

Effects of Consumer Sophistication on Export Competition between Korea and China^{*}

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This paper investigates the effects of importing country's consumer sophistication on the export competition between Korea and China. This concept is rarely applied to examine trade pattern of a country at the international level. It is believed that Korea has experienced a negative impact from expansion of Chinese export as Korea competes with China in many ways. However, this study shows that China's impact on Korean export is small or negligible in countries whose consumers are sophisticated. Empirical evidences demonstrate that the most affected Korean exports are labor intensive products, low skill and technology intensive products, and medium skill and technology intensive products. In case of high skill and technology intensive products, the impact of China's export expansion is not significant.

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1. INTRODUCTION

Since China joined the WTO in 2001, its export expansion has negatively affected its export competitors.¹⁾ Korea has also been influenced to a great extent. For example, Korea's market share in the U.S. for low skill and technology intensive industry shrank from 3.9% to 3.3% between 2001 and 2006 while Chinese market share increased from 9.6% to 20.1%. Kim (2006) shows that Chinese impact on Mexican exports to the U.S., despite Mexico's membership in NAFTA, has been devastating especially after China actively exported to the world market. His idea is based on the argument that Mexico has been adversely affected by the expansion of China's exports as it has very similar export structure to China. Lall *et al.* (2005) also share this view. They contend that the more similar export structure it is to China, the more damages are caused to the export.

However, China's negative impact on a country's exports can be dampened by upgrading quality of export over that of China. Lall and Albaladejo (2004) state that the threat of China's export on the East Asian countries is the largest in low technology products and it is growing for medium and high technology products. Only countries keeping a technological edge over China can overcome their wage disadvantage. Nevertheless, the high competitiveness in export quality against China might be useless without importers' preferences for better quality. Accordingly, this paper intends to investigate the export competition between Korea and China from the demand side which is a fresh approach dealing with trade issues. In other words, it illuminates the effects of importing country's consumer sophistication level on the export competition between Korea and China.

The structure of the paper is as follows: the paper scrutinizes the export competition of Korea and China in section 2, and proposes a measure regarding a level of consumer sophistication and theoretical framework in

¹⁾ This study focuses on the negative effects of China's export expansion on its export competitors although Kim *et al.* (2004) and Yoon and Yeo (2007) argue that there are complementary effects by the growth of China's imports from those competitors as well as the negative impacts.

section 3. In section 4, some empirical evidences relating to the effects of importing country's consumer sophistication on the export competition between Korea and China are provided, and finally in section 5, a brief conclusion is offered.

2. EXPORT COMPETITION BETWEEN KOREA AND CHINA

If an export competition between Korea and China in the third markets is strong for labor intensive and low skill products, it is expected that Korea would lose its export share on account of China's extraordinary competitiveness in the corresponding goods. To identify this phenomenon, correlation coefficients between the change of Korea's export share in the third markets (ΔK) and the change of China's export market share (ΔC) are estimated. Also, correlation coefficients between ΔK and the export competition between Korea and China are calculated. To measure a level of the export competition between Korea and China, this paper adopts the Export Similarity Index (ESI), first used by Finger and Kreinin (1979).²⁾ In table 1, the ΔK and ΔC are derived from the change between 2000 and 2005, and the ESI between Korea and China in the same market is the average of values in 2000 and 2005.³⁾ In addition, the correlation coefficients are presented by a group of products categorized by technology and skill intensities. According to table 1, the coefficients between the ΔK and ESI are negatively significant at 1% level for labor intensive and resource based manufactures (B) and low skill and technology intensive

²⁾ It measures a level of the competition between country a and country b in country c , and is computed as follows: $ESI(ab, c) = \sum \text{Min}\{X_i(ac), X_i(bc)\}$, where $X_i(ac)$ is the share of the product i in the exports of country a to country c , and $X_i(bc)$ is the share of the product i in the exports of country b to country c .

³⁾ The ΔK , ΔC , and ESI were calculated with data downloaded from the UNCOMTRADE. In the calculation of the ESI, we used values based on the SITC Revision 3 at 3 digit level of aggregation.

Table 1 Correlation Coefficient between ΔK and ΔC , and ESI

	A	B	C	D	E
ΔK and ΔC	0.144	-0.044	-0.374***	-0.122	-0.044
	(50)	(50)	(50)	(50)	(50)
ΔK and ESI	0.205	-0.648***	-0.359***	-0.107	0.229
	(50)	(50)	(50)	(50)	(50)

Notes: *** denotes significance at 1% level. () is the number of observation and its unit is an export destination for Korea and China. The UNCTAD divides all products into 5 categories by technology classification. "A" are primary commodities; "B" are labor intensive and resource based manufactures; "C" are manufactures with low skill and technology intensity; "D" are manufactures with medium skill and technology intensity; "E" are manufactures with high skill and technology intensity.⁴⁾

manufactures (C). Furthermore, the coefficient between the ΔK and ΔC is negatively significant at the same level only for low skill and technology intensive manufactures (C).

3. CONSUMER SOPHISTICATION AND COMPETITION

Korea's export share in Kenya for low skill and technology intensive manufactures decreased by 4.8% between 2000 and 2005 while China's share increased by 3%. This may reflect a strong negative effect of China's export expansion on Korea's exports. However, this phenomenon does not happen in Switzerland. Korea's export share in Switzerland for the same products went up by 0.5% between 2000 and 2005. In addition, China's share did not show significant increase as much as in Kenya. Then, why are the effects of China's export expansion on Korea's exports so different depending on the market? This paper suggests that the concept of importing country's consumer sophistication may be the determinant variable.

Sproles *et al.* (1978) conceptualized the consumer sophistication as an individual's aggregated level of acquired knowledge, experience in purchasing

⁴⁾ See UNCTAD (2002).

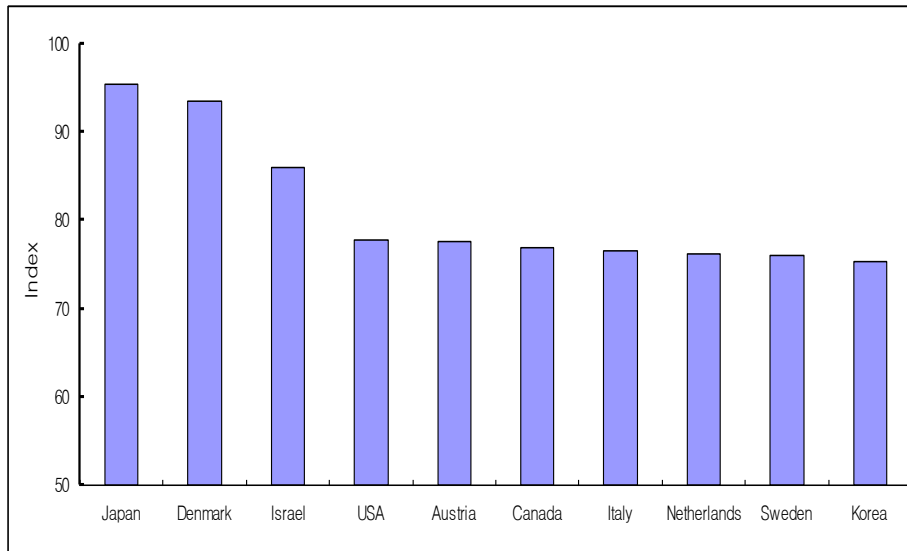
Table 2 Components for Consumer Sophistication

Components	Meaning
Information	How much does consumer know about product?
Quality	How much is consumer sensitive to product's quality?
Brand	How much is consumer sensitive to company's brand?
Design	How much is consumer sensitive to product's design?
New Product	How strong is consumer's preference for new product?
Health & Environmental Issue	How much is consumer sensitive to health & environmental when selecting products?
Intellectual Property Right	How much is consumer reluctant to accept illegally copied products?

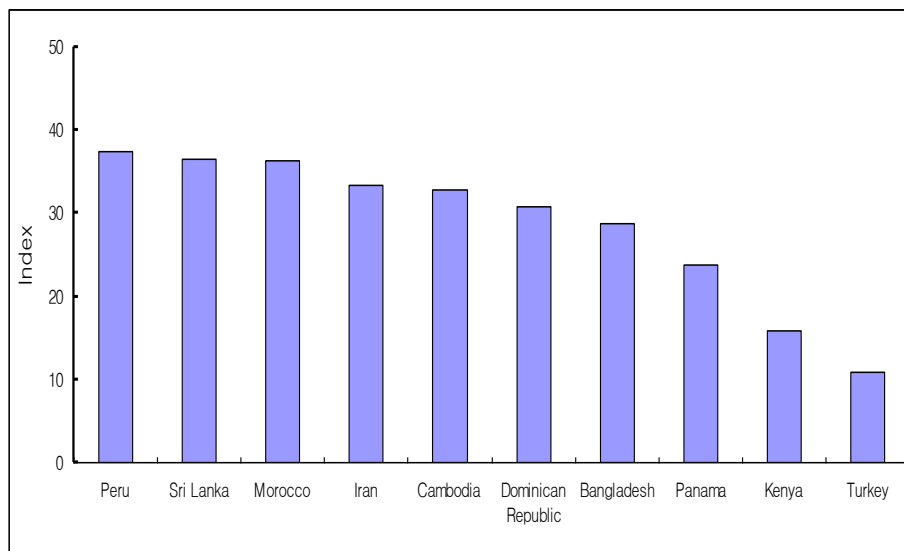
Source: IPS National Competitiveness Research Report.

products, and skills which are relevant to being an efficient decision-maker. The factors used for measuring it are general educational level, number of consumer education courses completed, awareness of brand names, past experiences in purchasing products, self-perceived knowledgeable in evaluating product quality, and self-confidence in choosing quality products. In addition, Barnes and McTavish (1983) described it as those possessing certain characteristics such as more experience and higher education. Recently, the Institute for Industrial Policy and Studies (IPS) has been mentioning it through the National Competitiveness Research Report.⁵⁾ It has several components as shown in table 2. For the purpose of our analysis, the definition by the IPS is adopted. The ideas introduced by Sproles *et al.* (1978) and Barnes and McTavish (1983) were limited to some cases and out of date. In contrast, the IPS offers the newest data for the consumers of 66

⁵⁾ The Institute for Industrial Policy and Studies, which was established under the auspices of Korean government in 1993, publishes the report annually. The report is similar to the Global Competitiveness report published by the World Economic Forum.

Figure 1A Top 10 Countries in the Consumer Sophistication Index (2005)

Source: IPS National Competitiveness Research 2006 Report.

Figure 1B Bottom 10 Countries in the Consumer Sophistication Index (2005)

Source: IPS National Competitiveness Research 2006 Report.

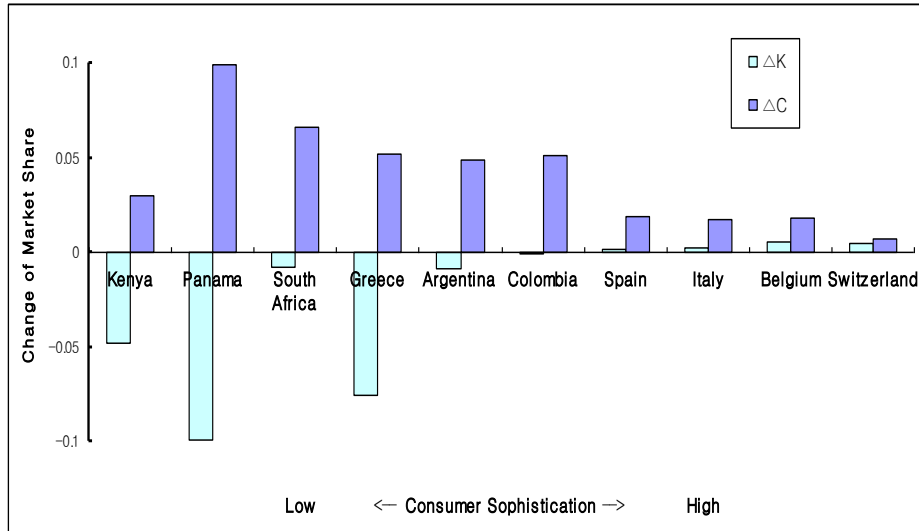
countries, and includes factors relating to environment and Intellectual property right, which are becoming more important with globalization. Figure 1A and 1B show the top 10 and bottom 10 countries, respectively, with respect to the consumer sophistication index of 2005.

Previous researches claim that the more sophisticated the consumers are, the more likely they are to select products with high quality rather than low price. Lambert (1972) found that those who selected the low-priced items have relatively low ability to judge product quality. In addition, he concluded that brand choice has relatively little social meaning to them. In other words, the consumers with a low level of sophistication are more easily persuaded by lower price. Townsend (1991) stated that many new products take off in the west of the U.S. as western consumers in the U.S. are open to novelty and change. Furthermore, she found that they care about not only nutritional contents of their purchases but also the quality and brand of those products as they are sophisticated. As for environmental issues, Bjørner *et al.* (2004) prove that Danish consumers are willing to select the products with environmental labels rather than those without the labels when they purchase toilet paper and detergent as they are sophisticated regarding environmental issues. In terms of the consumer sophistication index related to health and environment in 2005, Danish consumers have the highest score.

Figure 2 shows how Korean and Chinese export market shares for goods in group C changed between 2000 and 2005 in selected countries with different levels of consumer sophistication. Korean export market share shrank as Chinese share increased in countries with a low level of consumer sophistication. However, in countries with a high level of consumer sophistication, Chinese share could not increase much and the negative impact on Korean share disappeared.

The theoretical framework for investigating the effects of the consumer sophistication on the export competition between Korea and China as shown in figure 2 is based on the argument adopted by Hallak (2006): rich countries tend to import relatively more from countries that produce high quality goods. He used importer's GDP per capita as a proxy for its preference for export

Figure 2 Change of Korean and Chinese Export Market Shares for “C” Goods (2000-2005)



Source: The authors' own estimation from the UNCOMTRADE dataset.

quality. Therefore, his study originally implies that a country with high preference for export quality imports relatively more from countries that produce high quality goods. According to Weder (1996), importer's preference for export quality can be regarded as importing country's consumer consumer sophistication. He stated that the different preference for product quality is described as a sophistication of domestic demand. Thus, it is logical that countries whose consumers are more sophisticated import Korea's products more than those of China as long as the quality of the former is higher than that of the latter.

4. EMPIRICAL ANALYSIS

Although the concept of consumer sophistication is frequently applied to analyze consumer behavior for some specific products and consumers in the field of the business administration, it is rarely applied to the international

level to examine trade pattern of a country. Thus, this study intends to analyze the impact of importing country's consumer sophistication on the export competition between Korea and China.

To apply the concept of consumer sophistication to the export competition between Korea and China, it is assumed that Korea's exports are of higher quality than those of China. Schott (2008) stress that the OECD countries move towards the production of more sophisticated goods as increased trade with China may cause them to abandon the production of less-sophisticated goods. His reason is that China has comparative advantage in exports based on lower wage while the OECD countries specialize in more sophisticated varieties. Bernard *et al.* (2006) also find that the U.S. manufacturing plants facing higher shares of imports from low wage countries are more likely to jump towards industries consistent with the U.S. comparative advantage that are more capital or skill intensive. Accordingly, it is logical to assume that exports of Korea, which is one of the OECD members, are of higher quality than those of China.

If more sophisticated consumers tend to consume based on quality rather than price and that Korea's exports are of higher quality than those of China, it is expected that China's export expansion would have a strong impact on Korea's exports only in countries with a low level of consumer sophistication. On the contrary, this would be not the case in countries with a high level of consumer sophistication as their consumers are indifferent to the price. In order to verify whether this is true, the regression showing the relations is presented in table 3-4.

The data of consumer sophistication are taken from the IPS National Competitiveness Research 2003-2006 Report. The value we used is the average between 2003 and 2005. Since the data in 2000-2002 do not include all the components regarding the consumer sophistication index, the data in 2003 is employed. The consumer sophistication indices are available for 66 countries. However, the data of 50 countries are used for this research due to the data discrepancy between the UNCOMTRADE and the IPS National Competitiveness Report. Although the data do not include all countries in

Table 3 Regression Results Including CS* ΔC

	A	B	C	D	E
Constant	-0.000091	0.079 ^{***}	0.010 ^{**}	0.009	-0.003
	(-0.17)	(3.43)	(2.13)	(1.34)	(-0.45)
ΔC	0.128	-0.221 ^{**}	-0.468 ^{***}	-0.199 ^{**}	-0.146
	(1.32)	(-1.98)	(-6.79)	(-2.52)	(-1.19)
ESI	0.059	-2.336 ^{***}	-0.280 ^{***}	-0.075	0.053
	(1.36)	(-6.30)	(-3.63)	(-0.99)	(1.56)
CS* ΔC	-0.001	0.007	0.007 ^{***}	0.003 ^{**}	0.001
	(-1.24)	(1.95)	(5.63)	(2.45)	(0.86)
R^2	0.079	0.467	0.566	0.140	0.085
N	50	50	50	50	50

Notes: ^{**} denotes significance at 5% level and ^{***} denotes significance at 1% level. () is t -value and the unit of observation is an export destination for Korea and China.

the world, they include the data of significant countries for this research.

Table 3 shows the regression results including the interaction term between the variables regarding the consumer sophistication (CS) and the increase of Chinese export share (ΔC). It is observed that the coefficients of the CS* ΔC are positive and significant at 1-5% level for the product category C and D while those of ΔC are negative and significant at the same level. The product category B also follows the trend although the coefficient of the CS* ΔC is marginally significant. This means that the expansion of Chinese exports has a strong negative impact on Korean exports in countries with a low level of consumer sophistication whereas the negative impact is negligible in countries with a high level of consumer sophistication. In other words, Chinese exports with lower price are not substitutable with Korean exports with better quality as the consumers care more about quality than price.

Table 4 Regression Results Including CS*ESI

	A	B	C	D	E
Constant	-0.001	0.062***	0.016***	0.006	-0.002
	(-1.22)	(2.69)	(2.68)	(0.91)	(v0.43)
ΔC	0.016	-0.001	-0.132**	-0.032	-0.076
	(1.02)	(-0.01)	(-2.43)	(-0.65)	(-1.38)
ESI	0.548***	-3.316***	-0.992**	-0.196	-0.050
	(4.65)	(-6.58)	(-2.65)	(-1.89)	(-0.75)
CS*ESI	-0.006***	0.026***	0.010**	0.003	0.002
	(-4.44)	(3.06)	(1.96)	(1.92)	(1.90)
R^2	0.334	0.490	0.323	0.100	0.138
N	50	50	50	50	50

Notes: ** denotes significance at 5% level and *** denotes significance at 1% level. () is t -value and the unit of observation is an export destination for Korea and China.

Table 4 shows the regression results including the interaction term between the variables regarding the consumer sophistication (CS) and the Export Similarity Index (ESI). The coefficients of the ESI are negative for most of the cases whereas those of the $CS*ESI$ are positive and significant at 1-5% level for the product category B and C. When Korea competes with China in the same export markets, the former may be driven out by the latter. This phenomenon, however, appears only in countries with a low level of consumer sophistication. In countries with a high level of consumer sophistication, the negative effect is much weaker, implying that consumers distinguish products based on quality.

However, in case of high skill and technology intensive products, there are no significant effects of China's export expansion, export similarity between Korea and China, and of importing country's consumer sophistication on Korea's exports. The possible explanation for this result is that Korea's

competitiveness regarding these products is so strong compared to China that Korea's exports are not affected by those of China.

5. CONCLUSION

China's export expansion has affected many countries and Korea is not an exception. Korea has experienced a negative impact, especially in markets where it competes with China. However, this study shows that the negative impact is small or negligible in countries whose consumers are sophisticated. In other words, the evidences from the export competition between Korea and China for those sectors support this paper's hypothesis that the more sophisticated consumers are, the more they import high quality products. On the basis of empirical evidences, this phenomenon is also limited to labor intensive products, low skill and technology intensive products, and medium skill and technology intensive products. In case of high skill and technology intensive products the impact of China's export expansion is not significant.

This research also leaves a room for further study. This paper has inferred through existing literatures that Korea's exports are of a higher quality than those of China. However, the export quality can be numerically calculated and the effects of the quality gap can also be empirically analyzed.

APPENDIX

Table A1 Summary of Variables

Classification	Variable	Obs.	Mean	Std. Dev.	Min	Max
A	ΔK	50	0.001	0.003	-0.006	0.009
	ΔC	50	0.011	0.022	-0.006	0.150
	ESI	50	0.007	0.010	0.00005	0.057
	CS	50	61.980	20.924	10.415	97.855
	CS* ΔC	50	0.721	1.880	-0.307	13.066
	CS*ESI	50	0.480	0.847	0.002	5.583
B	ΔK	50	-0.030	0.099	-0.692	0.002
	ΔC	50	0.093	0.110	-0.062	0.526
	ESI	50	0.052	0.029	0.016	0.167
	CS	50	61.980	20.924	10.415	97.855
	CS* ΔC	50	5.687	6.356	-3.347	28.210
	CS*ESI	50	3.092	1.754	0.455	8.345
C	ΔK	50	-0.003	0.032	-0.160	0.079
	ΔC	50	0.056	0.075	-0.001	0.436
	ESI	50	0.033	0.041	0.004	0.217
	CS	50	61.980	20.924	10.415	97.855
	CS* ΔC	50	3.251	4.193	-0.059	26.143
	CS*ESI	50	2.191	2.998	0.117	14.852
D	ΔK	50	0.002	0.016	-0.038	0.045
	ΔC	50	0.036	0.045	0.001	0.241
	ESI	50	0.079	0.028	0.028	0.136
	CS	50	61.980	20.924	10.415	97.855
	CS* ΔC	50	2.050	2.844	0.130	17.987
	CS*ESI	50	4.822	2.212	0.737	8.934
E	ΔK	50	0.002	0.020	-0.048	0.066
	ΔC	50	0.053	0.053	-0.008	0.315
	ESI	50	0.140	0.089	0.016	0.384
	CS	50	61.980	20.924	10.415	97.855
	CS* ΔC	50	3.361	4.300	-0.081	27.437
	CS*ESI	50	9.118	7.073	0.374	35.089

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