China-Canada Competition in the U.S. Market

David Boileau

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David Boileau
Current and structural Analysis Division
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Executive summary

With its strong growth in exports, China is becoming increasingly competitive to Canadian exports in third markets. This is specially a concern in Canada's largest export market, the U.S., where China has quickly gained market share while Canada's has decreased. This paper asks the question; is China competition to Canadian merchandise exports to the United States? Using a measurement of revealed comparative advantage shows that China is currently not competition to Canada, since China and Canada specialize in different sectors of exports to the U.S. market. On the other hand, constant market share analysis, which looks at the change in market share, indicates that China is rapidly gaining in sectors where Canada has enjoyed a large share of the U.S. market. Therefore, although China is not currently in direct competition with Canada in the U.S. market, its strong growth in many sectors where Canada has a revealed comparative advantage point to increased competition from China in the future.

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1. Introduction

Over the past few years, China has been growing at a very impressive rate. Since 1990, GDP has grown at an average annual rate of 9.4 per cent[2]. China's exports have been growing even faster, at an annual average growth of 18.1 per cent, over the same period. The emergence of China clearly offers many opportunities for Canada; exports to China have more than doubled over the past decade, from $3.4 billion in 1995 to $7.1 billion in 2005. Nevertheless, in addition to the expanding opportunities that China might offer, it can also pose challenges for Canada. With its dramatic growth in exports, particularly to the U.S., the question arises: is China a threat to Canadian exports?

Although China might offer competition to Canada in many of our export markets, of particular interest is the likely impact of the growth of China's exports to the United States. As most Canadians are aware, the U.S. consumes the majority of Canada's merchandise exports, just under 84 per cent in 2005. Canada has the great advantage of

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[1] This paper has been adapted from its original version published in the "Seventh Annual Report on Canada's State of Trade".

[2] There has been some debate over the accuracy of China's GDP figures. Critics have argued that over some periods the growth in China's GDP has been over or underestimated by official Chinese Statistics. See Rawski (2001), "What's Happening to China's GDP Statistics?" China Economic Review, Vol 12.4.

being next door to the largest consumer market in the world, and with NAFTA Canada has unparalleled access to this large dynamic and growing economy. Canada has been the largest trading partner of the U.S. for the past several decades, but this is likely to change. China's exports to the U.S. are surging, its share of the U.S. import market has sharply increased from 3.1 per cent in 1990 to 14.6 per cent in 2005, not far behind Canada's 17.2 per cent share (See Figure 1). Over the same period, Canada's share increased from 18.5 per cent in 1990 to 19.8 per cent in 1996, but then started a steady decline to 17.2 per cent in 2005. As a possible sign of things to come, for the first time ever in July of 2005 China surpassed Canada to be the largest supplier of U.S. imports for the month. Canada has since regained its lead, but this might not last.

Figure 1. Share of U.S. Import Market
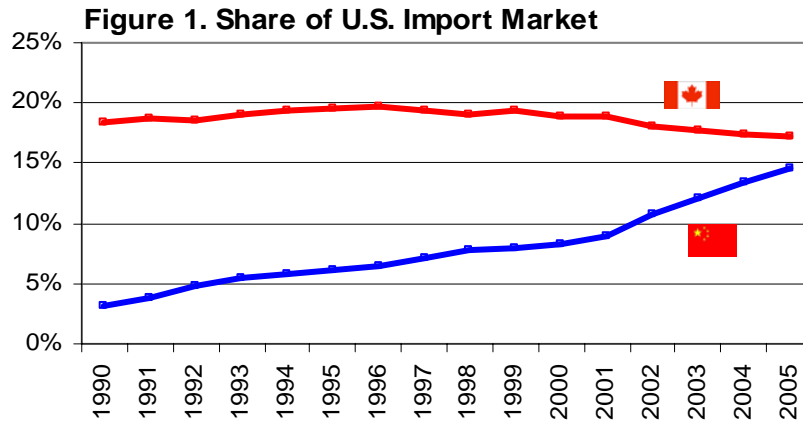
Source: Statistics Canada

Although China's market share in the U.S. has increased while Canada's has decreased, this does not necessarily mean China's gain came at Canada's expense. Trade is not a zero sum game; although Canada's share has been dropping, the total value of Canadian exports to the U.S. is continuing to increase, i.e. Canada has a smaller share of a larger pie. One question is whether Canada's exports would have increased at a greater rate without competition from China? In other words, the surge of Chinese exports to the U.S. squeezing out Canadian exports? A closer look needs to be taken to evaluate the threat of China's rising share of the U.S. market.

2. Revealed comparative advantage (RCA) analysis

One of the basic economic theories explaining why countries trade is the theory of comparative advantage. Simply put, a country will export goods and services in which it has a lower opportunity cost in producing, or put another way, goods it is more efficient at producing than is the case for other countries. On the other hand, a country will import goods and services it has a relative disadvantage in, since it will cost less to import than to produce itself. Therefore China and Canada should export goods and services to the U.S. in which they have a comparative advantage. If China and Canada have the same comparative advantages, they will export the same types of goods and compete for market share. On the other hand, if they have different comparative advantages, they will export different products and not be in direct competition. To see if China and Canada share the same comparative advantages, one can look at revealed comparative advantage (RCA). This method looks at the composition of trade between countries to reveal areas of specialization and hence their comparative advantage. One measure of this is the

Balassa index which measures "the ratio of the share of a given product in a country's exports to another country or region to the share of the same product in that country or region's total exports"[3]. More specifically:

$$BI(EX) = \frac{x_{ij}^{k} / X_{ij}}{x^{k} / X}$$

Where x_{ij}^{k} is exports of good k from country i to country j, X_{ij} is total exports of country i to country j, x^{k} is exports of good k by the reference region or country (in this case the U.S.) and X is total exports of the reference country. If the index BI(EX) is greater than one, the country is said to have a comparative advantage in exports of that good. This index can be calculated for Canada and China at the 2HS level[4] to reveal which sectors each country has a comparative advantage in regards to exporting to the U.S. market.

Tables 1, 2 and 3 show the sectors in which Canada and China have a RCA with respect to the U.S. (average BI(EX) for the past five years). Of the 96 HS 2 product codes, Canada has a RCA in 35, of these 35; 15 are sectors where China also has a RCA. Canada exhibits the largest RCAs mainly in resource areas, whereas China has the largest RCAs in mainly textiles and low skilled manufacturing. Overall the RCAs for China and Canada are not positively correlated; this would indicate that China and Canada are not competitors in the U.S. market.

Although the theory of comparative advantage might tell us that China is not a direct competitor to Canada in the U.S. market, this theory might not completely explain all the realties of international trade. Often countries trade in goods that do not correspond to their comparative advantages. For instance a significant portion of Canada-US trade is intra industry, which could be explained by other factors.

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[3] Widgren (2005), "Revealed comparative advantage in the internal market", Turku School of Economics, the Research Institute of the Finnish economy, 2005.

[4] Refers to the international "Harmonized System" of commodity classification. The 2HS level breaks up commodities into approximately 99 categories based on type of product.

Table 1. Sectors in which Canada and China both exhibit a RCA with the U.S.

HS	Description	Canada RCA	China RCA
79	Zinc and articles thereof	17.67	6.06
44	Wood	6.30	1.09
78	Lead	3.55	1.56
94	Furniture and bedding	2.76	7.07
53	Other vegetable textile fibre	2.41	7.74
03	Fish and seafood	1.93	1.67
86	Railway and traffic signal equipment	1.87	3.93
43	Fur skin and artificial fur	1.51	1.70
16	Prepared meat, fish, etc	1.48	2.25
65	Headgear	1.45	15.30
66	Umbrellas, walking sticks, etc	1.42	120.75
25	Salt, sulfur, earth, stone, etc	1.42	2.14
73	Iron and steel products	1.28	2.41
51	Animal hair, yarn and fabric	1.13	1.04
83	Miscellaneous art of base metal	1.09	2.29

Table 2. Sectors in which Canada exhibits a RCA with the U.S. but China does not

HS	Description	Canada RCA
27	Mineral fuel, oil, etc	7.56
01	Live animals	6.06
06	Live trees and plants	3.18
48	Paper and paperboard	2.95
76	Aluminium	2.86
75	Nickel and articles thereof	2.84
87	Vehicles (except railway) and parts	2.75
18	Cocoa	2.57
19	Baking related	2.18
17	Sugars	1.87
47	Wood pulp, etc	1.86
68	Stone, plaster, cement, etc	1.80
74	Copper and article thereof	1.76
72	Iron and steel	1.61
22	Beverages	1.58
31	Fertilizers	1.53
40	Rubber	1.22
89	Ships and boats	1.09
11	Milling products	1.08
26	Ores, slag and ash	1.03

Table 3. Sectors in which China exhibits a RCA with the U.S. but Canada does not

HS	Description	China RCA
67	Feathers, down, artificial flowers, etc	126.24
64	Footwear	77.92
46	Straw, esparto, etc	70.70
42	Leather art, etc	37.24
95	Toys and sports equipment	14.28
62	Woven apparel	10.82
63	Miscellaneous textile articles	10.46
91	Clocks and watches	10.04
50	Silk, silk yarn and fabric	9.79
69	Ceramic products	7.28
61	Knit apparel	5.16
92	Musical instruments	4.44
96	Miscellaneous manufactures	4.18
05	Products of animal origin	4.17
57	Textile floor coverings	3.82
36	Explosives	2.95
82	Tools, cutlery, etc	2.75
80	Tin and articles thereof	2.50
81	Base metals	1.51
14	Other vegetable products	1.23
85	Electrical machinery	1.15
09	Spices, coffee, and tea	1.14
70	Glass and glassware	1.11
13	Vegetable saps and extracts	1.07
20	Preserved food	1.01

3. Constant market share analysis (CMSA)

An alternative method for analyzing China's threat to Canadian exports is the use of constant market share analysis (CMSA). This type of analysis decomposes the growth of Canadian exports to the U.S. into two effects, a share effect (which assumes Canada keeps a constant share of the U.S. market) and a competitiveness effect (allowing for changing market share). This competitive effect can then be split into two; the change in market share relative to China and the change relative to the rest of the world[5]. Mathematically this is shown in the following equation[6]:

$$\Delta X_{ij} = \Delta Qi \cdot S_{ij} + S_{ij} \cdot Q_i * (\Delta S_{ij} / S_{ij} - \Delta S_{ik} / S_{ik}) + \Delta S_{ik} / S_{ik} \cdot S_{ij} \cdot Q_i$$

Where Δ is absolute change, X_{ij} is exports of good i by country j (in this case Canada's exports to the U.S.), Q_i is total imports of good i (by the U.S.) at the beginning of the period, S_{ij} is the initial market share of country j (Canada) and S_{ik} the initial market share of the competitor (China) in U.S. imports of good i. For a more thorough discussion on this version of CMSA, see Holst and Weiss (2004).

Applying the constant market share analysis to U.S. imports of Canadian goods, for the period of 1995 -2005 reveals that Canada has experienced a high degree of competition from China in almost all areas of the U.S. market. Table 4 decomposes U.S. imports into 12 main categories[7] in absolute terms the U.S. has increased imports from Canada in all categories, (the largest increase was in oil, which increased $60 billion over the past decade).

The 3rd column, titled constant market share effect, shows the value of Canadian exports if Canada had retained its initial 1995 market share (shown in dollar terms and as a percentage of the actual increase). Machinery and motor vehicles exhibit the largest constant market share effect; if Canada had kept its initial market share in these categories, the increase in U.S. imports would have been more than double the actual increase experienced. Overall competitiveness (the sum of the second and third term in the above equation) gives the effect of Canada's competitiveness relative to the rest of the imports in the U.S. market. In categories where Canada has lost market share, this is a negative effect. Machinery and motor vehicles again show the largest effect. The final column gives the measure of Canada's competitiveness relative to China (second term of the equation), in all categories except oil, Canada shows a strong effect from the loss of market share relative to China. For example, China has made the largest gains in machinery, electrical and motor vehicles in the U.S. market. Canada's loss of

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[5] Holst and Weiss (2004), ASEAN and China: Export rivals or partners? The World Economy, Vol. 27, No. 8, August 2004.

[6] Holst and Weiss (2004), ibidem.

[7] Agriculture, food and beverages: HS 01-24, Ores and Metals: HS 25,26,68-81, Oil: HS 27, Chemicals: HS 28-38, Plastic and Rubber: HS 38-40, Wood and Paper: HS 41-49, Clothing and Textiles: HS 50-67, Machinery: HS 84, Electrical: HS 85, Motor Vehicles: HS 87, Other Transport: HS 86,88,89, Misc Manufacturers: HS 82,83,90-98

competitiveness relative to China is many times greater than its overall increase in these categories.

Table 4: Canadian Export Competitiveness in the U.S. Market

Category	Increase in U.S. Imports from Canada 1995-2005	Constant Market share effect		Overall Competitiveness		Competitiveness viz. China	
	millions $CAD	millions $CAD	% of increase	millions $CAD	% of increase	millions $CAD	% of increase
Agriculture, Food & Beverages	8,288	7,082	85	1,206	15	-18,188	-219
Ores and Metals	9,544	18,173	190	-8,630	-90	-93,153	-976
Oil	60,540	61,098	101	-558	-1	41,994	69
Chemicals	8,077	13,747	170	-5,669	-70	-19,417	-240
Plastic & Rubber	8,731	7,799	89	932	11	-15,947	-183
Wood And Paper	6,893	13,316	193	-6,423	-93	-53,505	-776
Clothing and Textiles	1,384	1,825	132	-441	-32	-3,202	-231
Machinery	5,514	11,090	201	-5,576	-101	-211,860	-3842
Electrical	3,607	5,728	159	-2,122	-59	-43,320	-1201
Motor Vehicles	18,837	40,243	214	-21,405	-114	-338,927	-1799
Other Transport	4,394	4,351	99	43	1	-17,319	-394
Misc Manufactures	13,297	17,500	132	-4,203	-32	-35,679	-268
Total	**149,106**	**195,618**	**131**	**-46,512**	**-31**	**-591,270**	**-397**

The constant market share analysis of total U.S. imports of Canadian goods shows a constant market effect of 131 per cent, i.e. the increase in U.S. imports would have been 30 per cent greater if Canada had maintained its initial market share. Overall, the absolute change in relative market share of Canada vis-à-vis China is four times the actual value of the increase in U.S. imports from Canada.
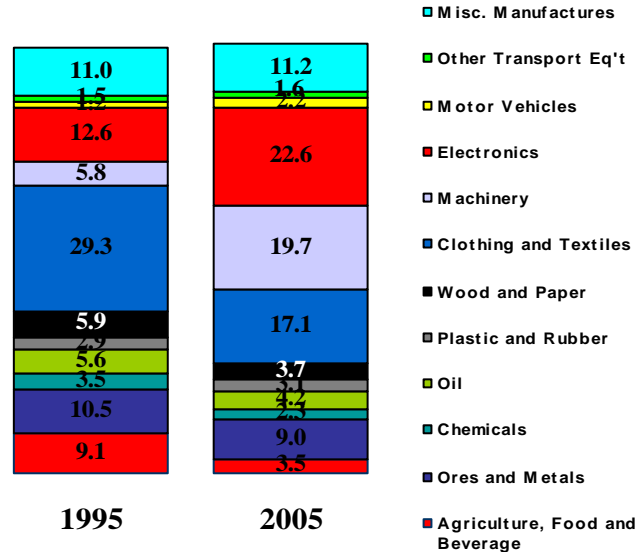
4. Conclusion

In summary, revealed comparative advantage suggests that China is not a competitor to Canada in the U.S. market place since China's strengths are not in the same sectors as Canada. Using constant market share analysis to decompose the effects on growth of Canadian imports in the U.S., however, suggests that Canada is facing competition from China, especially in machinery, electrical and motor vehicles. This is an important distinction because the RCA measure identifies areas where China and Canada currently have strengths in the U.S. market, whereas it could be argued that the constant market share analysis is more forward looking. For example, although China might not currently have a large amount of automotive exports to the U.S., its share is increasing dramatically (from 0.4 per cent in 95 to 2.1 per cent in 2005) and thus will increasingly pose a threat to Canada in this section of the U.S. market. Currently, RCA analysis reveals that Canada has a comparative advantage in automotive exports to the U.S. while China does not. If China continues its growth in this area, however, the constant market share analysis suggests that China might one day be a significant competitor.

This possible outcome can be seen in the quickly changing composition of China's exports (see Figure 2). China is evolving from an exporter of low cost, labour intensive, manufacturing to more high-tech, capital intensive sectors. A recent paper by Dani Rodrik (2006) identifies China as having a much more sophisticated basket of exports than would be normally expected for a country of its income level[8].

As China's exports continue to become more sophisticated, Canada will feel increased pressure from China's growing export competitiveness. If Canada does not adjust to the competitive reality of China, we will not be making the most of the opportunity of being next door to the largest market in the world.

Figure 2. China's Exports to the World (Share of Total)

	1995	2005
Misc. Manufactures	11.0	11.2
Other Transport Eq't	1.5	1.6
Motor Vehicles		2.2
Electronics	12.6	22.6
Machinery	5.8	19.7
Clothing and Textiles	29.3	17.1
Wood and Paper	5.9	3.7
Plastic and Rubber	5.6	4.2
Oil	3.5	
Chemicals	10.5	9.0
Ores and Metals	9.1	3.5
Agriculture, Food and Beverage		

Source: Statistics Canada

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[8] Rodrik, Dani (2006), "What's so special about China's exports?" NBER Working Paper Series, working paper 11947.

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