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The Effect of Trade Liberalization on Firm-Level Profits: An Event-Study Approach

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Abstract
I use an event study approach to present novel evidence on the impact of trade liberalization on firm-level profits. Using the uncertainty surrounding the negotiation and ratification process of the Canada-United States Free Trade Agreement of 1989 (CUSFTA), I estimate the impact of different types of tariff reductions on the abnormal returns of Canadian manufacturing firms. I find that Canadian import tariff reductions lead to lower, and reductions in Canadian intermediate input tariffs to higher abnormal returns. The impact of U.S. tariff reductions is less clear and depends on the size of the affected firms. I also calculate the total profit increase implied by my estimates. Overall, CUSFTA increased per-period profits by around 1.2%. This was mainly driven by intermediate input tariff reductions which more than offset the negative effect of Canadian import tariff reductions.

Keywords: Profitability, Trade Liberalization, Stock Market Event Studies, Canada-U.S. Free Trade Agreement
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1 Introduction

Over the past three decades, countries and trading blocks around the world have undertaken substantial efforts to reduce barriers to trade. These efforts have taken the form of unilateral liberalization initiatives, multilateral negotiations in the WTO, and more recently, bilateral and regional liberalization attempts through preferential trade agreements (PTAs). In parallel to these developments, a large empirical literature has examined the consequences of trade liberalization for various aspects of economic activity. For example, studies such as Pavnick (2002), Trefler (2004), and Topalova and Khandelwal (2012) have estimated the impact of trade liberalization on sector- and firm-level productivity, firm exit and entry, employment, and wages.

One aspect of trade liberalization which has not yet received sufficient attention is its impact on firm-level profitability. This is despite the fact that profit changes are an important part of the overall welfare impact of lower trade barriers. They are also of first-order importance for the companies exposed to freer trade and are thus key to understanding political economy aspects of PTAs, such as lobbying responses by firms. Finally, changes in firm-level profitability are the central mechanism through which trade liberalization affects economic activity in theoretical models of international trade. A better grasp of how freer trade affects profitability should thus also help with the theoretical analysis of trade liberalization episodes.

In this paper, I use stock market reactions to measure the impact of trade liberalization on profits. I do so by looking at changes in share prices following unanticipated changes in the likelihood of the implementation of the Canada-U.S. Free Trade Agreement of 1989 (CUSFTA). Under the assumption that such changes are sufficiently quickly reflected in stock prices, price reactions can be used to infer the profit impact of trade liberalization.

CUSFTA is particularly well-suited to study stock price reactions to trade liberalization initiatives. As has been discussed by authors such as Trefler (2004), it was a 'pure' trade liberalization in the sense that it was not accompanied by any other important economic reform, nor did it take place in response to a macroeconomic shock. The main instrument of liberalization were tariff reductions which are easily quantifiable and as such amenable to an econometric analysis. Since CUSFTA what a reciprocal agreement, it brought about tariff cuts by both the United States and Canada, allowing to disentangle the effects of increased import competition and better exporting opportunities on firm-level profits. Finally, there were a number of unexpected events during CUSFTA's negotiation and ratification process which allow for the implementation of an event study approach.

My analysis proceeds as follows. I first show theoretically how to infer event-induced changes in future profits from abnormal stock returns on the event date. My initial focus is only on the direction of effects, that is, whether a given event increased or decreased future profits. As I discuss in more detail below, this requires only relatively mild assumptions, such as a weak form of market efficiency.

For each of my event dates, I compute abnormal returns and correlate them with planned reductions in trade barriers (which were already know at the time). Throughout, I focus on stock price reactions in Canada where CUSFTA was a much more important liberalization event than in the United States. I regress abnormal returns of Canadian manufacturing firms on sector-

specific Canadian import tariffs, U.S. import tariffs and reductions in Canadian intermediate input tariffs. I find that for events which increased the likelihood of CUSFTA's implementation, firms in sectors with higher future Canadian tariff cuts experienced significantly more negative abnormal returns (and thus lower future profits) than firms in sectors with lower future tariff cuts. In contrast, larger reductions in intermediate input tariffs led to higher abnormal returns. I do not find a clear-cut pattern for U.S. tariff reductions. Interestingly, however, this last result seems to be due to firm heterogeneity: while larger firms benefited from U.S. tariff reductions, smaller firms experienced more negative abnormal returns in sectors with higher tariff cuts. These two opposing effects tend to cancel each other, leading to inconclusive results in the aggregate regressions.

In a second step, I use the dividend discount model to compute the magnitude of the profit changes implied by the abnormal returns estimated in the first step. This requires a number of additional assumption such as a stronger form of market efficiency and estimates of the changes in the implementation probability of CUSFTA induced by an event. For my preferred set of assumptions, my abnormal return results imply that CUSFTA increased total yearly profits of Canadian manufacturing firms by approximately 1.2%. This was mainly driven by intermediate input tariff reductions which more than offset the negative effect of Canadian import tariff reductions.

My paper is related to two strands in the literature. To the best of my knowledge, the only existing studies looking explicitly at the profit impact of trade liberalization are Hay (2001) and Baggs and Brander (2006). Both estimate the effect of liberalization on firm-level accounting profits and find strong effects of tariff reductions on profits. The present study is complementary to these papers. While using an event study approach requires additional assumptions (such as a form of market efficiency), it avoids relying on accounting profits which have been criticized in the industrial organization literature for their sometimes weak link to economic profitability (see Schmalensee, 1989). Secondly, stock returns capture changes in the expected lifetime profits of a firm, rather than just changes over a pre-defined time horizon. They are also are available immediately after the signing or implementation of an FTA which makes them particularly useful for forecasting future effects on domestic firms. Finally, the reliance on ex-post profitability data makes it difficult to disentangle the impact of trade liberalization from the myriad of other factors which also influence firm profitability over the time horizon in question (usually several years). In contrast, I will be working with very short event windows of usually one or two days, which substantially reduces the number of omitted variables potentially correlated with the trade policy measures I look at.

The present paper is also related to a small number of studies which look at stock price reactions to trade policy events. Hartigan, Kamma and Perry (1986, 1989), Hughes, Lenway and Rayburn (1997), Bloningen, Tomlin and Wilson (2004), and Crowley and Song (2014) look at stock price reactions to sector-specific anti-dumping duties. Brander (1991), Thompson (1993, 1994), and Breinlich (2014) also look at trade-liberalization-induced stock price reactions but are primarily interested in using the resulting return patterns to test theories of international trade, or hypotheses about the likely impact of trade liberalization on stock prices.[1] Moser and

[1] Grossman and Levinsohn (1989) use stock price reactions to test the specific factors model of international

Rose (2014) estimate the impact of regional trade agreements on aggregate stock market indices but do not compute price reactions and implied profit changes at firm level. While they are able to look at a wide range of PTAs and examine differences in the impact of these PTAs, they lack the level of detail which is available when focusing on an individual trade liberalization episode. This includes the ability to carefully select the relevant events and, in particular, to disentangle the impact of specific trade policy measures (import, export, and intermediate input tariffs) on the stock prices of individual firms. Finally, none of the above studies explicitly calculates implied absolute profit changes of individual firms and decomposes aggregate (manufacturing sector) profit changes into parts due to different types of tariff reductions.

The rest of this paper is structured as follows. Section 2 provides more details about CUSFTA, its negotiation and ratification process, and the specific events I will study. Section 3.1 describes the methodology and Section 3.2 the data sources used. Sections 4.1 and 4.2 present results for my abnormal returns regressions and carry out a number of robustness checks. Section 4.3 computes the profit changes associated with the liberalization-induced abnormal returns and Section 5 concludes.

2 Description of CUSFTA and Selected Events

The negotiation process for CUSFTA started in May 1986 and was successfully concluded in October 1987. The treaty was signed in early 1988 and ratified by the U.S. and Canadian Parliament in late 1988. The agreement came into effect on 1 January 1989 and tariffs were phased out over a period of up to ten years, with some industries opting for a faster elimination.

The specific events I will use for my event study are all related to the negotiation and ratification process in Canada. This focus is due to the much larger impact of the agreement on Canada (which liberalized trade with a country ten times its economic size) and the fact that CUSFTA was particularly contentious within Canada. Indeed, it was by far the most important issue in the Canadian general election of November 1988, with the main opposition parties opposed to its ratification and the incumbent government in favor.

The first event I look at is the successful conclusion of negotiations on 3 October 1987.[2] Because the negotiation process had been difficult, it remained uncertain until a few hours before the deadline on October 3 whether an agreement could be reached. Thus, the successful conclusion of negotiations was at least in part unexpected. At the same time, most elements of CUSFTA (including the scope and speed of the elimination of tariffs) had already been agreed upon and made public, so that market participants should have been aware of them.

The second, third and fourth event are related to CUSFTA's ratification. The negotiations and the subsequent ratification process had been initiated, and were supported by, the incumbent Conservative government under prime minister Brian Mulroney. However, the two main Canadian opposition parties, the Liberal Party and the New Democratic Party, were both opposed to the agreement. While the Conservative Party had a clear majority in the House of

trade. They do not look at individual trade liberalization episodes but use vector autoregressive techniques to isolate shocks to the prices of import goods competing with the domestic firms whose stock prices they analyse.

[2] The following is based on the coverage of the negotation process in the Canadian newspaper *The Globe and Mail* from 5 October 1987. Also see Thompson (1993).

Commons, the lower chamber of the Canadian Parliament, the Senate (or Upper House) was still controlled by the Liberal Party. On the morning of 20 July 1988, John Turner, the Liberal Party's leader, announced at a press conference that he had instructed the Liberal majority in the Senate to block the ratification of CUSFTA until a general election, which was expected to be called within the next months. This was seen by many as a move to help the electoral prospects of his party which was trailing in the opinion polls (Johnston et al., 1992). By delaying the ratification, John Turner effectively turned the general election into a referendum on CUSFTA. This move destroyed any hopes for a quick ratification and raised the possibility that CUSFTA might not be implemented, given that both the Liberal Party and the other main opposition party, the New Democrats, were opposed to the agreement.

The third event is a particularly dramatic change in opinion polls during the election campaign. After it had become clear that the Senate would not ratify CUSFTA, prime minister Brian Mulroney called a general election for November 21. His Conservative Party led in the initial phase of the election campaign with a predicted vote share of over 40%. Historically, this had been enough to guarantee an absolute parliamentary majority in Canada's first-past-the-post electoral system. An important turning point came with the only two televised debates between the main parties' leaders on October 24 and 25. Against expectations, John Turner emerged as the clear winner from these debates and the Liberal Party started catching up in the opinion polls. The most dramatic and unexpected event in this phase of the campaign was the publication of a Gallup poll on the morning of November 7, putting the Liberals at 43% of the vote, compared to only 31% for the Conservatives and 22% for the New Democrats. This presented a massive increase in support for John Turner's party and for the first time made a Liberal victory look likely.[3]

In response to the Gallup poll, the Conservatives undertook a radical overhaul of their campaign strategy, enabling them to catch up in the opinion polls again (Frizzell et al., 1989). However, it was only on the weekend before the election that it became clear that the Conservatives would win. On November 19, three nationwide polls again put the Conservatives at over 40% and clearly ahead of the Liberals. These predictions proved to be almost exactly correct, and on November 21 the Conservatives won the election with 43% of the popular vote, compared to 32% for the Liberal Party and 20% for the New Democrats.

Table 1 summarizes the selection of events. For each event, the table indicates whether the event increased or decreased the likelihood of CUSFTA's implementation, and the relevant trading day. For the first event, this was the Monday after the successful conclusion of the negotiations. For the fourth event, my event window includes both the election day (Monday, November 21) and the day after the election. While the election result was only announced after the close of markets on November 21, the publication of the three opinion polls on November 19 had already made a Conservative victory very likely.

[3] See Brander (1991) and Frizzell et al. (1989).

3 Methodology and Data Sources

3.1 Methodology

This section shows how to infer trade-liberalization-induced profit changes from the stock price reactions of Canadian firms on my event dates. I proceed in three steps. Using the dividend discount model, I first show how to decompose total stock returns into a part due to expected and a part due to unexpected profit changes. I then model the unexpected (or "abnormal") part of stock returns as a function of the future tariff reductions implemented under CUSFTA. Finally, I show how to translate the estimated abnormal returns into changes in future profits.

Stock Returns and Future Profits. I use the dividend discount model to link stock prices and future profits, as is standard in the literature (see Brealey and Myers, 2000). The dividend discount model states that the price of firm i's shares at time t equals the net present value of its future stream of dividends per share:

$$p_{i,t} = \sum_{s=1}^{\infty} \frac{E_t(D_{i,t+s})}{(1+e_i)^s} = \sum_{s=1}^{\infty} \frac{D_{i,t}\,(1+g_i)^s}{(1+e_i)^s} = \frac{D_{i,t}\,(1+g)}{e_i - g_i},$$

where g_i is the expected per-period growth rate of dividends for firm i, and e_i is the firm-specific discount factor. Assuming that all profits are disbursed as dividends, or that profits are reinvested at an internal rate of return equal to e_i, the share price of firm i is equal to the net present value of expected future profits per share (π_i):

$$p_{i,t} = \frac{\pi_{i,t}\,(1+g_i)}{e_i - g_i}$$

Forwarding this equation by one period, we obtain price p_{it+1} as:

$$p_{i,t+1} = \frac{\pi_{i,t+1}\,(1+g_i)}{e_i - g_i}$$

Note that the actual profits in period $t+1$, $\pi_{i,t+1}$, can be different from their expected value in period t, $\pi_{i,t}\,(1+g_i)$. The assumption I make in the following is that expected profit/dividend growth rates (g_i) do not change over time, but that there can be unexpected level-shifts in profits between two periods.[4] Using the above expressions for $p_{i,t+1}$ and $p_{i,t}$, I can compute the realized return on stock i between the two periods:

$$r_{it} = \frac{p_{t+1} - p_t}{p_t} = \frac{\pi_{i,t+1}\,(1+g_i)}{e_i - g_i} \Big/ \frac{\pi_{i,t}\,(1+g_i)}{e_i - g_i} - 1 = g_i + \frac{\pi_{i,t+1} - \pi_{i,t}\,(1+g_i)}{\pi_{i,t}}, \qquad (1)$$

where I have decomposed the realised return into its expected part (g_i) and a part due to an unexpected change in profits between periods t and $t+1$. The empirical counterpart of equation (1) is the following simple mean-adjusted returns regression equation (see Binder, 1998):

[4] As will become clear below, event-induced abnormal returns can only be used to infer the net present value of future profit changes, but not their exact time path. As such, it is irrelevant whether I model unexpected changes in profits as a level-shift or a change in the expected growth rates (or a combination of both). For each change in the expected growth rate, there will always be a corresponding level-shift in profits which results in the same net present value change.

$$r_{it} = \alpha_i + \varepsilon_{it} \tag{2}$$

where the stock-specific intercept (α_i) captures the "normal" part of stock i's return, and ε_{it} captures its "abnormal" part.[5]

Linking Profit Changes to Tariff Reductions. The next step is to link a stock's abnormal return on a given event date more closely to trade policy changes (i.e., to reductions in import, export and intermediate input tariffs). To this end, I model the event-induced abnormal returns of firm i, ε_{it} in (2), as a function of tariff variables and additional firm-level controls:

$$r_{it} = \alpha_i + \sum\nolimits_{w=1}^{W} d_{wt} \left(\beta_0 + \beta_{1w} X_i + \beta_{2w} d\tau_{CAN,j} + \beta_{3w} d\tau_{US,j} + \beta_{4w} d\tau_{input,j}\right) + \eta_{it}. \tag{3}$$

The regressors d_{wt} are a set of dummy variables which take on the value of one for one particular day during event window W. For example, for the election event, $W = 2$ and $d_{1t} = 1$ on November 21 and $d_{2t} = 1$ on November 22. The remaining regressors are firm-level controls (X_i) and the three types of tariff reductions, where the subscript j denotes the industry in which firm i is active. The coefficient estimates β_{1w} to β_{4w} represent the average abnormal returns on event day w associated with each regressor. My fourth event (the election) takes place over two days and I calculate cumulative average abnormal returns (CAARs) for each regressor, defined as $CAAR_{.W} = \sum_{w=1}^{W} \hat{\beta}_{.w}$. For the other three events, the event window length is only one day so that CAARs are identical to simple abnormal returns.

I use a sample with both pre-event and event data to estimate (3). This one-step approach is equivalent to the more traditional two-step procedure in which return parameters α_i are first estimated on pre-event data and used to compute abnormal returns for the event period (see Binder, 1998). The advantage of the one-step approach chosen here is that it allows for a straightforward modeling of cross-sectional dependence and heteroscedasticity in abnormal returns via the clustering of standard errors in an OLS regression framework.[6] In my robustness checks below, I also use the traditional two-step approach and show that it leads to essentially identical results.

Note that modeling ε_{it} as a function of tariff cuts has at least two advantages. First, it allows to break down the sources of the overall abnormal returns on the event date. This is useful for judging the relative importance of the three types of tariff reductions brought about by CUSFTA. Second, it ties variation in ε_{it} more closely to trade policy changes. This is important because not all of the estimated abnormal returns on a given event date will be due to changes in the implementation probability of CUSFTA. For example, while CUSFTA was

[5] Here, $\alpha_i = g_i$ is the expected growth rate of dividends and $\varepsilon_{it} = \left[\pi_{i,t+1} - \pi_{i,t}\left(1 + g_i\right)\right] / \pi_{i,t}$ is the unexpected level-shift in profits between periods t and $t+1$. The advantage of this relatively simple model of stock returns is that its connection to the dividend discount model is straightforward. Below, I also show that my results are almost identical if I use more sophisticated models of stock returns, such as the market model or the multifactor model proposed by Fama and French (1993).

[6] I cluster standard errors by trading day in all regressions reported below. This clustering structure allows for heteroscedasticity and cross-sectional dependence in the residual η_{it} for a given day. Consistent with the maintained assumption of market efficiency, it also restricts intertemporal correlations to zero.

by far the most important issue in the Canadian election campaign of 1988, a Conservative election victory might have benefited certain firms more due to factors other than the free trade agreement. However, unless these factors are systematically correlated with tariff cuts, my approach will still yield consistent estimates of the profit impact of CUSFTA.[7] Also note that only two of my four events are directly linked to the election campaign. The primary effect of my second event, the blocking of CUSFTA by the Liberal majority in the Senate, was to lower the ratification likelihood of CUSFTA; and my first event, the successful conclusion of negotiations on 3 October 1987, was completely unrelated to the later Conservative victory, making concerns about potential omitted variables much less relevant there.

Quantifying the Profit Impact of CUSFTA. Once abnormal returns linked to tariff reductions have been estimated, it is straightforward to use the structure of the dividend discount model to infer the implied firm-level profit changes. As discussed, expected profits in the next period $(t+1)$ will be the current profit, π_{it}, times the expected growth rates of profits, $1+g_i$. From (1) and (2), we have $g_i = \alpha_i$ and thus $\pi_{it}(1+g_i) = \pi_{it}(1+\alpha_i)$. Likewise, if the event causes positive abnormal returns ε_{it} in addition to the expected returns α_i, realized profits in period $t+1$ will be $\pi_{it}(1+\varepsilon_{it}+\alpha_i)$. Thus, using our estimates $\hat{\alpha}_i$ and $\hat{\varepsilon}_{it}$ from the first step, we can estimate the event-induced increase in (per-period) profits as:

$$\widehat{d\pi^E} \equiv \frac{\pi_{it}(1+\hat{\varepsilon}_{it}+\hat{\alpha}_i) - \pi_{it}(1+\hat{\alpha}_i)}{\pi_{it}(1+\hat{\alpha}_i)} = \frac{\hat{\varepsilon}_{it}}{1+\hat{\alpha}_i} \tag{4}$$

Using the modeling of $\hat{\varepsilon}_{it}$ as a function of tariff and firm-level variables in (3), we can decompose this total profit change into changes due to the three types of tariff reductions ($\hat{\beta}_{2w} dt_{CAN,j}$, $\hat{\beta}_{3w} dt_{CAN,j}$, and $\hat{\beta}_{4w} dt_{input,j}$), firm-level covariates ($\hat{\beta}_{1w} X_i$) and a residual part ($\hat{\beta}_0 + \hat{\eta}_{it}$).

Ultimately, one would like to infer not only the change in future profits brought about by the event in question but also the overall profit impact of CUSFTA. Here, the main complication is that the events discussed in Section 2 led to changes in the probability of CUSFTA's implementation, but that the ex-ante probability was larger than 0% and the ex-post probability might be smaller than 100% (e.g., an event might increase the implementation probability from 50% to 70%). This means that the implied profit changes need to be weighted by the change in the implementation probability to arrive at the total profit impact of CUSFTA.

Formally, let $\pi_{i,C}$ be the expected per-period profit of firm i with CUSFTA and $\pi_{i,NC}$ the expected profit if CUSFTA is not implemented. Furthermore, denote $\lambda_{C,t}$ the likelihood of CUSFTA's successful implementation in period t (before the event), and $\lambda_{C,t+1}$ the implementation likelihood after the event. Then,

$$d\pi^E = \frac{\lambda_{C,t+1}\pi_{i,C} + (1-\lambda_{C,t+1})\pi_{i,NC}}{\lambda_{C,t}\pi_{i,C} + (1-\lambda_{C,t})\pi_{i,NC}} - 1$$

This can be solved for the implied change in firm i's profit due to CUSFTA:

[7] Ideally, one would like to control for the likely industry-specific impact of a Conservative or Liberal election victory by including variables such as sector-specific policies or campaign contributions. Unfortunately, such data is not availabe on a systematic basis for the 1988 election campaign. Note, however, that I will be controling for firm size and multinational status as two obvious omitted variables. So any differential impact of a Conservative election victory across firms of different sizes or MNE status will be accounted for.

$$\frac{\pi_{i,C} - \pi_{i,NC}}{\pi_{i,NC}} = \frac{d\pi^E}{\lambda_{C,t+1} - (1 + d\pi^E)\,\lambda_{C,t}}.$$

Using our earlier estimate $d\pi^E$ from (4) and estimates of $\lambda_{C,t+1}$ and $\lambda_{C,t}$, the estimated implied profit change is:

$$d\pi^{CUSFTA} = \frac{\widehat{\pi_{i,C} - \pi_{i,NC}}}{\pi_{i,NC}} = \frac{\widehat{d\pi^E}}{\hat{\lambda}_{C,t+1} - \left(1 + \widehat{d\pi^E}\right)\hat{\lambda}_{C,t}}. \tag{5}$$

For example, if an event changes the implementation probability from 0% to 100%, $\hat{\lambda}_{C,t+1} = 1$ and $\hat{\lambda}_{C,t} = 0$, implying that $\widehat{\frac{\pi_{i,C} - \pi_{i,NC}}{\pi_{i,NC}}} = \widehat{d\pi^E}$. If the increase in the implementation probability is less than that, $\widehat{\frac{\pi_{i,C} - \pi_{i,NC}}{\pi_{i,NC}}} > \widehat{d\pi^E}$. Intuitively, because the event-induced profit increase captures only part of the full profit increase due to CUSFTA, it needs to be weighted up by the change in implementation probabilities.

As I explain in more detail in Section 4.3, the only event for which there is reliable information about ex-ante and ex-post implementation probabilities is the election event (November 21 and 22). Thus, I will calculate the profit change implied by CUSFTA for this event only. For the other events, I can still compute the event-induced profit changes and decompose the total change into parts due to the three types of tariff reductions and a residual part.

Discussion. Before turning to a discussion of data sources, it is useful to reiterate how important the different assumptions made so far are for the subsequent results. If one is mainly interested in the *qualitative* effects of tariff reductions on firm-level profits, those assumptions can be significantly relaxed. For example, it would be possible to allow for more complex links between profits and dividends, as long as there is a positive correlation between changes in these variables. Similarly, share prices do not need to fully and immediately reflect all relevant information. What is needed is only that new information about the likelihood of CUSFTA's implementation moves share prices to a statistically detectable extent within the length of my event windows (i.e., one or two days).

By contrast, the second part of the analysis, which *quantifies* the impact of tariff reductions on profits, requires stronger assumptions. In order to obtain correct estimates, I require the link between profits and stock prices postulated by the dividend discount model to hold as specified above. I also need a stronger form of market efficiency (all new information has to be fully priced in during the event window) and an assumption about pre- and post-event implementation probabilities. As such, the results related to the quantification of implied profit changes (Section 4.3) should be treated as more speculative than the results on the impact of tariff changes on abnormal returns (Sections 4.1 and 4.2). As discussed, the latter will tell us about the qualitative effects of tariff reductions on profit changes under only relatively mild assumptions.

3.2 Data Sources

For the estimation of (3) we need data on daily returns of individual stocks, the three types of tariff cuts and a selection of firm-level control variables. I restrict my analysis to the Canadian manufacturing sector to ensure the availability of tariff data. Manufacturing has also been the focus of all of the existing literature on CUSFTA (e.g., Trefler, 2004) and was most directly affected by the free trade agreement because of the tradability of its output.

Stock price data are taken from Datastream for all Canadian manufacturing firms listed on U.S. or Canadian exchanges. I only use stocks for which I have one year of return data before the relevant events which is the standard pre-event window length in the literature (see Binder, 1998). This yields a total of 403 Canadian manufacturing firms.

For my firm-level controls, I use data on firm sales and employment from Datastream. Both serve as proxies for firm size and will control for possible differences in average firm size across sectors that might be correlated with my tariff reduction measures. I also define a binary variable for a firm's multinational enterprise (MNE) status which takes the value of one if a firm either reports positive foreign affiliate sales or owns assets abroad. Unfortunately, data availability for any kind of firm-level variable for the period in question is relatively poor in Datastream or other compatible sources such as Compustat. Even for basic variables such as sales and employment, I only have data for 247 and 210 firms, respectively, and I can observe MNE status for only 194 firms. Thus, below I will present results for both the larger sample without controls and for the reduced sample where data on these controls is available.

My tariff data are from Trefler (2004) who calculates ad-valorem import tariffs for the U.S. and Canada for manufacturing industries at the four-digit level of the Canadian Standard Industrial Classication of 1980. I construct the intermediate input tariff for Canadian industry j as the weighted average of the Canadian import tariffs of all industries k supplying this industry. That is, $input\_tariff_j = \sum_k w_{kj} \times tariff_k$, where w_{kj} is the cost share of industry k in the production of goods in industry j in 1988. I construct input tariffs for 1988 and 1996 and use the difference as my measure of intermediate input tariff reductions due to CUSFTA. I map all three sets of tariffs into the industry classification used by Datastream (the Industry Classification Benchmark, ICB) which classifies manufacturing firms into 20 broad industries.[8]

Table 2 presents descriptive statistics for the above variables, broken down by the 20 ICB industries. On average, the ad-valorem reductions in Canadian import tariffs and intermediate input tariffs brought about by CUSFTA were 4.4 and 4.7 percentage points, respectively. This is approximately twice as large as the cut in U.S. import tariffs which were lower to begin with. All three tariff variables show substantial variation across sectors, with reductions of up to 13 percentage points for Canadian import tariffs, up to 9 percentage points for U.S. import tariffs, and up to 8 percentage points for intermediate input tariffs. As Trefler (2004) points out, many of these high-tariff-cut industries were also characterized by low profit margins in 1988, so that

[8] See Table 2 for a list of these industries. I use detailed descriptions of individual industries obtained from Datastream and Statistics Canada to construct a mapping from Trefler's 213 Canadian Standard Industrial Classification (CANSIC) industries to the 20 ICB industries used in this paper. This mapping was unique in 90% of cases, in the sense that each CANSIC industry could be mapped into one ICB industry only. I aggregate the tariff data to the ICB level by taking weighted averages across all CANSIC categories mapping into an ICB industry, using 1988 output shares of CANSIC industries as weights. Output data are also from Trefler (2004).

the protection offered by the pre-CUSFTA tariff barriers was non-negligible.

Table 2 also shows that the firms in my sample are large in terms of the value of their overall sales (column 3), which is unsurprising given the focus on publicly traded firms.[9] Nevertheless, there is substantial variation within most sectors, with firm sizes reaching from small start-ups with sales of less then a million Canadian dollars to big corporations with billions of dollars in shipments (see columns 4-5).[10] In terms of overall economic activity, my sample is also quite representative of Canadian manufacturing, with the firms in my sample accounting for C$186 billion or approximately two thirds of total Canadian manufacturing sales in 1988.

4 Results

4.1 Baseline Results

For my baseline results, I estimate (3) separately for my four events, excluding firm-level controls for the time being to maximize sample size (Table 3). I discuss the sign and significance pattern for each of the three tariff variables in turn. On event dates which increased the likelihood of CUSFTA's implementation (events 1 and 4), higher future Canadian tariff cuts (i.e., a more negative $d\tau_{CAN}$) were associated with lower abnormal returns. For events which decreased CUSFTA's implementation probability (events 2 and 3), we find the opposite sign pattern. With the exception of event 2, the estimated coefficients are highly statistically significant. On average, a one percentage point reduction in Canadian tariffs is associated with a 0.1 percentage point lower abnormal return. This is consistent with Baggs and Brander (2006) who, looking at the same liberalization episode, found that declining domestic tariffs were associated with declining (accounting) profits of Canadian manufacturing firms.

Future reductions in intermediate input tariffs were associated with higher abnormal returns on event dates 1 and 4, and lower abnormal returns on event dates 2 and 3. Again, these effects are statistically significant throughout and suggest that a one-percentage point reduction in intermediate input tariffs increased abnormal returns by up to 0.3 percentage points. Existing research has shown that reductions in input tariffs are associated with significantly higher firm-level productivity (e.g., Amiti and Koenings, 2007). Insofar as higher productivity is associated with higher profitability, the results in Table 3 are also consistent with these earlier findings.

The sign and significance patterns are less clear for U.S. tariff reductions. The coefficients are insignificant for events 1-3 and significant and *positive* for event 4, indicating that higher future U.S. tariff reductions were associated with lower abnormal returns. (Recall that event 4 significantly increased the likelihood of CUSFTA's implementation.) The fact that lower tariffs in the Canadian manufacturing firms' main export market should be associated with lower profits is counterintuitive and is also inconsistent with Baggs and Brander (2006) who found a positive profit impact of U.S. tariff reductions. I will return to this initially puzzling finding in Section 4.2. below.

[9] The descriptive statistics on firm sales are based on the smaller sample of 247 firms (see above).

[10] There also is a substantial fraction of non-exporters in my sample which will be informative for the interpretation of the U.S. tariff results below. Among the 54 firms for which I have information on exports, 30% report no export sales.

4.2 Robustness Checks

Firm-Level Covariates. In Table 4, I include my firm-size controls. In the first column for each event, I use (the log of) a firm's sales; the second column includes (the log of) firm employment; and the third column controls for MNE status.

Including these additional controls yields qualitatively similar results to my baseline in Table 3. There are some differences in terms of coefficient magnitudes but this seems to be mainly due to the substantially reduced sample size (247, 210 or 194 firms instead of 403 firms). To demonstrate this, Appendix Table A.1 reproduces the baseline results without firm covariates for the smaller samples for which I have firm sales, employment and MNE status, respectively. With the exception of some of the results for event 3, the corresponding results are close to the ones with covariates reported in Table 4, indicating that most of the changes in coefficient magnitudes seem to be driven by the different sample compositions, rather than by the inclusion of additional firm-level controls. In any case, the qualitative pattern of the results is as before. Future reductions in Canadian input tariffs are associated with lower abnormal returns and reductions in intermediate input tariffs are associated with higher abnormal returns; the coefficient on U.S. tariff reductions is again not consistently significant across events and has the "wrong" sign whenever it is significant (indicating that U.S. tariff reductions are associated with lower abnormal returns).

The firm sales and employment controls themselves enter positively and significantly for events 1 and 4, and negatively and significantly for events 2 and 3, indicating that larger firms seem to have benefited more from increases in CUSFTA's implementation likelihood. The sign and significance patterns for MNE status are less consistent, with the results for events 1 and 3 indicating that MNE status is associated with lower abnormal returns when the likelihood of CUSFTA's implementation increases, while the results for event 2 suggest the opposite. (The MNE dummy is not significant for event 4.)

In Table 5, I include all three controls jointly which decreases the sample size to just 194 firms. Still, the results are qualitatively similar to Table 3. The main exception is that the coefficient on U.S. tariffs is now consistently significant, althought it still has the "wrong" sign pattern. Note that because I now jointly include (the log of) firm employment and firm sales, the coefficient on firm sales can be interpreted as the impact of a basic measure of labor productivity. This measure has the same sign pattern as the log-sales variable included before, suggesting that more productive firms benefited from increases in CUSFTA's implementation likelihood.

Market Model, Fama-French Portfolios. In Table 6, I use two more sophisticated models for normal returns. Rather than simply calculating stock-specific means as in (3), I now include additional terms. In the first column for each event in Table 6, I include market portfolios and in the second column, I include Fama-French portfolios (Fama and French, 1993). In the former case, returns are modeled as:

$$r_{it} = \alpha_i + \gamma_i R_{mt} + \sum_{w=1}^{W} d_{wt} \left(\beta_0 + \beta_{1w} d\tau_{CAN,j} + \beta_{2w} d\tau_{US,j} + \beta_{3w} d\tau_{input,j} \right) + \eta_{it}. \quad (6)$$

where R_{mt} is the return on the market portfolio.[11] Including the Fama-French portfolios yields:

$$\begin{aligned} r_{it} &= \alpha_i + \gamma_{i1} R_{mt} + \gamma_{i2} SMB_t + \gamma_{i3} HML_t \\ &\quad + \sum_{w=1}^{W} d_{wt} \left(\beta_0 + \beta_{1w} d\tau_{CAN,j} + \beta_{2w} d\tau_{US,j} + \beta_{3w} d\tau_{input,j} \right) + \eta_{it}. \end{aligned} \tag{7}$$

where SMB_t is the return difference on portfolios of large and small stocks, and HML_t is the return difference portfolios of high and low book-to-market equity stocks.[12]

As the results in Table 6 demonstrate, using different models for normal returns leaves the baseline results unchanged qualitatively, and coefficient magnitudes are very similar to before. A possible explanation for this similarity is that systematic differences arising from the specification of normal returns only materialize over longer time horizons (see Andrade et al., 2001). For the one- or two-day windows used here, different normal return models yield almost identical results.

Two-Step Approach. Next, I demonstrate that my results are robust to using the more traditional two-step approach discussed in Section 3.1. For this approach, I estimate the return parameters α_i on pre-event data and compute abnormal returns for my event periods as $\hat{\varepsilon}_{iw} = r_{iw} - \hat{\alpha}_i$, where w denotes the event date in question. In the second step, I regress $\hat{\varepsilon}_{iw}$ on the same regressors as in my baseline specification, using observations during the event window only. That is,

$$\hat{\varepsilon}_{it} = \sum_{w=1}^{W} d_{wt} \left(\beta_0 + \beta_{1w} d\tau_{CAN,j} + \beta_{2w} d\tau_{US,j} + \beta_{3w} d\tau_{input,j} \right) + \nu_{it}. \tag{8}$$

Because the dependent variable for the second step is generated, I use a cluster-bootstrapping procedure to calculate standard errors.[13] As expected, the two-step procedure generates coefficient estimates and standard erros which are almost identical to my baseline specification (Table 7).[14]

Log Returns and Changes in Sample Composition. In Tables 8-10, I examine the sensitivity of my results to potentially influential observations. In Table 8, I use log returns instead of simple returns, which reduces the importance of outliers in the dependent variable.

[11] I use the value-weighted CRSP portfolio as a proxy for the market portfolio as is standard in the literature.

[12] As Fama and French, I further subtract the one-month treasury bill rate from individual stock returns and the return to the market portfolio, R_{mt}. Data on all three factors were taken from Kenneth French's web page at Dartmouth which also contains additional information on their construction.

[13] The bootstrapping is carried out as follows. I draw 100 samples from the pre-event data. For each sample, I draw N clusters from the original data with replacement. Clusters consist of trading days for comparability with the clustering structure of the standard errors in my one-step estimations (see footnote 7). Accordingly, I set N to the number of trading days in my baseline pre-event sample. For each sample generated in this way, I compute abnormal returns and estimate equation (8). This generates a set of 100 estimates which I use to compute the standard errors of my coefficient estimates.

[14] Note that the coefficient estimates are not exactly the same because my baseline estimation technique implicitly also uses the event period to estimate the return parameters α_i. Given that my event period is short compared to the estimation period, however, the differences are quantitatively unimportant (see Fama, Fisher, Jensen and Roll, 1969).

In Table 9, I drop three sectors which combine manufacturing with non-manufacturing activities. These sectors are Healthcare Equipment and Services (which contains medical equipment and supplies production but also services such as operating hospitals), Oil Equipment & Services (which combines production of construction and mining machinery with services related to oil extraction), and Media (which includes printing/publishing but also broadcasting, advertising and public relations). As these sectors should be less affected by CUSFTA, it would be worrying if results were driven by their inclusion.

Finally, in Table 10, I drop three sectors which have less than ten firms each (compare Table 2).[15] This allows me to verify whether sectors which account for a small minority of firms have an undue influence on my results.

As seen in Tables 8-10, these additional robustness checks yield results which are qualitatively identical to my baseline results in Table 3, and are also mostly very close in terms of coefficient magnitudes.

Heterogeneous Impact of U.S. Tariff Reductions. In Table 11, we return to the results for U.S. tariffs. As discussed, these seem to contradict earlier findings on the impact of foreign tariff reductions (e.g., Baggs and Binder, 2006). One possible explanation is that there might be firm heterogeneity in the reaction to lower export tariffs. Theoretical models of heterogeneous firms do indeed suggest that general equilibrium effects working through labor markets or firm entry might lead to profit reductions for the less productive firms in each industry (Melitz, 2003; Melitz and Ottaviano, 2008). For example, if lower foreign tariffs lead to increased exports by the larger, more productive domestic firms only, the higher labor demand by these firms will lead to higher labor costs for all firms. If smaller, less productive firms cannot take advantage of better exporting opportunities (e.g., because paying fixed export costs is not profitable for them), this indirect effect will lower their profitability and thus their stock price.[16]

Table 11 looks at this hypothesis more closely by interacting U.S. tariff reductions with my measure of firm size for which data availability is best (log sales). That is, I now estimate:

$$r_{it} = \alpha_i + \sum_{w=1}^{W} d_{wt} \left(\beta_0 + \beta_{1w} X_i + \beta_{2w} d\tau_{CAN,j} + \beta_{3w} d\tau_{US,j} + \beta_{4w} d\tau_{inp,j} + \beta_{5w} d\tau_{US,j} X_i \right) + \eta_{it}. \tag{9}$$

where X_i denotes firm i's log sales. Table 11 shows that the coefficient on the interaction term (β_{5w}) is negative for events 1 and 4 (which increased the likelihood of CUSFTA's implementation) and positive for events 2 and 3 (which lowered the likelihood of CUSFTA's implementation). This suggests that larger firms observed higher abnormal returns on events 1 and 4 compared to smaller firms, and lower abnormal returns on events 2 and 3. Computing the total effect of U.S. tariff reductions as $\beta_{3w} dt_{US,j} + \beta_{5w} dt_{US,j} X_i$, I find that U.S. tariff reductions were associated with positive abnormal returns for the largest firms on events 1 and 4, and for the

[15] These sectors are Healthcare Equipment & Services, Pharmaceuticals & Biotechnology, and Tobacco.

[16] Note that even though my sample is composed of publicly traded firms, there is still a substantial fraction of non-exporters. Among the 54 firms for which I have information on exports, 30% report no export sales.

smallest firms on events 2 and 3.[17] This is consistent with a differential effect of export tariff reductions on large and small firms as postulated by recent heterogeneous firm models.[18]

4.3 Quantifying the Impact of Tariff Reductions on Firm Profits

So far I have established the following *qualitative* link between tariff reductions under CUSFTA and the stock market returns and profits of Canadian manufacturing firms. Lower Canadian import tariffs are associated with lower abnormal returns and thus lower future profits, whereas lower Canadian intermediate input tariffs lead to higher abnormal returns and profits. The pattern is more complicated for U.S. tariff reductions which seem to have increased profits of large firms but lowered profits of small firms.

I now turn to a quantification of my results using the methodology described in Section 3.1. The first step is to compute event-induced profit changes using (4). For each firm, I calculate the implied profit change due to the event, $\widehat{d\pi^E} = \hat{\varepsilon}_{it}/(1+\hat{\alpha}_i)$, where $\hat{\varepsilon}_{it} = r_{it} - \hat{\alpha}_i$ are the estimated abnormal returns during the event window. I then compute the total profit change across the Canadian manufacturing firms by weighting firm-level profit changes ($\widehat{d\pi^E}$) by firms' shares in the total market capitalization of all firms in my sample.[19] Using the modeling of abnormal returns ($\hat{\varepsilon}_{it}$) from (3), this can further be decomposed into parts due to changes in import, export and intermediate input tariffs:

$$\frac{\Pi_t \widehat{-\Pi}_{t-1}}{\Pi_{t-1}} \simeq \sum_i s_{it-1}\widehat{d\pi_i^E} = \sum_i s_{it-1}\frac{\hat{\beta}_0 + \hat{\eta}_{it}}{1+\hat{\alpha}_i} + \sum_{type}\sum_i s_{it-1}\frac{\hat{\beta}_{type}\tau_{type}}{1+\hat{\alpha}_i}, \tag{10}$$

where s_{it-1} denotes the share of firm i in the total market capitalization of the firms in my sample before the event, *type* denotes the three types of tariff reductions, and the coefficient estimates $\hat{\alpha}_i$, $\hat{\beta}_0$, $\hat{\beta}_{type}$ and $\hat{\eta}_{it}$ are obtained from (3).

The upper panel of Table 12 reports results for each of my four events. Events which raised the probability of CUSFTA's implementation (events 1 and 4) increased profits, whereas event which lowered this probability lead to lower implied future profits (event 2 and 3). The magnitude of the profit changes varies between -2.4% (event 3) and +0.97% (event 1). With the exception of event 1, intermediate input tariff reductions had the largest effects, followed by Canadian import tariff reductions. U.S. tariff reductions only had an economically significant impact for event 4, where they reduced overall profits by around -0.5%.[20]

[17] The minimum and maximum values of log(sales) in the 247-firm sample for which I have sales data are -6.7 and 9.7, respectively. So for event 4, for example, we have $2.1581 \times d\tau_{US,j} - 0.4124 \times d\tau_{US,j}X_i$, which is positive for $X_i = -6.7$ and negative for $X_i = 9.7$. Given that larger U.S. tariff reductions are coded as more negative values for $d\tau_{US,j}$, this implies positive abnormal returns for the largest firm and negative abnormal returns for the smallest firm.

[18] See Breinlich (2014) for an in-depth analysis of the consistency of stock price reactions to trade liberalization with the predictions of heterogeneous firm models.

[19] Formally, under the same assumption made so far, the change in total profits is $\frac{\Pi_t}{\Pi_{t-1}} = \sum_i \frac{S_{it-1}\pi_{it}}{S_{it-1}\pi_{it-1}}\frac{S_{it-1}\pi_{it-1}}{\Pi_{t-1}} = \sum_i \frac{\pi_{it}}{\pi_{it-1}}\left(\frac{S_{it-1}p_{it-1}(r_i-g_i)}{(1+g_i)}/\sum_j \frac{S_{jt-1}p_{jt-1}(r_i-g_i)}{(1+g_i)}\right)$, where S_{it-1} is the number of shares of firm i, p_{it-1} the price per share and $S_{it-1}p_{it-1}$ firm i's market capitalization before the event. Under the assumption that $\frac{r_i-g_i}{1+g_i}$ and $d\pi_i^E = \frac{\pi_{it}}{\pi_{it-1}}$ are uncorrelated, this is approximately equal to $\sum_i d\pi_i^E \frac{S_{it-1}p_{it-1}}{\sum_j S_{jt-1}p_{jt-1}}$.

[20] In light of my previous finding that U.S. tariff reductions had a heterogeneous impact across firms, with larger firms benefiting and smaller firms seeing reductions in profits, I have also computed a version of (10) where I use the interaction regression (9) to compute abnormal returns. As seen in Appendix Table 2, the total effect of

In a second step, I also compute the total profit change due to CUSFTA. As discussed, this requires an assumption about the pre- and post-event implementation probability of CUSFTA. Event 4 (the general election) is the only event for which these probabilities are known with relative certainty. According to a range of opinion polls in the week before the election (14-18 November), the vote shares and expected number of seats for the Conservatives were such that almost all commentators estimated the chances of a Conservative election victory at around 50% (Frizzell et al., 1989; Johnston et al., 1992). Given the parties' electoral platforms, it was also clear that a Conservative election victory would lead to a ratification of CUSFTA, and a Liberal/New Democrat victory would lead to the dismantling of the agreement. The publication of opinion polls on 19 November and the Conservative victory on 21 November immediately eliminated any uncertainty about CUSFTA's ratification, and the agreement was indeed ratified shortly afterwards by the new Conservative majority. Thus, the most plausible pre-event and post-event implementation probabilities for event 4 are 50% and 100%, respectively.

The second panel of Table 12 shows the implied change in profits due to CUSFTA for event 4. Having computed the implied profit change due to the event for each firm ($\widehat{d\pi^E}$), I use (5) together with $\hat{\lambda}_{C,t+1} = 1$ and $\hat{\lambda}_{C,t} = 0.5$ to obtain the firm-level profit change due to CUSFTA. Again, I use market capitalization shares to calculate a manufacturing-wide effect and equation (3) to decompose the total effect into effects due to individual tariff reductions. According to my estimates, CUSFTA increased total profits by 1.22%. Canadian and U.S. tariff reductions reduced profits by -0.47% and -0.97%, respectively, and lower intermediate input tariff increased profits by 2.62%.[21] That is, input tariff reductions were the most important driver of profit changes and ensured that the overall profit response to CUSFTA was positive.

5 Conclusions

In this paper, I used an event study approach to present novel evidence on the impact of trade liberalization on firm-level profits. The use of stock price reactions has several advantages when compared to the use of ex-post data on accounting profits. For example, they capture changes in expected lifetime profits, are not affected by the sometimes weak link between accounting and economic profitability, and can be used for forecasting purposes. An event study approach also helps disentangling the effects of trade liberalization from the large number of confounding factors which also affect profitability. These advantages come at the price of the need for stronger assumptions for part of my analysis.

Using the uncertainty surrounding the negotiation and ratification process of the Canada-United States Free Trade Agreement of 1989 (CUSFTA), I estimate the impact of different types of tariff reductions on the abnormal returns of Canadian manufacturing firms. I find that Canadian import tariff reductions lead to lower abnormal returns and thus future profits, whereas reductions in Canadian intermediate input tariffs had the opposite effect. The impact of U.S. tariff reductions is less clear and depends on the size of the affected firms. These

the U.S. tariff level term is slightly smaller than the effect associated with the interaction term in absolute terms, implying that profit decreases among smaller firms were outweighted by profit increases among larger firms.

[21] Once we allow the effect of U.S. tariff reductions to vary with firm size, the total profit impact of U.S. tariff reductions becomes again positive (see Appendix Table 2).

qualitative results on the link between tariff reductions and profits hold under only relatively mild assumptions, such as a positive correlation between dividends and profits and a very weak form of market efficiency.

I also calculated the total profit increase implied by my estimates which requires stronger assumptions on market efficiency and the link between changes in profits and share prices. My findings indicate that events which increased CUSFTA's implementation probability raised future implied per-period profits of Canadian manufacturing firms by up to 1%, and events which lowered the implementation probability decreased future per-period profits by up to -2.4%. Making assumptions about the pre- and post-event implementation probability of CUSFTA, I also computed the overall profit impact of CUSFTA itself. My results show that CUSFTA increased per-period profits by around 1.2%. This was mainly driven by intermediate input tariff reductions which more than offset the negative effect of Canadian import tariff reductions.

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Table 1: Summary of Events

Event Description	Event Date	Likelihood of CUSFTA's implementation
1. The United States and Canada reach an agreement on CUSFTA on Saturday, October 3, 1987	October 5, 1987	Increased
2. John Turner instructs the Liberal majority in the Canadian Senate to block the ratification of CUSFTA until after a general election.	July 20, 1988	Decreased
3. A Gallup poll published on the morning of November 7 shows a twelve percentage point lead for the oppositional Liberal Party.	November 7, 1988	Decreased
4. Three nationwide opinion polls put the Conservative Party ahead of the opposition on Saturday, Nov. 19. The Conservatives win the election on November 21.	November 21 and 22, 1988	Increased

Table 2: Summary Statistics

Industry	#	Sales (mean)	Sales (min)	Sales (max)	$d\tau_{CAN}$	$d\tau_{US}$	$d\tau_{INPUT}$
Aerospace & Defense	10	336.7	39.5	1456.4	-2.7%	-2.6%	-5.6%
Automobiles & Parts	11	3094.4	113.2	15943.3	-0.4%	-0.2%	-3.7%
Beverages	14	1212.2	4.7	4611.0	-11.0%	-1.8%	-5.6%
Chemicals	15	387.3	32.8	1385.4	-5.2%	-4.5%	-4.8%
Construction & Materials	26	639.8	0.7	4715.0	-6.0%	-2.9%	-4.5%
Electronic & Electrical Equipment	32	352.5	0.1	1797.7	-3.3%	-2.7%	-5.5%
Food Producers	30	669.4	3.2	3804.0	-4.3%	-2.2%	-6.1%
Forestry & Paper	23	1183.3	43.1	5819.1	-3.3%	-0.6%	-4.7%
General Industrials	11	1949.9	1.5	6499.8	-7.5%	-2.8%	-4.3%
Healthcare Equipment & Services	7	68.1	0.3	205.9	-4.3%	-2.8%	-4.9%
Household Goods	28	121.0	10.4	450.5	-8.2%	-3.0%	-6.0%
Industrial Engineering	32	303.1	2.7	1737.5	-0.8%	-0.4%	-3.3%
Industrial Metals	29	1417.3	0.02	10175.0	-2.8%	-2.0%	-5.4%
Leisure Goods	11	478.0	93.7	1110.5	-4.6%	-3.0%	-4.7%
Media	35	475.6	0.2	4467.9	0.0%	0.0%	-4.7%
Oil Equipment & Services	53	479.8	0.7	3941.0	-2.3%	-1.5%	-3.5%
Personal Goods	14	461.0	8.7	1217.2	-12.7%	-8.7%	-7.5%
Pharmaceuticals & Biotechnology	8	26.7	0.01	156.3	-4.7%	-2.3%	0.0%
Technology Hardware & Equipm.	12	827.8	2.7	6451.3	-1.6%	-1.9%	-3.3%
Tobacco	2	2629.2	413.9	4844.5	-1.4%	0.0%	-5.7%
Total (Sum or Mean)	403	765.3	0.01	15943.3	-4.4%	-2.3%	-4.7%

Notes: Table shows the number of firms per industry, firm sales (mean, minimum and maximum per industry, in mill. $CND), and average tariff cuts implemented under CUSFTA. Sales data is only available for 247 firms. See text for details.

Table 3: Baseline Results

	Event 1	Event 2	Event 3	Event 4
$d\tau_{CAN}$	0.1399	-0.0101	-0.1650	0.0696
	(23.4154)***	(1.6876)*	(18.1434)***	(3.7758)***
$d\tau_{US}$	0.0115	-0.0142	0.0058	0.3294
	(0.9954)	(1.2786)	(0.3925)	(11.1193)***
$d\tau_{INPUT}$	-0.0360	0.1139	0.1937	-0.2836
	(1.9665)*	(6.4251)***	(9.7394)***	(7.1206)***
Constant (β_0)	0.0059	0.0057	-0.0094	0.0000
	(5.6052)***	(5.7705)***	(9.0801)***	-0.0438
Firms	403	403	403	403
Event Window	Oct. 5, 1987	July 20, 1988	Nov. 7, 1988	Nov. 21-22, 1988
Length Event Window	1 day	1 day	1 day	2 days
Observations Event Window	403	403	403	806

Notes: Table shows cumulative average abnormal returns from OLS regressions (figures in brackets are t-stats based on standard errors clustered per trading day). The dependent variable is daily stock returns. See text for specification details (equation 3). The independent variables shown in the table are Canadian tariff reductions ($d\tau_{CAN}$), U.S. tariff reductions ($d\tau_{US}$) and Canadian intermediate input tariff reductions ($d\tau_{INPUT}$). *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 4: Firm-Size Controls (Sales, Employment, MNE Status separately included)

	Event 1			Event 2			Event 3			Event 4		
$d\tau_{CAN}$	0.0329	0.0636	0.047	0.0289	0.0144	0.0309	-0.2017	-0.2046	0.0207	0.2454	0.2555	0.0775
	(4.9444)**	(9.0102)**	(7.4845)**	(4.2764)**	(2.0172)*	(4.9920)**	(15.672)**	(15.331)**	(1.4013)	(9.4212)**	(9.4535)**	(2.6036)**
$d\tau_{US}$	0.2004	0.0335	0.0874	-0.1284	-0.1298	-0.2205	-0.0117	-0.085	-0.2902	0.0158	0.0004	0.3386
	(15.151)**	(2.3918)*	(7.6237)**	(9.3986)**	(8.7824)**	(19.146)**	(0.4955)	(3.3190)**	(10.126)**	(0.3328)	(0.0091)	(5.9098)**
$d\tau_{INPUT}$	-0.0669	-0.0924	-0.1125	0.0670	0.0764	0.2498	-0.0919	-0.0823	0.0169	-0.0937	-0.1536	-0.2982
	(3.4306)**	(4.2762)**	(6.8719)**	(3.5470)**	(3.7327)**	(15.192)**	(3.5954)**	(3.4165)**	(0.5059)	(1.8253)+	(3.1732)**	(4.4405)**
log(sales)	0.0014			-0.0012			-0.0037			0.0027		
	(13.360)**			(12.127)**			(24.925)**			(8.8635)**		
log(empl.)		0.001			-0.0011			-0.0033			0.0014	
		(8.0697)**			(9.8232)**			(20.700)**			(4.5625)**	
MNE			-0.0051			-0.0012			0.0065			-0.0003
			(19.8981)**			(4.7968)**			(13.477)**			(0.3343)
Const. (β_0)	-0.0020	-0.0046	0.0071	0.0102	0.0125	0.0116	-0.0077	-0.0036	-0.0245	-0.0002	0.0004	0.0058
	(1.6803)+	(3.5580)**	(7.3116)**	(9.3393)**	(10.761)**	(12.340)**	(6.1117)**	(2.4381)*	(16.129)**	(0.0903)	(0.1400)	(1.9142)+
Firms	247	210	194	247	210	194	247	210	194	247	210	194
Event Window	Oct. 5, 1987			July 20, 1988			Nov. 7, 1988			Nov. 21-22, 1988		
Length Ev. Window	1 day			1 day			1 day			2 days		
Obs. Event Window	247	210	194	247	210	194	247	210	194	494	420	388

Notes: Table shows cumulative average abnormal returns from OLS regressions (figures in brackets are t-stats based on standard errors clustered per trading day). The dependent variable is daily stock returns. See text for specification details (equation 3). The independent variables shown in the table are Canadian tariff reductions ($d\tau_{CAN}$), U.S. tariff reductions ($d\tau_{US}$), Canadian intermediate input tariff reductions ($d\tau_{INPUT}$) and firm-level controls (sales, employment and MNE status). +, *, and ** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 5: Firm-Size Controls (Sales, Employment, MNE Status jointly included)

	Event 1	Event 2	Event 3	Event 4
$d\tau_{CAN}$	0.0822	0.0131	-0.0312	0.1034
	(13.7647)***	(2.2273)**	(1.9881)**	(3.2707)***
$d\tau_{US}$	0.0498	-0.1649	-0.1392	0.3091
	(4.5426)***	(14.8742)***	(5.1727)***	(5.7469)***
$d\tau_{INPUT}$	-0.2198	0.1329	-0.0844	-0.2701
	(11.9226)***	(7.1820)***	(2.5527)**	(4.0742)***
log(sales)	0.002	-0.0031	-0.0079	0.0054
	(11.7966)***	(18.4936)***	(33.9468)***	(11.5971)***
log(empl.)	-0.0017	0.0008	0.0054	-0.0051
	(9.5943)***	(4.6910)***	(16.9523)***	(7.9843)***
MNE	-0.0043	0.0023	0.0109	0.0002
	(17.8044)***	(9.5825)***	(19.3515)***	(0.2417)
Constant (β_0)	0.0043	0.015	-0.0301	0.016
	(4.2286)***	(14.9140)***	(14.3918)***	(3.8121)***
Firms	194	194	194	194
Event Window	Oct. 5, 1987	July 20, 1988	Nov. 7, 1988	Nov. 21-22, 1988
Length Event Window	1 day	1 day	1 day	2 days
Observations Event Window	194	194	194	388

Notes: Table shows cumulative average abnormal returns from OLS regressions (figures in brackets are t-stats based on standard errors clustered per trading day). The dependent variable is daily stock returns. See text for specification details (equation 3). The independent variables shown in the table are Canadian tariff reductions ($d\tau_{CAN}$), U.S. tariff reductions ($d\tau_{US}$), Canadian intermediate input tariff reductions ($d\tau_{INPUT}$) and firm-level controls (sales, employment and MNE status). *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 6: Market Model, Fama-French Portfolios

	Event 1		Event 2		Event 3		Event 4	
$d\tau_{CAN}$	0.1383	0.1371	-0.0163	-0.0187	-0.1305	-0.1165	0.0649	0.0984
	(22.9896)***	(16.5828)***	(2.5845)**	(2.4945)**	(9.1041)***	(4.7174)***	(3.5121)***	(2.8257)***
$d\tau_{US}$	0.0136	0.0178	-0.0137	-0.0049	-0.0099	-0.046	0.3319	0.2724
	(1.1224)	(0.9646)	(1.0218)	(0.3304)	(0.4886)	(1.3766)	(10.7870)***	(5.2782)***
$d\tau_{INPUT}$	-0.0342	-0.0400	0.1313	0.1332	0.1513	0.1621	-0.2752	-0.2701
	(1.7964)*	(1.5139)	(6.2926)***	(5.2220)***	(6.2398)***	(4.9809)***	(6.6843)***	(4.3515)***
Constant (β_0)	0.0055	0.0005	0.0042	0.0022	-0.0069	-0.0066	-0.0006	-0.0031
	(5.3678)***	(0.3698)	(3.8728)***	(1.8805)*	(5.9782)***	(4.4387)***	(0.3267)	(1.0529)
Normal Returns Model	Market Model	FF-Portfolios	Market Model	FF-Portfolios	Market Model	FF-Portfolios	Market Model	FF-Portfolios
Firms	403		403		403		403	
Event Window	Oct. 5, 1987		July 20, 1988		Nov. 7, 1988		Nov. 21-22, 1988	
Length Event Window	1 day		1 day		1 day		2 days	
Observations Event Window	403		403		403		806	

Notes: Table shows cumulative average abnormal returns from OLS regressions (figures in brackets are t-stats based on standard errors clustered per trading day). The dependent variable is daily stock returns. See text for specification details (equations 6 and 7). The independent variables shown in the table are Canadian tariff reductions ($d\tau_{CAN}$), U.S. tariff reductions ($d\tau_{US}$) and Canadian intermediate input tariff reductions ($d\tau_{INPUT}$). *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 7: Two-Step Approach

	Event 1	Event 2	Event 3	Event 4
$d\tau_{CAN}$	0.1399	-0.0101	-0.1660	0.0697
	(24.7971)***	(1.6597)*	(20.651)***	(3.5042)***
$d\tau_{US}$	0.0115	-0.0144	0.0061	0.3321
	(0.9411)	(1.2589)	(0.4569)	(12.1169)***
$d\tau_{INPUT}$	-0.0360	0.1140	0.1945	-0.2840
	(1.9113)*	(6.7428)***	(10.6304)***	(7.0976)***
Constant (β_0)	0.0059	0.0057	-0.0094	-0.0001
	(4.7925)***	(5.3141)***	(8.3236)***	(0.0421)
Firms	403	403	403	403
Event Window	Oct. 5, 1987	July 20, 1988	Nov. 7, 1988	Nov. 21-22, 1988
Length Event Window	1 day	1 day	1 day	2 days
Observations Event Window	403	403	403	806

Notes: Table shows results for OLS regressions of estimated cumulative average abnormal returns on the independent variables listed in the first column (figures in brackets are t-stats based on cluster-bootstrapped standard errors; clusters consist of trading days). See text for specification details (Section 4.2 and equation 8). The independent variables shown in the table are Canadian tariff reductions ($d\tau_{CAN}$), U.S. tariff reductions ($d\tau_{US}$) and Canadian intermediate input tariff reductions ($d\tau_{INPUT}$). *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 8: Log Returns

	Event 1	Event 2	Event 3	Event 4
$d\tau_{CAN}$	0.1389	-0.0119	-0.1349	0.0311
	(23.0362)***	(1.9756)**	(14.5165)***	(1.6614)*
$d\tau_{US}$	0.0061	-0.006	-0.0314	0.298
	(0.5524)	(0.5510)	(2.0807)**	(9.8509)***
$d\tau_{INPUT}$	-0.0036	0.1383	0.1525	-0.1762
	(0.2378)	(8.8855)***	(8.3074)***	(4.8043)***
Constant (β_0)	0.0077	0.0076	-0.0113	0.0029
	(8.5713)***	(8.7386)***	(11.9403)***	-1.5412
Firms	403	403	403	403
Event Window	Oct. 5, 1987	July 20, 1988	Nov. 7, 1988	Nov. 21-22, 1988
Length Event Window	1 day	1 day	1 day	2 days
Observations Event Window	403	403	403	806

Notes: Table shows cumulative average abnormal returns from OLS regressions (figures in brackets are t-stats based on standard errors clustered per trading day). The dependent variable is daily log returns. See text for specification details (equation 3). The independent variables shown in the table are Canadian tariff reductions ($d\tau_{CAN}$), U.S. tariff reductions ($d\tau_{US}$) and Canadian intermediate input tariff reductions ($d\tau_{INPUT}$). *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 9: Drop Mixed Sectors

	Event 1	Event 2	Event 3	Event 4
$d\tau_{CAN}$	0.1694	-0.0266	-0.1841	0.1071
	(27.1213)***	(4.2636)***	(18.4731)***	(5.3004)***
$d\tau_{US}$	0.0718	-0.0156	0.016	0.2926
	(6.2138)***	(1.3957)	-1.1013	(10.0518)***
$d\tau_{INPUT}$	-0.1732	0.0881	0.1055	-0.2682
	(11.3376)***	(5.5947)***	(5.5201)***	(7.0047)***
Constant (β_0)	0.0021	0.0028	-0.0156	0.0035
	(2.3807)**	(3.3540)***	(16.0641)***	(1.8033)*
Firms	308	308	308	308
Event Window	Oct. 5, 1987	July 20, 1988	Nov. 7, 1988	Nov. 21-22, 1988
Length Event Window	1 day	1 day	1 day	2 days
Observations Event Window	616	616	616	616

Notes: Table shows cumulative average abnormal returns from OLS regressions (figures in brackets are t-stats based on standard errors clustered per trading day). The dependent variable is daily stock returns. See text for specification details (equation 3). The independent variables shown in the table are Canadian tariff reductions ($d\tau_{CAN}$), U.S. tariff reductions ($d\tau_{US}$) and Canadian intermediate input tariff reductions ($d\tau_{INPUT}$). *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 10: Drop Sectors with Less Than Ten Firms

	Event 1	Event 2	Event 3	Event 4
$d\tau_{CAN}$	0.141	-0.0174	-0.2077	0.1206
	(22.8040)***	(2.8303)***	(21.2907)***	(6.0908)***
$d\tau_{US}$	0.0128	-0.0255	-0.0489	0.3265
	(1.0801)	(2.2037)**	(3.1654)***	(10.5558)***
$d\tau_{INPUT}$	-0.0403	0.1625	0.4777	-0.5126
	(1.6593)*	(6.8261)***	(15.9363)***	(8.5341)***
Constant (β_0)	0.0059	0.0075	0.0019	-0.0083
	(4.8217)***	(6.2881)***	(1.4121)	(3.0556)***
Firms	386	386	386	386
Event Window	Oct. 5, 1987	July 20, 1988	Nov. 7, 1988	Nov. 21-22, 1988
Length Event Window	1 day	1 day	1 day	2 days
Observations Event Window	386	386	386	772

Notes: Table shows cumulative average abnormal returns from OLS regressions (figures in brackets are t-stats based on standard errors clustered per trading day). The dependent variable is daily stock returns. See text for specification details (equation 3). The independent variables shown in the table are Canadian tariff reductions ($d\tau_{CAN}$), U.S. tariff reductions ($d\tau_{US}$) and Canadian intermediate input tariff reductions ($d\tau_{INPUT}$). *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 11: Firm-Size Interaction Term for U.S. Tariff Reductions

	Event 1	Event 2	Event 3	Event 4
$d\tau_{CAN}$	0.0281	0.0296	-0.1918	0.2067
	(4.1720)***	(4.3394)***	(14.8566)***	(7.9132)***
$d\tau_{US}$	0.5046	-0.1664	-0.5569	2.1581
	(10.6501)***	(3.6022)***	(7.8266)***	(15.4375)***
$d\tau_{INPUT}$	-0.0604	0.0654	-0.0921	-0.0928
	(3.0785)***	(3.4359)***	(3.5997)***	(1.8076)*
$d\tau_{US}$*log(sales)	-0.0535	0.0067	0.105	-0.4124
	(7.3543)***	(0.9575)	(9.6960)***	(19.4446)***
log(sales)	0.0004	-0.0010	-0.0016	-0.0054
	(3.3183)***	(7.5391)***	(7.5474)***	(12.3391)***
Constant (β_0)	0.0033	0.0095	-0.0183	0.0416
	(2.3119)**	(6.7070)***	(10.2174)***	(11.6960)***
Firm Size Proxy	Sales	Sales	Sales	Sales
Firms	247	247	247	247
Event Window	Oct. 5, 1987	July 20, 1988	Nov. 7, 1988	Nov. 21-22, 1988
Length Event Window	1 day	1 day	1 day	2 days
Observations Event Window	247	247	247	247

Notes: Table shows cumulative average abnormal returns from OLS regressions (figures in brackets are t-stats based on standard errors clustered per trading day). The dependent variable is daily stock returns. See text for specification details (equation 3). The independent variables shown in the table are Canadian tariff reductions ($d\tau_{CAN}$), U.S. tariff reductions ($d\tau_{US}$), Canadian intermediate input tariff reductions ($d\tau_{INPUT}$), the log of firm sales and an interaction term between log(sales) and U.S. tariff reductions. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table 12: Implied Profit Change due to CUSFTA

Event	#4	#1	#2	#3
Total Profit Impact of Event	0.55%	0.97%	-0.13%	-2.40%
- Part due to Reductions in Canadian Import Tariffs	-0.23%	-0.47%	0.03%	0.55%
- Part due to Reductions in U.S. Tariffs	-0.48%	-0.02%	0.02%	-0.01%
- Part due to Reductions in Canadian Intermediate Input Tariffs	1.30%	0.17%	-0.52%	-0.89%
- Residual part	-0.04%	1.29%	0.34%	-2.06%
Total Profit Impact of CUSFTA	1.22%	-	-	-
- Part due to Reductions in Canadian Import Tariffs	-0.47%	-	-	-
- Part due to Reductions in U.S. Tariffs	-0.97%	-	-	-
- Part due to Reductions in Canadian Intermediate Input Tariffs	2.62%	-	-	-
- Residual part	0.04%	-	-	-
Assumed Change in Implementation Probability	50% to 100%	-	-	-

Notes: Table shows event-induced profits changes (upper panel) and profit changes due to CUSFTA (lower panel). The decomposition of total profit impacts is based on equation 10 in Section 4.3.

Table A.1: Regressions for Samples with Availability of Firm-Size Controls

	Event 1			Event 2			Event 3			Event 4		
$d\tau_{CAN}$	0.0327	0.0707	0.0575	0.0271	0.0076	0.0339	-0.1953	-0.2177	0.0113	0.241	0.2614	0.0780
	(4.9187)**	(10.109)**	(9.3260)**	(3.9924)**	(1.0778)	(5.6341)**	(15.182)**	(16.362)**	(0.7766)	(9.2469)**	(9.6890)**	(2.655)**
$d\tau_{US}$	0.2277	0.0425	0.1069	-0.1612	-0.1489	-0.216	-0.1678	-0.1691	-0.3281	0.1275	0.0376	0.3404
	(17.328)**	(3.0206)**	(9.2357)**	(11.878)**	(9.9590)**	(18.576)**	(6.8145)**	(6.2909)**	(11.065)**	(2.5804)*	(0.6975)	(5.741)**
$d\tau_{INPUT}$	-0.1503	-0.1554	-0.1309	0.1664	0.1575	0.2449	0.1952	0.1385	0.0560	-0.2998	-0.2517	-0.3001
	(7.8279)**	(7.8271)**	(8.1234)**	(8.8220)**	(8.0860)**	(15.136)**	(8.2931)**	(5.6640)**	(1.6056)	(6.3567)**	(5.1361)**	(4.301)**
Const. (β_0)	0.0019	0.0004	0.0036	0.008	0.0072	0.0108	-0.0148	-0.0184	-0.0196	0.0048	0.007	0.0055
	(1.6854)*	(0.3847)	(3.9084)**	(7.6086)**	(6.6631)**	(11.720)**	(11.960)**	(14.243)**	(11.772)**	(1.9626)+	(2.6949)**	(1.6765)+
Firms	247	210	194	247	210	194	247	210	194	247	210	194
Event Window	Oct. 5, 1987			July 20, 1988			Nov. 7, 1988			Nov. 21-22, 1988		
Length Ev. Window	1 day			1 day			1 day			2 days		
Obs. Event Window	247	210	210	247	210	210	247	210	210	494	420	420

Notes: Table shows cumulative average abnormal returns from OLS regressions (figures in brackets are t-stats based on standard errors clustered per trading day). The dependent variable is daily stock returns. See text for specification details (equation 3). Columns 1-3 for each event use the sample of firms for which data on firm sales, employment and multinational status are available, respectively. The independent variables shown in the table are Canadian tariff reductions ($d\tau_{CAN}$), U.S. tariff reductions ($d\tau_{US}$) and Canadian intermediate input tariff reductions ($d\tau_{INPUT}$). +, *, and ** denote statistical significance at the 10%, 5% and 1% level, respectively.

Table A.2: Implied Profit Change due to CUSFTA (Interaction Regression)

Event	#4	#1	#2	#3
Total Profit Impact of Event	0.67%	1.06%	-0.16%	-2.57%
- Canadian Import Tariffs	-0.64%	-0.09%	-0.09%	0.60%
- U.S. Tariffs	-2.87%	-0.67%	0.22%	0.74%
- Canadian Intermediate Input Tariffs	0.43%	0.28%	-0.30%	0.42%
- Interaction U.S. Tariffs – Firm sales	3.70%	0.48%	-0.06%	-0.94%
- Firm sales	-3.70%	0.33%	-0.74%	-1.15%
- Residual part	3.76%	0.73%	0.82%	-2.24%
Total Profit Impact of CUSFTA	1.46%	-	-	-
- Canadian Import Tariffs	-1.29%	-	-	-
- U.S. Tariffs	-5.77%	-	-	-
- Canadian Intermediate Input Tariffs	0.86%	-	-	-
- Interaction U.S. Tariffs – Firm sales	7.44%	-	-	-
- Firm sales	-7.45%	-	-	-
- Residual part	7.68%	-	-	-
Assumed Change in Implementation Probability	50% to 100%	-	-	-

Notes: Table shows event-induced profits changes (upper panel) and profit changes due to CUSFTA (lower panel). The decomposition of total profit impacts is based on equation 10 in Section 4.3.

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