

The Variety Effects of Trade Liberalization

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The purposes of this paper:

- This paper assesses the variety effects of trade liberalization in the context of the Free Trade Agreement between Canada and the United States (CANUSFTA).
- The contribution of this paper:
 - It uses the WIPO cross-country trademark registration statistics to measure the recent trends in global trade in varieties.
 - it uses CIPO and USIPO trademark databases to track the bilateral trade in variety between Canada and the U.S. at detailed industrial levels

Why is this an important issue:

- Seeking the scale effect was the principal reason that Canada entered into a FTA with the U.S. in 1989. However, with more than a decade since the CANUSFTA has been in effect, the scale effect has unfortunately not been borne out empirically. Head and Ries (1999) found that the tariffs reduction in the U.S. increased plant scale in Canada by 10% on average, but this was largely offset by an 8.5 reduction in plant scale due to the reductions in Canadian tariffs. On net, therefore, the CANUSFTA had only a marginal impact on scale.
- Helpman (1998) downplays the significance of economics of scale. Product differentiation might limit the range of economics of scale. As the number of varieties increases, the output of each individual variety necessarily falls. He stresses that what matters is that there exists economies of scale, not their size.
- Feenstra (2002) argues if the elasticity of demand for product varieties is constant, consumption of each variety is likely to fall under free trade, because individuals are spreading their expenditures over more product varieties. Under such a circumstance, firms scale will not change at all, though the number of varieties consumed will increase due to those available from imports.

A review of literature:

- Caves (1981) says that product differentiation does not necessarily lead to greater intra-industry trade. If product differentiation has a strong information component, requiring substantial advertising by the firm in order to inform customers of its product's uniqueness, then language and cultural barriers to advertising in a foreign country may make product differentiation a barrier to intra-industry trade
- Haveman and Hummels (1999) finds that importers purchased a very small fraction of available varieties. They concluded that the existing trade models such as the monopolistic competition model might considerably overstate either the extent of product differentiation (incomplete specialization) or the degree to which consumers value that differentiation
- Russel Hillberry and Christine McDaniel (2002) found only a very marginal variety effect under the NAFTA. Most of the post-NAFTA changes in U.S. trade patterns were increases in the quantity of goods traded in HTS lines that were already traded in 1993
- The fundamental weakness of many of these studies: the HS lines considerably underestimate the number of varieties traded across the country. For instance, there are many car models, but only one HS code that covers them. A full examination of the variety of trade requires evidence on the full breadth of varieties produced.

Why trademarks?

- A trademark is a word, a symbol, a design, or a combination of these features to distinguish the goods or services of one person or organization from those of others in the marketplace. Trademarks come to represent not only actual goods and services, but also the reputation of the producer. As such, they are considered as valuable intellectual property. A registered trademark can be protected through legal proceedings from misuse and imitation
- A trademark performs the following four main economic functions:
 - It is one of the means of achieving product differentiation
 - It protects the public against confusion and deception, as well as the trademark owner's trade and business
 - It gives a market power to the enterprises that own them (through brand loyalty)
 - It is a prime instrument in advertising and selling the products
- The trademark registration statistics offer much rich information on the availability of varieties. Each trademark represents a unique variety, which distinguishes from others by its own designs, technologies, concepts, or ideas. The registration statistics contain the detailed information on the main characteristics of each trademark, the registration number, industrial classes, the name and address of the applicant, the owner of the trademark, the nationality of the owner, the date of registration, and others.

Global trade in variety

Table 1. Annual Average Cross-Country Trademark Registration, 1990-2000.

	US	Canada	UK	Japan	Germany	Spain	Switzerland	China	India
China	3625	125	685	1952	1905	255	956	77102	30
India	307	5	108	91	140	12	62	5	4565
Japan	6193	188	1077	131073	1430	171	755	97	7
Korea	3145	84	496	1840	710	56	425	38	7
Canada	4647	8416	311	336	379	64	200	37	7
Austria	874	28	253	134	2127	154	873	30	3
Finland	968	23	287	129	1279	107	433	25	2
France	5092	209	1069	810	4504	879	2039	92	7
Germany	2592	99	826	567	22958	276	1091	69	8
Ireland	1235	20	952	115	755	124	240	14	3
Italy	3415	91	1120	692	2258	385	1203	93	9
Norway	1297	30	399	158	1624	151	492	32	3
Portugal	1884	39	770	287	2198	1101	920	62	4
Spain	2748	61	943	472	1291	53172	598	60	5
Sweden	1264	36	393	185	1392	123	479	27	4
Switzerland	1561	53	414	235	2231	188	5301	44	3
UK	5266	278	23142	1028	3083	385	1167	77	32
Australia	4008	171	1028	582	724	74	417	47	12
New Zealand	2604	82	717	304	435	38	296	36	13
Brazil	1985	45	295	252	466	85	272	16	6
Argentina	5957	133	968	558	1118	564	810	32	9
Mexico	6448	174	464	356	757	360	462	30	5
USA	73686	2535	1556	1285	1887	296	722	110	39
Ave For. Reg. The Ratio of For. Reg. Over Dom. Reg. (%)	3051	205	688	562	1486	266	678	49	10
	4.1	2.4	3.0	0.4	6.5	0.5	12.8	0.1	0.2

Estimation results

Table 2. The Determinants of Global Trade in Variety

Variables	Parameter Estimates	t-statistics
Constant	-14.03528	-9.832357
y_i	0.365454	8.532996
y_j	0.245630	5.788625
py_i	0.706213	20.05190
py_j	-0.105936	-3.013511
Dis_j^i	-0.541819	-16.90024
Lan_j^i	0.802707	7.921156
t_j^i	0.217310	2.736747
f_i Australia	0.144272	0.953675
f_i Brazil	0.293154	1.757711
f_i Canada	0.124041	0.803184
f_i Switzerland	1.574166	10.54413
f_i China	0.485852	12.42470
f_i Germany	1.913054	10.30381
f_i Spain	1.096261	7.122069
f_i Finland	-0.217976	-1.533044
f_i France	1.847351	10.61162
f_i UK	1.532777	9.135715
f_i India	0.087257	5.580154
f_i Italy	1.506131	9.066492

Variables	Parameter Estimates	t-statistics
f_i Japan	0.682604	3.296985
f_i Korea	0.610631	4.030031
f_i Mexico	0.405210	2.617597
f_i USA	2.528950	11.54231
f_j Australia	0.722609	4.786037
f_j Brazil	-0.549002	-3.240389
f_j Canada	-0.237624	-1.543223
f_j Switzerland	0.025581	0.171540
f_j China	0.700212	3.514917
f_j Germany	0.035565	0.192720
f_j Spain	0.178654	1.164607
f_j Finland	-0.224229	-1.576640
f_j France	0.531485	3.038636
f_j UK	0.422334	2.528291
f_j India	-1.985353	-9.890453
f_j Italy	0.302856	1.831600
f_j Japan	0.356332	1.734706
f_j Korea	0.177119	1.172584
f_j Mexico	0.233299	1.511967
f_j US	0.638620	2.938193
$R^2 = 0.85$	N = 1105	

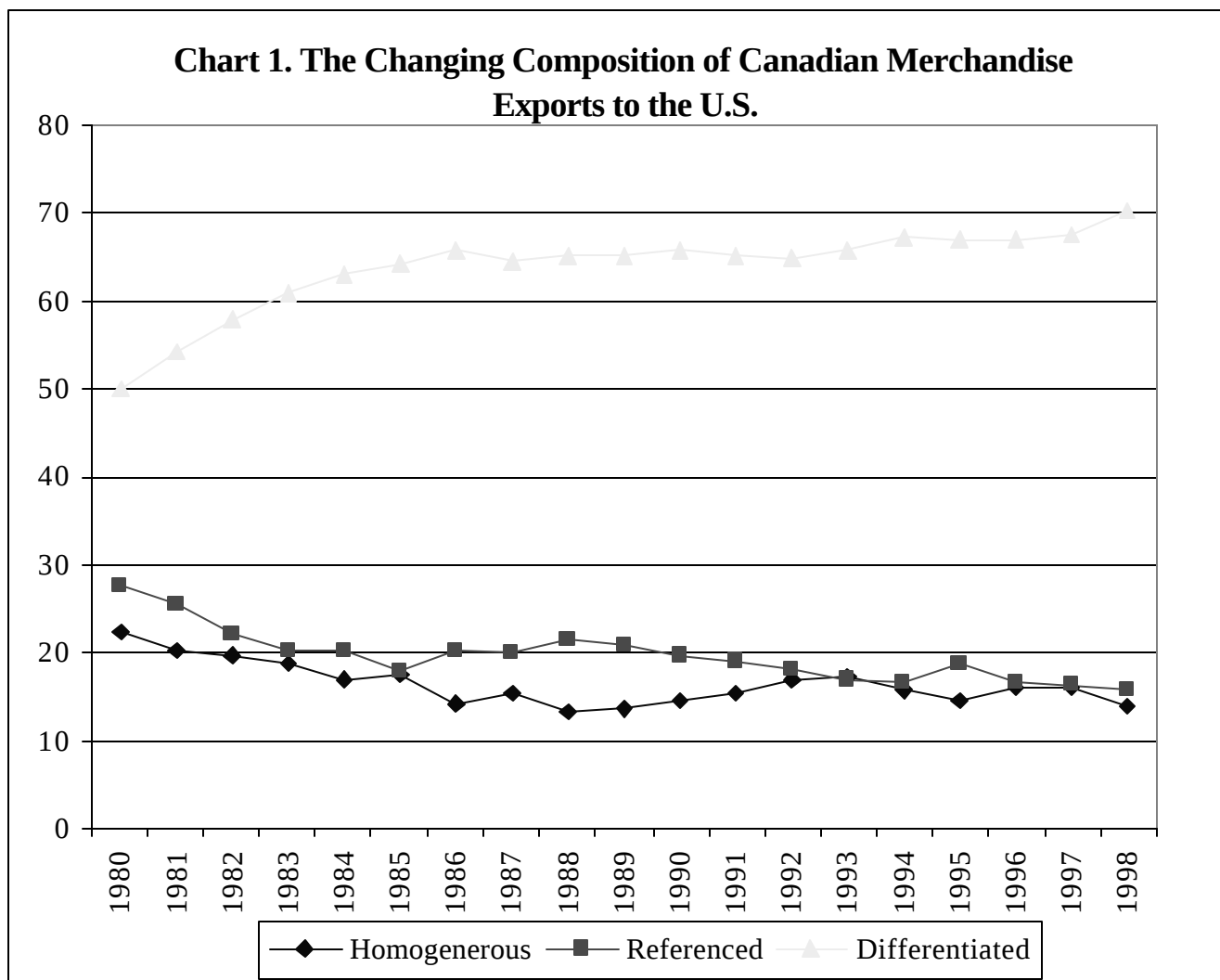
Estimation results

- The estimated coefficients for both source- and target-country GDP are significant and positive. The size of the economy matters.
- Source-country per capita GDP has a significant and positive effect on registrations, but per capita GDP for target country is negatively correlated with registrations
- Distance, language, and regional trade arrangements.
- The source country effect: The U.S., Germany, France, the U.K., Switzerland and Italy have a relatively high propensity to export their varieties; while India, China, and Mexico have fewer varieties available
- The target country effect: The U.S., Australia, China, and the U.K. are relatively open to foreign varieties, while India and Brazil are relatively restrictive to foreign varieties.

The variety gains under the CANUSFTA

- The advantages of using Canada and U.S. trademark data are twofold:
 - These two countries have better-quality trademark registration statistics, and they have very similar trademark registration and enforcement systems
 - By focusing on these two countries' registrations statistics, one could further isolate the trade liberalization effect by removing the language and distance effects from the regression analysis, as these two countries share the same border, culture, and language

Changes in Canada's merchandise trade pattern



The Annual Average Trademark Registrations by U.S. Residents in Canada and Canada's Imports from the U.S. by Product, 1980-02

	1980-89	90-02	Change	Growth (%)	Imports (Can\$ Billion) (90-02)	The Number of Trademark per Billion of Imports
Homogeneous Products	185	246	61	33.5	10	25
Referenced Products	974	1555	581	59.7	9.8	158
Differentiated Product	4342	7018	2676	61.6	72.5	97
Differentiated Product without Auto Products	4041	6550	2509	62.1	51.9	126
Goods	5501	8820	3319	60.3	92.3	96
Services	930	2402	1472	158.4	31.5	76
Total	6431	11222	4791	74.5	123.8	90.6

The Annual Average Trademark Registrations by Canadian Residents in the U.S. and the U.S. Imports from Canada by Product, 1980-01

	1980-89	90-01	Change	Growth (%)	Imports (U.S\$ Billion)	The number of trademark per billion of imports
Homogeneous Products	48	94	46	97.2	17.3	5.4
Referenced Products	210	526	316	151	16.5	31.9
Differentiated Product	864	2296	1432	165.6	60.3	38.1
Differentiated Product without Auto Products	804	2142	1338	166.5	38.8	55.2
Goods	1122	2916	1794	166.5	94	31
Services	265	902	637	240.6	13.2	68.3
Total	1387	3818	2431	175.3	107.2	35.6

The variety gains under the CANUSFTA

- Access to different varieties of differentiated products following upon trade liberalization was the focal point under the CANUSFTA
- Canada's access to U.S. varieties was almost three times more than what the U.S. obtained from Canada. During the 1990s, the average annual trademark registrations by U.S. residents in Canada amounted to 11,222, compared to 3,818 by Canadian residents in the U.S.
- This pattern was particularly pronounced in the case of differentiated products. Canada obtained 126 varieties for every billion dollars of imports of differentiated products from the U.S.; on the other hand, Canada provided only 38 varieties in every billion dollars of exports of differentiated products to the U.S.
- Smaller countries gain more from trade liberalization and economic integration

What industries Canada has gained the most

- Industries that experienced the most rapid technology changes such as computer and electronic products, chemical products, and machinery
- Industries in which many new ideas, new concepts, and new products proliferated such as food, apparel, and toilet preparation products that were subject to heavy advertisements

The Annual Average Registrations of Trademarks by U.S. Residents in Canada, 1980-02

NAICS	Industries	1980-89	1990-02	Growth (%)
334	Computer & Elec. Products	463	981	111.8
339	Miscellaneous Manu.	587	868	47.8
325	Chemical Products	641	864	34.7
311	Food	364	572	57.2
333	Machinery	392	571	45.6
332	Fabricated Metal Product	391	571	46.0
323	Printing	275	561	103.8
336	Transportation Equipment	301	469	55.5
315	Apparel	282	465	64.9
326	Plastics & Rubber Products	288	444	54.5

The estimated effects of Canadian tariff reductions on U.S. trademark registrations in Canada by product

	Total imports	Differentiated products	Referenced products
Tariffs	-0.0601	-0.1023	-0.0307
Apparel	0.7751	0.7014	
Chemical	1.2661		
Computer	1.276	1.0613	
Electrical prods & appliance	0.5363		
Fabricated metal	0.8367		
Food	0.8726	0.7104	
Plastics	0.6111		
Printing	0.7788	0.5991	
Textile products	-0.2955		0.1721
Transportation	0.5407		
90	-0.2451	-0.1153*	-0.315
N	311	198	86
Adjusted R-square	0.5325	0.3968	0.8936

The estimated effects of U.S. tariff reductions on Canadian trademark registrations in the U.S. by product

	Total imports	Differentiated products	Referenced products
Tariffs	-0.0765	-0.1018	-0.0417
Apparel	0.8363	0.9496	
Chemical	0.9391		
Computer	1.508	1.5497	
Electrical prods & appliance	0.552	0.6236	
Fabricated metal	0.9163	0.9823	
Food	0.9423	1.0081	
Machinery	0.8249		
Plastics			
Printing	0.6023	0.6044	
Textile products			0.1951
Transportation			
90	-0.2309*	-0.1836**	-0.2542*
N	273	171	78
Adjusted R-square	0.5085	0.7425	0.844

Conclusions

- Nations are trading far fewer varieties than commonly supposed, and there is strong “home bias’ in the global production and consumption of differentiated products. This even after taking account of languages, distance, and regional preferential trade arrangements that are commonly seen as major factors explaining global trade and production pattern
- Trade liberalization has significant variety-enhanced effects to both Canada and the U.S.
- Canada’s access to U.S. varieties was three times more than what the U.S. obtained from Canada.