29.7	5	13.5
Georgia	1988	26	66	24	36.4	37	56.1	5	7.6
Oklahoma	1991	26	65	23	35.4	31	47.7	11	16.9
Oregon		26	41	21	51.2	12	29.3	8	19.5
Illinois	1989	20	146	14	9.6	117	80.1	15	10.3
Missouri	1986	17	41	10	24.4	23	56.1	8	19.5
Kansas	1989	14	24	10	41.7	7	29.2	7	29.2
North Carolina		14	44	11	25.0	25	56.8	8	18.2
Connecticut	1989	12	95	11	11.6	69	72.6	15	15.8
Tennessee	1988	12	29	9	31.0	15	51.7	5	17.2
Iowa		10	18	8	44.4	6	33.3	4	22.2
Wyoming	1989	8	4	2	50.0	0	0.0	2	50.0
Arizona	1987	7	44	6	13.6	29	65.9	9	20.5
New Mexico		6	8	3	37.5	2	25.0	3	37.5
Rhode Island	1990	6	15	6	40.0	7	46.7	2	13.3
South Carolina	1988	6	17	5	29.4	9	52.9	3	17.6
Louisiana		4	19	1	5.3	12	63.2	6	31.6
New Hampshire		4	19	2	10.5	12	63.2	5	26.3
Mississippi		3	8	3	37.5	4	50.0	1	12.5
Montana		3	5	3	60.0	1	20.0	1	20.0
North Dakota		3	2	1	50.0	0	0.0	1	50.0
Kentucky	1987	2	11	2	18.2	9	81.8	0	0.0
Maine	1988	2	2	2	100.0	0	0.0	0	0.0
South Dakota	1990	2	3	1	33.3	1	33.3	1	33.3
Hawaii		1	4	1	25.0	3	75.0	0	0.0
Idaho	1988	1	6	6	100.0	5	83.3	1	16.7
Nebraska	1988	1	6	1	16.7	4	66.7	1	16.7
Vermont		1	5	1	20.0	3	60.0	1	20.0
West Virginia		1	5	1	20.0	3	60.0	1	20.0
Alabama		0	13	0	0.0	12	92.3	1	7.7
Arkansas		0	9	0	0.0	5	55.6	4	44.4
District of Columbia		0	3	0	0.0	3	100.0	0	0.0
<b>Total</b>		<b>3567</b>	<b>3567</b>	<b>1180</b>	<b>33.1</b>	<b>1951</b>	<b>54.7</b>	<b>436</b>	<b>12.2</b>

**Table 2. Top 20 industries with the highest tariffs on imports from Canada**

This table lists the 20 industries that faced the highest tariffs cut.

U.S. SIC 87 (four-digit)	Industry name	U.S. Tariffs on Canadian imports (1986-1988 average)
3021	Rubber and Plastics Footwear	36.06%
2326	Men's and Boys' Work Clothing	28.88%
3253	Ceramic Wall and Floor Tile	20.00%
2111	Cigarettes	19.33%
2221	Broadwoven Fabric Mills, Manmade Fiber and Silk	14.53%
2037	Frozen Fruits, Fruit Juices, and Vegetables	11.85%
2821	Plastics Materials, Synthetic Resins, and Nonvulcanizable Elastomers	11.26%
3671	Electron Tubes	11.06%
2022	Natural, Processed, and Imitation Cheese	10.46%
3144	Women's Footwear, Except Athletic	10.01%
3171	Women's Handbags and Purses	9.73%
3229	Pressed and Blown Glass and Glassware, Not Elsewhere Classified	9.31%
2824	Manmade Organic Fibers, Except Cellulosic	8.83%
2211	Broadwoven Fabric Mills, Cotton	8.81%
3143	Men's Footwear, Except Athletic	8.55%
3824	Totalizing Fluid Meters and Counting Devices	8.06%
2084	Wines, Brandy, and Brandy Spirits	7.83%
2015	Poultry Slaughtering and Processing	7.77%
3661	Telephone and Telegraph Apparatus	7.76%
3851	Ophthalmic Goods	7.55%

### Table 3. Summary statistics

This table shows summary statistics for firm and industry characteristics. In Panel A, we report mean, median and standard deviation for the average U.S. tariffs on imports from Canada for the period 1986 to 1988. We also report the HHI index computed in 1988. In Panel B, we report summary statistics for firm variables. See Table A1 for the construction of each variable.

<i>Panel A. Competition and concentration measures</i>				
	Mean	Median	Standard deviation	
Average U.S. tariffs on imports from Canada (1986-1988)	0.0445	0.0333	0.0504	
Herfindahl-Hirschman Index (1988)	0.1737	0.1482	0.1210	

<i>Panel B. Firm characteristics</i>				
	Number of firms	Mean	Median	Standard deviation
Assets size	34264	3.6303	3.4917	2.3506
Ln age	34279	2.1884	2.1972	0.9611
ROA	33462	0.0584	0.1181	0.2421
Leverage	33410	0.1937	0.1534	0.1874
Market to book	27770	1.6435	0.6649	2.4251
Net change in capital	28581	0.1261	0.0038	0.2579
Net change in equity	29032	0.0838	0.0001	0.2305
Net change in debt	30191	0.0576	0	0.1527
Security issuance (all)	34279	0.0579	0	0.2034
Security issuance (equity)	34279	0.0457	0	0.1889
Security issuance (debt and other)	34279	0.0121	0	0.0781
Inst. investor ownership	14428	0.2686	0.2207	0.2189



**Table 4. Profitability: Effect of the FTA in states with and without BC laws**

This table reports OLS regressions. In Columns (1) - (3), we report estimates obtained for the subsample of the firms incorporated in states that passed a BC law. In Columns (4) - (6), we report estimates obtained for the subsample of the firms incorporated in states that never passed a BC law. As explanatory variables we include the treatment measuring the cut in import tariffs, as well as the treatment measuring the cut in export tariffs. Control variables are described in Table A1. Standard errors are clustered by state of incorporation and are reported in parentheses. \*, \*\* and \*\*\* denote significance at 10%, 5% and 1% respectively.

Dependent variable: ROA						
	States passing BC laws			States never passing BC laws		
	(1)	(2)	(3)	(4)	(5)	(6)
Tariffs cut (Imports)	-0.2794*	-0.3267**	-0.2740*	-0.0059	-0.0511	0.0640
	(0.1506)	(0.1427)	(0.1402)	(0.3810)	(0.2723)	(0.2451)
Tariffs cut (Exports)	0.0088	-0.0048	-0.0024	0.1033	0.0410	-0.0069
	(0.0286)	(0.0344)	(0.0283)	(0.1285)	(0.1191)	(0.0970)
Size		0.0999***	0.1015***		0.1420***	0.1318***
		(0.0123)	(0.0131)		(0.0186)	(0.0175)
Size squared		-0.0073***	-0.0074***		-0.0156***	-0.0137***
		(0.0010)	(0.0011)		(0.0024)	(0.0023)
Ln age		-0.0375***	-0.0302***		-0.0280*	0.0339
		(0.0058)	(0.0072)		(0.0168)	(0.0289)
State-year		0.2099***	0.2159***		0.1507	0.1569
		(0.0656)	(0.0669)		(0.0929)	(0.0959)
HHI <sub><i>t-1</i></sub>			0.0759*			0.0830
			(0.0407)			(0.0948)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	24937	24932	22500	3433	3433	3046
adj. R-sq	0.625	0.648	0.643	0.533	0.586	0.574

**Table 5. Profitability: Main specification**

This table reports OLS regressions. In Column (1), we include the BC law dummy and the variable measuring the change in import tariffs. In Column (2), we include the interaction between BC law dummy and the variable measuring the change in import tariffs. In Column (3), we include the BC law dummy, the import tariffs and their interaction. In Column (4), we further include a variable measuring the change in export tariffs and its interaction with the BC law dummy. Control variables are described in Table A1. Standard errors are clustered by state of incorporation and are reported in parentheses. \*, \*\* and \*\*\* denote significance at 10%, 5% and 1% respectively.

Dependent variable: ROA				
	(1)	(2)	(3)	(4)
BC	-0.0250** (0.0097)		-0.0189* (0.0101)	-0.0132* (0.0066)
BC*Tariffs cut (Imports)		-0.4255*** (0.1332)	-0.4615** (0.2168)	-0.5610** (0.2614)
Tariffs cut (Imports)	-0.2311** (0.0960)		0.1315 (0.2078)	0.2146 (0.2465)
BC*Tariffs cut (Exports)				0.0009 (0.0005)
Tariffs cut (Exports)				-0.0052 (0.0559)
Size	0.1094*** (0.0055)	0.1090*** (0.0057)	0.1093*** (0.0056)	0.1080*** (0.0065)
Size squared	-0.0085*** (0.0005)	-0.0086*** (0.0005)	-0.0085*** (0.0005)	-0.0081*** (0.0005)
Ln age	-0.0205** (0.0101)	-0.0190* (0.0110)	-0.0210** (0.0099)	-0.0208** (0.0093)
State-year	0.2220*** (0.0623)	0.2248*** (0.0636)	0.2205*** (0.0613)	0.2059*** (0.0560)
Industry-year	0.1593*** (0.0283)	0.1596*** (0.0284)	0.1587*** (0.0281)	0.1270*** (0.0275)
HHI <sub><i>t-1</i></sub>	0.0840*** (0.0272)	0.0843*** (0.0263)	0.0848*** (0.0266)	0.0735*** (0.0263)
Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Number of obs.	29512	29512	29512	25001
adj. R-sq	0.617	0.617	0.617	0.635

**Table 6, Panel A. Profitability: Robustness to industry characteristics**

This table reports OLS regressions in which we add industry controls to the baseline regression reported in Table 5, Column (3). In Column (1), we add the interaction between BC law dummy and the average tariffs before 1989. In Column (2), we add the interaction BC law dummy and HHI. In Column (3), we add as industry controls skill intensity, capital intensity and TFP growth, averaged for the period 1986 to 1989 and interacted with a post-FTA dummy. In Column (4), we include all the controls separately included in Columns (1)-(3). Control variables are described in Table A1. Standard errors are clustered by state of incorporation and are reported in parentheses. \*, \*\* and \*\*\* denote significance at 10%, 5% and 1% respectively.

Dependent variable: ROA				
	(1)	(2)	(3)	(4)
BC	-0.0183 (0.0128)	-0.0171 (0.0108)	-0.0145** (0.0065)	-0.0107 (0.0096)
BC*Tariffs cut (Imports)	-0.4476* (0.2233)	-0.4600** (0.2171)	-0.4963** (0.2057)	-0.4236** (0.1852)
Tariffs cut (Imports)	0.1377 (0.2289)	0.1346 (0.2074)	0.2646 (0.1949)	0.3052 (0.2104)
Size	0.1093*** (0.0056)	0.1093*** (0.0055)	0.1082*** (0.0069)	0.1083*** (0.0069)
Size squared	-0.0085*** (0.0005)	-0.0085*** (0.0005)	-0.0083*** (0.0006)	-0.0083*** (0.0006)
Ln age	-0.0210** (0.0098)	-0.0211** (0.0100)	-0.0226** (0.0095)	-0.0225** (0.0095)
State-year	0.2205*** (0.0613)	0.2207*** (0.0612)	0.1998*** (0.0579)	0.1997*** (0.0580)
Industry-year	0.1587*** (0.0279)	0.1592*** (0.0278)	0.1340*** (0.0245)	0.1342*** (0.0245)
HHI <sub>t-1</sub>	0.0847*** (0.0265)	0.0903*** (0.0336)	0.0832*** (0.0269)	0.0815** (0.0308)
BC*Import: Tariffs	-0.0260 (0.1855)			-0.1447 (0.1104)
BC*HHI <sub>t-1</sub>		-0.0098 (0.0229)		0.0013 (0.0229)
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry characteristics	No	No	Yes	Yes
Number of obs.	29512	29512	26018	26018
adj. R-sq	0.617	0.617	0.636	0.636

**Table 6, Panel B. Further robustness checks**

This table reports OLS regressions. In Column (1), we conduct a falsification test which considers a placebo implementation of the BC laws three years before their real implementation. In Column (2), we conduct a falsification test which considers a placebo implementation of the FTA in 1986 (three years before its real implementation), and clustering standard errors by four-digit SIC industry. In Column (3), we provide the results of estimation in Table 3, Column (5), without using any time-varying control. In Column (4), we exclude firms incorporated in Delaware. In Column (5), we exclude firms operating in more than one segment. In Column (6), we exclude the firms for which BC laws passed after the FTA implementation (i.e. BC laws passed in 1990 and 1991). In Columns (7) and (8), we replicate estimations in Table 5, Column (3) by adopting, respectively, a clustering by four-SIC industry, and incorporation states times four-digit SIC industry. Controls included are described in Table A1. Standard errors (which are clustered by state of incorporation when not differently specified) are reported in parentheses. \*, \*\* and \*\*\* denote significance at 10%, 5% and 1% respectively.

Dependent variable: ROA								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Placebo BC	-0.0078 (0.0091)							
Placebo Tariffs cut (Imports)		-0.0836 (0.1522)						
BC			-0.0074 (0.0083)	-0.0130 (0.0089)	-0.0221 (0.0135)	-0.0210* (0.0111)	-0.0189** (0.0077)	-0.0189** (0.0092)
BC*Tariffs cut (Imports)			-0.5255** (0.2528)	-0.5796** (0.2214)	-0.4652* (0.2441)	-0.5003** (0.2400)	-0.4615** (0.2082)	-0.4615* (0.2400)
Tariffs cut (Imports)			0.2577 (0.2366)	0.1390 (0.2246)	0.0693 (0.2733)	0.1462 (0.2266)	0.1315 (0.2253)	0.1315 (0.2404)
Controls	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	29512	29512	33462	14619	15983	27775	29512	29512
adj. R-sq	0.617	0.617	0.592	0.583	0.603	0.619	0.617	0.617

**Table 7, Panel A. Variations depending on firm characteristics**

This table reports OLS regressions. In Columns (1) and (2), we distinguish between exporters and non-exporters. A firm is classified as exporter if has a pre-FTA average fraction of exports to sales of at least 1%. We further add as explanatory variable the interaction between BC law dummy and the tariffs change on exports. The usual set of controls (included in all regressions but unreported to save space) is described in Table A1. Standard errors, clustered by state of incorporation, are reported in parentheses. \*, \*\* and \*\*\* denote significance at 10%, 5% and 1% respectively.

Dependent variable: ROA		
	Non-exporters	Exporters
	(1)	(2)
BC	-0.0173* (0.0096)	0.0011 (0.0056)
BC*Tariffs cut (Imports)	-0.5624* (0.3249)	-0.0622 (0.1721)
BC*Tariffs cut (Exports)	0.0419 (0.0587)	-0.2653** (0.1176)
Tariffs cut (Imports)	0.0508 (0.2818)	-0.1917 (0.1403)
Tariffs cut (Exports)	-0.0242 (0.0554)	0.3184*** (0.1140)
Controls	Yes	Yes
Firm fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Number of obs.	12542	9119
adj. R-sq	0.570	0.461

**Table 7, Panel B. Variations depending on firm characteristics**

This table reports OLS regressions. In Columns (1) and (2), we estimate separate regressions for firms that were smaller (larger) than the median industry size in 1984, one year prior to the first BC laws. In Columns (3) and (4), we estimate separate regressions for firms that were young (older) than the median firm in 1984. In Columns (5) and (6), we estimate separate regressions for firms with above (below) the median TFP of the three-digit industry where the firm operates in 1984. In Columns (7) and (8), we estimate separate regressions for firms with headquarters located in the states that have their principal cities closer (farther) than 300 miles to the road crossing of U.S.-Canada border. The usual set of controls (included in all regressions but unreported to save space) is described in Table A1. Standard errors, clustered by state of incorporation, are reported in parentheses. \*, \*\* and \*\*\* denote significance at 10%, 5% and 1% respectively.

Dependent variable: ROA								
	Large firms	Small firms	Old firms	Young firms	High-TFP firms	Low-TFP firms	Closer to border	Farther from border
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BC	-0.0006 (0.0077)	-0.0219* (0.0129)	-0.0021 (0.0069)	-0.0238* (0.0130)	0.0072 (0.0093)	-0.0235** (0.0109)	-0.003 (0.007)	-0.0402** (0.016)
BC*Tariffs cut (Imports)	-0.3875** (0.1735)	-0.8818** (0.4357)	-0.0080 (0.4047)	-0.9515*** (0.2297)	-0.4365** (0.1831)	-1.0098** (0.3895)	-0.4752** (0.187)	-0.1705 (0.246)
Tariffs cut (Imports)	0.2852* (0.1649)	0.4034 (0.4185)	0.0627 (0.3986)	0.4212 (0.2597)	0.2602* (0.1463)	0.6057 (0.4222)	0.0743 (0.17)	-0.1807 (0.283)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	12068	10445	11789	10724	11573	9753	16880	15897
adj. R-sq	0.440	0.497	0.412	0.490	0.448	0.477	0.6406	0.6026

**Table 8. Market value**

This table reports OLS regressions. Market-to-book ratio is estimated as the market value of equity at the end of the fiscal year over the book value of common equity. The ratio is limited to be between 0 and 10. Control variables are described in Table A1. Standard errors, clustered by state of incorporation, are reported in parentheses. \*, \*\* and \*\*\* denote significance at 10%, 5% and 1% respectively.

Dependent variable: Market to book ratio					
	(1)	(2)	(3)	(4)	(5)
BC	0.0600 (0.0704)	0.0792 (0.0736)	0.0634 (0.0749)	0.0595 (0.0701)	0.0803 (0.0784)
BC*Tariffs cut (Imports)	-9.3694** (4.3318)	-8.1342* (4.0729)	-9.6753** (4.1935)	-9.2261** (4.3689)	-8.2717** (3.9765)
Tariffs cut (Imports)	6.1295 (3.9027)	5.4033 (3.6081)	6.1128 (3.7178)	6.1097 (3.9701)	5.3669 (3.4925)
BC*Tariffs cut (Exports)	1.6912 (1.5045)	1.4100 (1.4180)	1.9807 (1.4368)	1.6962 (1.4972)	1.5933 (1.3860)
Tariffs cut (Exports)	-1.0025 (1.5086)	-0.7388 (1.4247)	-1.1933 (1.4295)	-1.0407 (1.4969)	-0.8532 (1.3808)
Size	0.4756*** (0.1015)	0.3934*** (0.0899)	0.4790*** (0.1105)	0.4975*** (0.1128)	0.4271*** (0.1148)
Size squared	-0.0038 (0.0073)	0.0024 (0.0063)	-0.0031 (0.0078)	-0.0052 (0.0085)	0.0009 (0.0086)
Ln age	-0.2217*** (0.0752)	-0.1977*** (0.0697)	-0.1942** (0.0803)	-0.2602*** (0.0672)	-0.2091*** (0.0652)
State-year	0.1756*** (0.0571)	0.1797*** (0.0589)	0.1649*** (0.0546)	0.1660*** (0.0541)	0.1581*** (0.0537)
Industry-year	0.3056*** (0.0306)	0.3105*** (0.0285)	0.3095*** (0.0292)	0.3062*** (0.0316)	0.3140*** (0.0283)
HHI <sub><i>t-1</i></sub>	0.9180*** (0.3045)	0.8930*** (0.3139)	0.8836*** (0.2832)	0.9243*** (0.3058)	0.8484*** (0.2918)
ROA <sub><i>t-1</i></sub>		0.4612*** (0.1273)		0.3862** (0.1450)	
Leverage <sub><i>t-1</i></sub>			-0.5752*** (0.1211)	-0.5498*** (0.0977)	
R&D/Sales <sub><i>t-1</i></sub>				0.0017*** (0.0001)	0.0018*** (0.0001)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Number of obs.	22091	21714	21747	21818	21188
adj. R-sq	0.520	0.524	0.523	0.518	0.521

**Table 9. Abnormal returns around Canadian general election in 1988**

This table reports the cumulative abnormal returns of stocks of U.S. firms. Cumulative abnormal returns are calculated as the difference between actual holding returns, as extracted from CRSP, and expected returns, projected using a market model with the parameters estimated from 241 to 41 trading days prior to November 19, 1988. Event date [0] corresponds to November 19, 1988. Columns (1)-(3) report results for different equally weighted portfolios, constructed at a three-digit SIC industry level. Column (1) reports results where all firms in the industry are combined in the same portfolio, Column (2) reports the average abnormal returns for the portfolios of the firms that were in the industry with high (larger than 0.033) tariff while column (3) reports the average abnormal returns for the portfolios of the firms that were in the industry with low (lower than 0.033) tariff. Columns (5)-(6) report results for different equally weighted portfolios, constructed at the state of incorporation level. Column (5) reports the average abnormal returns for the portfolios of the firms that were incorporated in the states that passed BC law before 1989 while column (6) reports the average abnormal returns for the portfolios of the firms that were incorporated in the state that passed BC law on or after 1989. Standard errors are reported in parentheses. \*, \*\* and \*\*\* denote significance at 10%, 5% and 1% respectively.

CARs around Canadian election results							
	All firms	High tariffs	Low tariffs	Difference (2)-(3)	BC laws present	No BC laws	Difference (5)-(6)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<b>[-20,-1]</b>	-0.0035 (0.0064)	-0.0138 (0.0087)	0.0075 (0.0093)	-0.0212* (0.0127)	-0.0013 (0.0168)	0.0186 (0.0227)	-0.0199 (0.0332)
<b>[-5,-1]</b>	-0.0024 (0.0034)	-0.0063 (0.0041)	0.0018 (0.0055)	-0.0081 (0.0068)	0.0013 (0.0042)	-0.0069 (0.0087)	0.0081 (0.0122)
<b>[-1,0]</b>	-0.0003 (0.0039)	-0.0045 (0.0030)	-0.0021 (0.0040)	-0.0024 (0.0049)	-0.0050 (0.0037)	-0.0037 (0.0045)	-0.0012 (0.0067)
<b>[0,0]</b>	-0.0009 (0.0034)	-0.0043** (0.0018)	-0.0030 (0.0029)	-0.0013 (0.0034)	-0.0057** (0.0026)	-0.0034 (0.0036)	-0.0023 (0.0052)
<b>[0,1]</b>	-0.0016 (0.0037)	-0.0086*** (0.0023)	-0.0003 (0.0036)	-0.0083* (0.0043)	-0.0064* (0.0038)	0.0043 (0.0058)	-0.0106 (0.0083)
<b>[0,3]</b>	-0.0049* (0.0028)	-0.0091*** (0.0032)	-0.0003 (0.0047)	-0.0088 (0.0057)	-0.0135*** (0.0047)	0.0020 (0.0060)	-0.0155* (0.0088)
<b>[0,5]</b>	-0.0034 (0.0032)	-0.0125*** (0.0042)	0.0063 (0.0046)	-0.0188*** (0.0062)	-0.0144*** (0.0052)	0.0044 (0.0069)	-0.0188* (0.0101)



**Table 10. External finance**

This table reports OLS regressions. In Columns (1) to (3), we use net change in capital as dependent variable. In Column (1), we consider the combined net change in equity and debt, normalized by the firm's book value of assets at the beginning of the year. In Column (2), only net change in common shares of equity is considered, while in Column (3) only net change in debt is considered. In Columns (4)-(6), we instead use Security issuance as the dependent variable. Security issuance is estimated from the data in SDC New Issues database and equal to total proceeds from issuance of securities over the year as a fraction of book value of assets at the beginning of the year. Any type of securities is considered in Column (4), only equity issuances in Column (5) and all other issuances (mainly debt) in Column (6). All dependent variables are constrained to lie between 0 and 1. Control variables are described in Table A1. Standard errors, clustered by state of incorporation, are reported in parenthesis. \*, \*\* and \*\*\* denote significance at 10%, 5% and 1% respectively.

Dependent variable:	Net change in capital	Net change in equity	Net change in debt	Security issuance [all]	Security issuance [equity]	Security issuance [debt and other]
	(1)	(2)	(3)	(4)	(5)	(6)
BC	-0.0308** (0.013)	-0.0194** (0.009)	-0.0154** (0.007)	-0.0049 (0.009)	-0.0039 (0.008)	-0.0012 (0.003)
BC*Tariffs cut (Imports)	-0.4886*** (0.174)	-0.2906** (0.123)	-0.2514 (0.189)	-0.4371** (0.172)	-0.3246* (0.167)	-0.1108* (0.065)
Tariffs cut (Imports)	-0.1071 (0.203)	-0.1180 (0.140)	0.0546 (0.200)	0.2368* (0.120)	0.2042* (0.114)	0.0248 (0.053)
Size	0.0551*** (0.010)	0.0456*** (0.009)	0.0218*** (0.004)	-0.0327*** (0.008)	-0.0360*** (0.009)	0.0033*** (0.001)
Size squared	0.0002 (0.001)	-0.0027*** (0.001)	0.0016*** (0.000)	-0.0032*** (0.001)	-0.0022** (0.001)	-0.0010*** (0.000)
Ln age	-0.2914*** (0.012)	-0.2857*** (0.012)	-0.0483*** (0.005)	-0.1368*** (0.007)	-0.1314*** (0.007)	-0.0054*** (0.001)
Leverage	0.2239*** (0.012)	-0.1734*** (0.015)	0.4148*** (0.011)	0.0538*** (0.009)	0.0888*** (0.013)	-0.0350*** (0.006)
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry and state trends	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	20493	20571	21862	23810	23810	23810
adj. R-sq	0.3610	0.4107	0.2125	0.3152	0.3442	0.0899

**Table 11. The role of industry financial constraints**

This table reports OLS regressions. In Columns (1) and (2), we estimate separate regressions for firms that were in the industries with high (low) net change in capital in 1984, one year prior to the first BC laws. Net change in capital is estimated as net change in equity and debt, normalized by the firm's book value of assets at the beginning of the year. In Columns (3) and (4), we estimate separate regressions for firms that were in the industries with high (low) net security issuance in 1984, one year prior to the first BC laws. Security issuance is estimated from the data in SDC New Issues database and equal to total proceeds from issuance of securities over the year as a fraction of book value of assets at the beginning of the year. The usual set of controls (included in all regressions but unreported to save space) is described in Table A1. Standard errors, clustered by state of incorporation, are reported in parentheses. \*, \*\* and \*\*\* denote significance at 10%, 5% and 1% respectively.

Dependent variable: ROA				
	High net change in capital <i>[based on balance sheet changes]</i>	Low net change in capital	High net change in capital <i>[based on new security issuances]</i>	Low net change in capital
	(1)	(2)	(3)	(4)
BC	-0.0227 (0.016)	-0.0035 (0.007)	-0.0081 (0.009)	-0.018 (0.015)
BC*Tariffs cut (Imports)	-1.0507*** (0.219)	-0.0429 (0.353)	-0.9238*** (0.238)	-0.2712 (0.376)
Tariffs cut (Imports)	0.3441 (0.236)	0.0295 (0.347)	0.4372** (0.203)	-0.049 (0.419)
Controls	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Number of obs.	12838	11202	11847	12193
adj. R-sq	0.4892	0.4592	0.4938	0.4924

**Table 12. External finance and product prices**

This table reports OLS regressions controlling for year, industry fixed effects and the HHI from the U.S. Census, which is computed by replacing the missing years with the last available year. In Columns (1) and (2), we estimate separate regressions for industries that had high amount of new capital raised between 1989 and 1995 (that is, the post-FTA period) and low amount of new capital raised between 1989 and 1995. We estimate this measure of new capital raised by summing all new capital raised for all firms (both public and private) in each industry as reported by SDC New Issues database and normalizing it by the value of total shipments in the industry in 1989. In Columns (3)-(6), we report the same regressions in Columns (1) and (2) by splitting the sample for the industries above/below the median HHI. Heteroskedasticity-adjusted robust standard errors are reported in parentheses. \*, \*\* and \*\*\* denote significance at 10%, 5% and 1% respectively.

Dependent variable: Producer Price Index						
	High capital raised	Low capital raised	High capital raised <i>[concentrated industries]</i>	High capital raised <i>[competitive industries]</i>	Low capital raised <i>[concentrated industries]</i>	Low capital raised <i>[competitive industries]</i>
	(1)	(2)	(3)	(4)	(5)	(6)
Tariffs cut (Imports)	-4.7801 (10.6020)	-15.7907** (7.1395)	-3.8118 (7.7048)	-36.8922 (35.9072)	-2.3315 (8.8081)	-58.6253*** (10.3587)
Controls (HHI)	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of obs.	1777	1671	1231	546	869	802
adj. R-sq	0.813	0.777	0.784	0.878	0.753	0.875

## Appendix. List of variables

Name of the Variable	Description (or estimation for variables extracted from Compustat, using Compustat's definitions of data sources)	Source
<i>Governance Characteristics</i>		
BC (or BC law present)	Dummy variable equal to one starting from the year after the passage of the BC law by the state where the firm is incorporated, and zero otherwise, where the list of times of passage is provided in Table 1	
<i>Competition Variables</i>		
Import: Tariffs <sub>89</sub>	Change in the tariffs on imports of Canadian goods around 1989. The before-1989 tariffs are computed as average for period 1986-1988 (following Guadalupe and Wulf 2010) for each four-digit SIC industry. After 1989 on, we assume that all tariffs went to zero. To estimate average pre-1989 tariffs, we divide the total duties paid by the total customs value of imports, paid across all sub-industries of each four-digit SIC industry in each year between 1986 and 1988	Center for Int. Data at UC Davis
Average Tariffs <sub>89</sub>	Average tariffs on imports of Canadian goods for the period 1986-1988 for each four-digit SIC industry. To estimate average tariffs we divide the total duties paid by the total customs value of imports, paid across all sub-industries of each four-digit SIC industry in each year between 1986 and 1988	Center for Int. Data at UC Davis
Export: Average Tariffs <sub>89</sub>	Average tariffs on exports to Canada for the period 1986-1988 for each four-digit SIC industry	Trefler (2004)
High (low) tariff	Dummy equal to one if Tariffs <sub>89</sub> is larger (smaller) than 0.033, zero otherwise	Center for Int. Data at UC Davis
HHI	Herfindahl-Hirschman Index, computed as the sum of squared market shares of all firms, based on sales, in a given three-digit SIC industry in each year	Compustat (or Census)
PPI	Annual average (M13) of the Producer Price Index for each four-digit SIC industry	Bureau of Labor Statistics
<i>Firm Characteristics</i>		
Ln age	$=\ln(\text{age}+1)$ , where age is the number of years that the firm has been in Compustat	Compustat
Asset size	$=\ln(\text{at})$ , where at is the size of assets, in millions	Compustat
ROA	$=\text{ebitda}/\text{at}_{t-1}$ , where ebitda is the earnings before interest, taxes, depreciation and amortization and at is the size of assets	Compustat
Leverage	$=(\text{dlc}+\text{dltt})/\text{at}$ , where dlc is the size of financial debt due in one year, dltt is the size of long-term financial debt at is the size of assets	Compustat
Market-to-book	$=(\text{prcc}_f * \text{cshtr}_f) / \text{ceq}$ , where prcc_f is the market price of common share at the end of the fiscal year, cshtr_f is the number of common shares outstanding and ceq is the book value of equity. The variable is trimmed between 0 and 10	Compustat
R&D/Sales	$=\text{xrd}/\text{sale}$ where xrd is the size of R&D expenditures and sale is the annual sales	Compustat

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Net change in capital	$=((dd1_t+dltt_t)-(dd1_{t-1}+dltt_{t-1})+(sstk-prstkc))/at_{t-1}$ , where $dlc$ is the size of financial debt due in one year, $dltt$ is the size of long-term financial debt, $sstk$ is the sale of common and preferred stock, $prstkc$ is the purchase of common and preferred stock and $at$ is the size of assets. The variable is trimmed between zero and ten	Compustat
Net change in equity	$=((sstk-prstkc))/at_{t-1}$ , where $sstk$ is the sale of common and preferred stock, $prstkc$ is the purchase of common and preferred stock and $at$ is the size of assets. The variable is trimmed between zero and ten	Compustat
Net change in debt	$=((dd1_t+dltt_t)-(dd1_{t-1}+dltt_{t-1}))/at_{t-1}$ , where $dlc$ is the size of financial debt due in one year, $dltt$ is the size of long-term financial debt, and $at$ is the size of assets.. The variable is trimmed between zero and ten	Compustat
Security issuance	Total proceeds from issuance of securities over the year as a fraction of book value of assets at the beginning of the year, trimmed between zero and one	SDC, Compustat
Large (small) firm	Dummy variable equal to one if asset size of the firm were larger (smaller) than the median size of the firms in the firm's three-digit SIC industry in 1984, zero otherwise	Compustat
Young (old) firm	Dummy variable equal to one if the age of the firm were larger (smaller) than the median size of the firms in the firm's three-digit SIC industry in 1984, zero otherwise	Compustat
Closer to (farther from) the border	Dummy variable equal to one if the distance of the principal city of the state where firm's headquarters are located is closer (farther) than 300 miles to the road crossing of U.S.-Canada border	Various
Exporters (non exporters)	Dummy variable equal to one if the firm reports an average of at least (less than) 1% of export to sales for the pre-FTA period	Compustat
<i>State (Industry) Trends</i>		
State-year	Average of the dependent variable across all firms in the same state of location of the firm, where averages are computed excluding the firm in question	Compustat
Industry-year	Average of the dependent variable across all firms in the same four-digit SIC industry of the firm, where averages are computed excluding the firm in question	Compustat