

# The Flattening Firm and Product Market Competition: The Effect of Trade Liberalization on Corporate Hierarchies

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## Online Appendix

**Table OA.1: Top 20 Industries with High U.S. Tariffs on Canadian Imports**

The third column shows the tariff faced by firms in the sample and used in the analysis, averaged by industry (3 digit SIC).

US SIC 87 (3-digit)	Industry Name	U.S. Tariffs on Canadian Imports 1986-1988 Average
302	Rubber & Plastics Footwear	36.06%
233	Women's, Misses, Juniors Outerwear	21.55%
211	Cigarettes	19.33%
225	Knitting Mills	16.81%
282	Plastics, Syn. Resins, Syn. Rubber, Cellulosic, Other Fibers, Ex. Glass	11.26%
202	Dairy Products	10.46%
314	Footwear, Except Rubber	10.01%
203	Canned, Frozen, Preserved Fruit & Vegetables	9.76%
287	Agricultural Chemicals	9.76%
221	Broadwoven Fabric Mills, Cotton	8.81%
364	Electric Lighting & Wiring Equipment	7.29%
201	Meat Products	7.16%
382	Lab. App., Analytical, Optical, Measuring & Controlling Instruments	6.94%
208	Beverages	6.77%
366	Telephone & Telegraph Apparatus	6.61%
375	Motorcycles, Bicycles & Parts	6.38%
284	Soap, Detergent, Cleaning Preparation, Perfumes, Cosmetics, & Other	6.13%
267	Converted Paper, Paperboard Products, Except Boxes	5.97%
329	Abrasive, Asbestos, Misc. Nonmetallic Mineral Products	5.83%
384	Surgical, Medical, & Dental Instruments & Supplies	5.72%

**Table OA.2: Examples of Canadian Companies in High Tariff Industries**

US SIC 87 (3-digit)	Industry Name	U.S. Tariffs on Canadian Imports 1986-1988 Average	Examples of Canadian Companies (Sales in U.S. \$)
211	Cigarettes	19.33%	Imperial Tobacco (\$4.2 b) Rothman's (\$400 m)
225	Knitting Mills	16.81%	Dominion Textiles (\$1.4 b)
282	Plastics, Syn. Resins, Syn. Rubber, Cellulosic, Other Fibers, Ex. Glass	11.26%	Nova Chemicals (\$4.8 b)
208	Beverages	6.77%	Seagram (\$4.5 b) Molson (\$2.1 b)
366	Telephone & Telegraph Apparatus	6.61%	Nortel Networks (\$6.1 b)

**Table OA.3: Evidence for Effect of FTA**

	<b>Panel A: Division Depth</b>				
	Div.Depth Canada> ROW Tariff	Div.Depth Canada> ROW Tariff 4 digit	Div.Depth Fast tariff reduction	Div.Depth Incl. Serv.	Div.Depth
	1a	2a	3a	4a	5a
AvT89*Post89	-5.523 [2.504]**	-12.019 [3.565]***	-5.491 [1.245]***	-3.21 [1.248]**	-3.398 [1.259]***
Exch.Rate*OriginImp.Pen.					0.806 [1.190]
Division FE	yes	yes	yes	Yes	yes
Division trends	yes	yes	yes	Yes	yes
Observations	2962	1545	1697	6965	5702
R-squared	0.04	0.08	0.084	0.023	0.032

  

	<b>Panel B: CEO Span of control</b>				
	CEO Span Canada> ROW tariff	CEO Span Canada> ROW tariff 4 digit	CEO Span Fast tariff Reduction	CEO Span Incl. Serv.	CEO Span
	1b	2b	3b	4b	5b
AvT89*Post89	18.137 [10.504]*	23.466 [6.351]***	5.648 [6.926]	7.545 [ 4.025]*	10.453 [4.155]**
Exch.Rate*OriginImp.Pen.					4.649 [7.736]
Firm FE	Yes	yes	yes	Yes	yes
Firm trends	Yes	yes	yes	Yes	yes
Observations	1073	512	531	2711	1962
R-squared	0.03	0.07	0.059	0.019	0.021

Notes: Std. Errors in brackets, clustered by industry (SIC4). All regressions include year dummies. All regressions also include the interaction of Post89 with US industry skill intensity, capital intensity and TFP growth pre-89 to account for tariff endogeneity (except col. 4 because these are not available for services industries), as well as  $\ln$  firm sales and  $\ln$  division employment. Div Depth is the number of managers between the DM and the CEO. AvT89 is the average US tariff rate on Canadian imports in 86-88, by industry. Exch.Rate\*OriginImp.Pen is the bilateral Canada U.S. dollar exchange rate multiplied by the level of import penetration of the industry in 1988, Source: IMF-IFS and Bernard et al. (2006). Columns 1 and 2 restrict the sample to firms in industries with US tariffs on Canadian imports above the average tariff on imports from the rest of the world; col. 3 restricts the sample to firms in industries with the fastest scheduled tariff reductions (that had experienced at least 60% tariff reductions from their original level by 1994); col. 4 also includes services firms in the estimation, with AvT89=0; col. 5 includes the interaction of the Canada-US exchange rate and the level of import penetration in the industry before 1989.

Table OA.3: *Robustness Checks for the Effect of the FTA on Hierarchies*

Overall, the paper find systematic evidence that firms experiencing a larger shock following the trade liberalization (those in more protected industries prior to 1989) reduced division depth and increased CEO span of control more relative to firms less affected by the liberalization. While this effect is robust to a number of specifications, one might still question whether the liberalization with Canada was important to U.S. firms. In Table OA.3, we provide additional evidence that further supports our claim that the trade liberalization led U.S. manufacturing firms to flatten. All regressions replicate the specification of column 2 onwards in Tables 2 (division depth) and 3 (CEO span) in the paper and include firm/ division fixed effects and trends. The table shows that the effect of the FTA is larger in industries in which the cost of importing Canadian goods into the U.S. is higher relative to that for the rest of the world (columns 1 and 2). One should expect that tariff reductions will lead to greater competition and a bigger effect on flattening in industries where the US tariff on Canadian imports is higher than the rest of the world (ROW) tariff. Why? If the US tariff in an industry is above the ROW tariff, the cost of imports from Canada would decline by more relative to the cost in an industry with tariffs below the ROW tariff. We find the sub-sample of firms in industries that faced larger US tariff in comparison to the ROW tariff do flatten more.

The effect is also larger in industries in which the scheduled tariff reduction is faster (column 3). Our results are robust when we include service industry firms as the main control group, with an assigned tariff (AvT) of zero (column 4). This mitigates concerns that all we are capturing is a spurious trend. Finally, the results are also unchanged when we control for exchange rate fluctuations that may differentially affect industries with different levels of import penetration (column 5)