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Summary of: Tariff Reduction and Employment in Canadian Manufacturing, 1988-1994

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Note of appreciation
Canada owes the success of its statistical system to a long-standing partnership between Statistics Canada, the citizens of Canada, its businesses, governments and other institutions. Accurate and timely statistical information could not be produced without their continued cooperation and goodwill.

I. Introduction

At the end of the 1980s, Canada and the United States reached an agreement to phase out import tariffs over a 10-year period beginning January 1st, 1989. This tariff reduction scheme was a major centrepiece of the Canada-U.S. Free Trade Agreement (FTA). The implementation of the FTA was followed by a recession, characterized by massive job cuts in manufacturing industries, which led to suggestions that employment losses were related to the reduction of trade barriers. Research on firm output and survival (Gu, Sawchuk and Whewell, 2003; Baggs, 2004) suggests the impact of tariff changes was different across industries and across firms within industries. Using firm-level data, this study investigates the impact of reduced Canadian and U.S. tariffs on Canadian manufacturing employment. The study also asks whether the impact was heterogeneous across firms with various productivity and leverage characteristics.[1]

II. Motivation

Immediately after the implementation of tariff reductions, employment dropped substantially in Canadian manufacturing industries.[2] From 1988 to 1994, total manufacturing employment declined by 10.8%, even more (-17.6%) among firms that existed before 1988 and survived at least two years beyond the agreement. It fell faster in industries experiencing the largest declines in import tariffs (Figure 1). In 25% of the 83 manufacturing industries experiencing the most significant tariff declines, employment dropped by one quarter; employment changed by 18.1% in the second quartile of industries with moderate changes in tariffs, and dropped by smaller margins in industries experiencing smaller tariff changes. This suggests that larger tariff cuts were associated with faster employment declines in the first few years of the FTA.

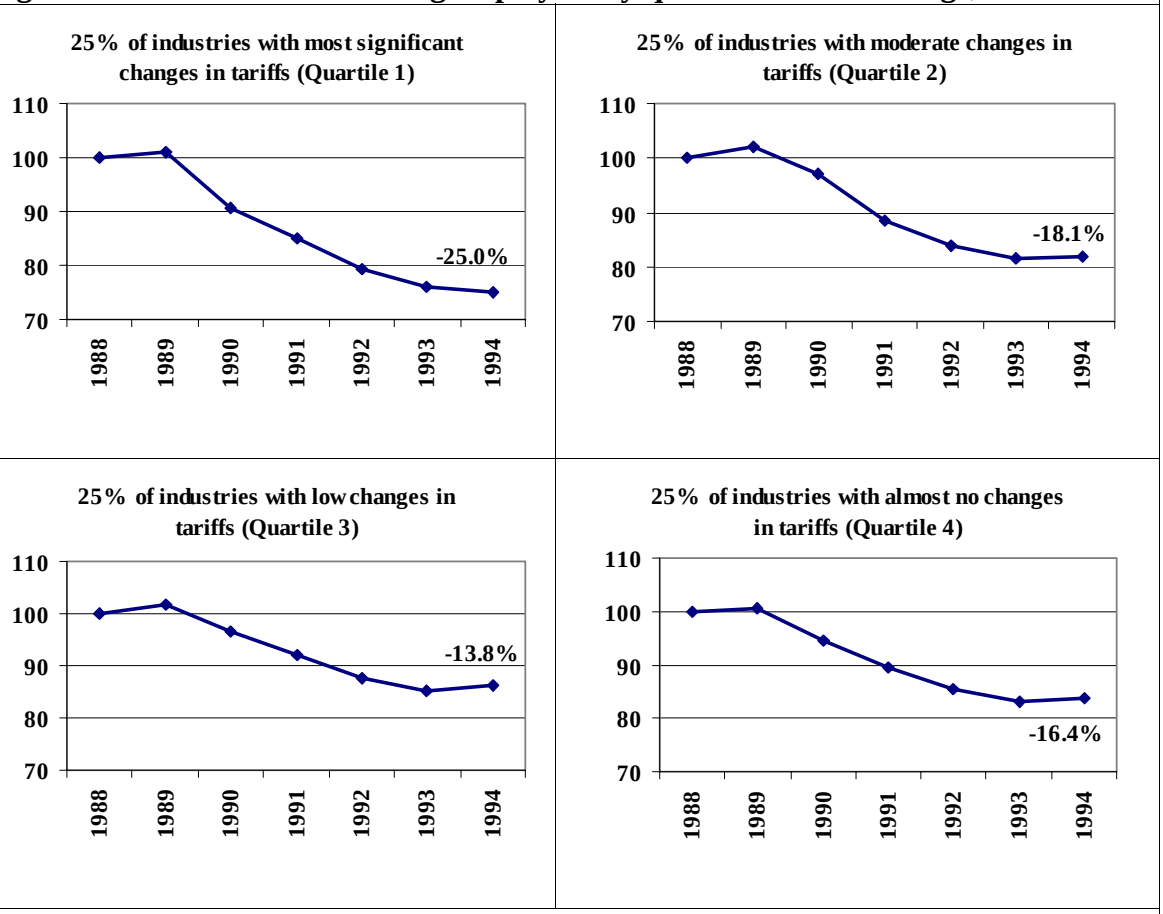
III. Background

Industry-level studies: Some studies have investigated the link between the reduction in tariffs and employment changes using industry-level data. Gaston and Trefler (1997) and Trefler (2004) find a significant association between employment changes and changes in Canadian tariffs across industries over the period 1988–1993, but show that job losses induced by the reduction of tariffs contributed to a relatively small fraction of total job losses experienced by the manufacturing sector at the beginning of the 1990s. Beaulieu (2000) examines the extent to which tariff changes affected the earnings and employment of different categories of workers in manufacturing industries. Using employment data over a 14-year period (1983-96) for 19 manufacturing industries, Beaulieu finds that Canadian tariff reductions lowered employment among production workers, but had little or no effect on non-production workers. This indicates that even within industries, the employment effect of tariff reductions can be different across firms employing proportionately more production workers.

1. This summary refers to the following study: Larochelle-Côté, S. *"Tariff Reductions and Employment in Canadian Manufacturing, 1988-1994."* Analytical Studies Research Paper Series. Catalogue no. 11F0019MIE2005258. Ottawa: Statistics Canada.

2. According to the Labour Force Survey of Statistics Canada, the proportion of the Canadian workforce employed in manufacturing industries remained relatively constant over the 1980s.

Figure 1: Index of manufacturing employees by quartile of tariff change, 1988-1994



Source: Longitudinal Employment Analysis Program, T2/LEAP file, surviving firms only.

Firm-level studies: Brander (1981) suggests that domestic import tariffs should reduce the quantity exported by foreign firms on local markets because they limit competition from abroad. Domestic import tariffs increase the profit margins of local firms by raising the cost structure of foreign firms in the same industry. As a result, changes in domestic tariffs should be positively associated with short-term changes in employment in local firms. This line of reasoning suggests that reductions in domestic tariffs should be associated with job losses in the short-run. Similarly, foreign import tariffs should reduce the quantity sent by local firms to foreign markets because they reduce the profit margin of local firms by raising the unit cost of products sold on foreign markets. As a result, changes in foreign tariffs should be negatively associated with employment in local firms. Hence, employment should rise in local firms when foreign tariffs fall.

Melitz (2003) argues that the existence of export market entry costs affects how the impact of trade is distributed across different types of firms. Only the most efficient firms should gain in market share and profits, while less efficient firms lose both, and are more likely to be forced out of business. This suggests that firms with higher productivity *a priori* should be better able to withstand negative shocks, such as the reduction of domestic tariffs, and be better positioned to take advantage of employment opportunities created by falling foreign tariffs. Similarly, less productive firms should be affected proportionately more than the average firm by the impact of reduction in domestic tariffs.

Financial condition (proxied with leverage in the current study) is another factor that may affect how firms respond to a change in tariffs. Firms with "deeper pockets" should be better able to withstand the impact of "bad" states (the reduction of domestic tariffs) and maximize the return of "good" states (the reduction of foreign tariffs). But firms with unhealthy balance sheets *a priori* will bear the brunt of deteriorating credit market conditions. Reduction in credit available to such firms will exacerbate the problems related to reduced net worth, causing them to reduce output and employment. Thus, firms with weaker balance sheets may be more affected by changes in domestic tariffs, and firms that are less financially constrained may benefit more from changes in foreign tariffs.

IV. Data and Method

The data used come from Statistics Canada's T2/LEAP data set. These data link T2 corporate tax records of manufacturing firms to Statistics Canada's "Longitudinal Employment Analysis Program" (LEAP). A firm enters LEAP when it registers for a payroll deduction account with Canada Revenue Agency (formerly Revenue Canada). It is linked with the Corporate Tax Statistical Universe (T2SUF), which tracks every incorporated firm in Canada filing a T2 form with Canada Revenue Agency. The two merged files form the T2/LEAP data used in this paper.[3] The sample includes figures from 1988 to 1994, for firms that existed prior to 1988, and survived at least two complete calendar years (1988 and 1989); the period corresponds to the implementation of the most significant tariff cuts negotiated under the FTA. The sample includes only figures for "surviving" firms. In other words, if a firm went out of business in 1990, it will have only two observations in the sample, corresponding to its 1988 and 1989 figures. The result is a sample of 183,080 "firm-year" observations, corresponding to 29,319 manufacturing firms.

Estimates of productivity and leverage at the beginning of the period (1988) were used to test whether the impact of tariff reduction differed across firms with various characteristics *a priori*. The measure of leverage employed in this study was the ratio of liabilities over assets. Estimates of Total Factor Productivity (TFP) were used to differentiate firms across productivity levels but similar results were found when labour productivity was used instead of TFP. The results of this paper are based on a fixed-effects model of employment in which Canadian and U.S. tariffs were interacted with productivity and leverage. These interaction terms allowed the impact of tariffs to be differentiated across firms with different attributes in terms of productivity and leverage.

V. Results

Base Model: Results from the base model indicate that the overall impact of tariff declines on employment was relatively small. However, the coefficients associated with Canadian and U.S. tariffs become larger and significant when the impact of tariff changes can be differentiated across firms with various productivity and leverage characteristics. This suggests that firms were not all equally affected by declining tariffs.

Productivity: Firms with low productivity were most affected by tariff changes, and this occurred for two reasons. First, declining domestic tariffs were associated with job losses in firms which were less productive *a priori*. This is consistent with other research showing that the decline of

3. The T2/LEAP excludes own-account self-employed but not self-employed owners of incorporated businesses, who are employees of the corporation.

Canadian tariffs accelerated the exit of least productive firms. It also suggests that firms with higher productivity were sheltered from the impact of declining tariffs.

Second, the fall in U.S. tariffs has been proportionately more beneficial for firms which were relatively *less* productive—not more. One possible explanation for this is that more productive firms were less likely to expand their activities because they were perhaps already exporting to the U.S. markets prior to the implementation of the tariff reduction scheme. In other words, it is possible that opportunities provided by falling U.S. tariffs were comparatively more valuable for firms with lower productivity levels.

However, the gains associated with falling U.S. tariffs in low productivity firms did not compensate for the loss of jobs induced by falling domestic tariffs. Over the period 1988 to 1994, low productivity firms[4] gained 6.5% more employment as a result of falling U.S. tariffs, but responded to falling domestic tariffs by cutting 21.6% of their workforce. Hence, low productivity firms lost 15.1% of their workforce in the face of declining domestic and U.S. tariffs (compared to a net loss of just 3.6% for firms with average productivity levels).

Leverage: Firms which were more heavily in debt downsized more in response to declining domestic tariffs. This supports the view that firms with "deeper pockets" were better able to adjust to increased competition from foreign firms and is also consistent with evidence suggesting that firms with larger financial constraints respond more to a sudden decline in product demand (Heisz and LaRochelle-Côté, 2004).

However, the results also suggest that firms with more debt may have benefited from the reduction of U.S. tariffs. This raises the possibility that high debt firms pursue strategies that raise returns in "good states of the world" and "lower returns in bad states". According to this theory, firms with more debt typically adopt financial strategies designed to maximize the returns to shareholders in case of a positive industrial change (such as declining U.S. tariffs). Likewise, such firms also pursue financial strategies designed to minimize returns to shareholders in the event of a negative shock (such as declining domestic tariffs). This is because the interests of bondholders normally take precedence over the interests of shareholders when more leveraged firms are facing insolvency, while shareholders gain most from a positive change in business conditions. Consequently, risk taking firms should benefit more from the opportunities created by U.S. tariffs, but should also experience greater damage when domestic protection falls.

VI. Conclusion

This paper finds that the impact of tariff changes varied across various categories of productivity and leverage. The results suggest the impact of falling domestic tariffs was larger in firms which were less productive a priori. The results also suggest that falling U.S. tariffs were associated with employment gains in low productivity firms, but these gains were too small to compensate for the losses induced by falling domestic tariffs. This paper also indicates that firms with more leverage downsized more in the face of changing domestic tariffs.

These results suggest that firms with high productivity and low leverage were less likely than others to feel the impact of declining U.S. and domestic tariffs.

4. Low-productivity firms are defined as those that were located one standard deviation under the average productivity level in 1988.

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