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The Impact of China's Clothing Exports on South Asian Countries

Abstract

With the remarkable efforts of the government and reform of economy since the open door policy, China has rapidly emerged as a preferred exporter in the global clothing products. In 2007, China's clothing exports to the world amounted to US\$115 billion, which represented 44 % of the world total clothing exports. Since 1995, it has become the world's largest clothing exporter. China's highly elastic supply of low cost labour and the on-going trade liberalization has increased trade adjustments in both developed and developing countries. The dramatic increase of China's clothing export has particularly triggered fears of increased competition for among the developing economies. Its accession to the WTO in 2001 further exuberate such fears. Although spillovers from China's rise have gradually stretched to almost all regions of the world, neighbouring South Asian countries have been more manifested given their close geographical proximity. These are especially true for those at the similar stage of development with relative factor of endowments and production costs. China's abundance of low-cost labour has underscored its comparative advantage in labour intensive clothing products. Hence, low-income South Asian countries in the region feel at risk of being displaced in global market.

This paper uses the gravity modeling to explore whether China's clothing exports is displacing exports of other Asian countries over the period 1990-2006. Aggregate

analysis is conducted and the endogeneity of China's clothing exports are described by using instrumental variables with fixed effects. Results indicated that the displacement effect is more pronounced in low-income South Asian economies than the middle-low counterparts. Therefore, the clothing exports for China's neighbouring countries are being eroded; in particular, the less developed South Asian suppliers are more seriously affected.

Introduction

China has rapidly emerged as a significant global exporter in clothing trade with the support of government policy since 1979. In 2007, China's clothing exports amounted to US\$115 billion, which represented 44% of the world total clothing exports. Since 1995, it has become the world's largest clothing exporter. China's size and its highly elastic supply of low cost labour have increased the industrial adjustment concerns for neighbouring developing countries. The spectacular increase of China's clothing export has particularly created fears of competition for the low-income economies while its accession to the WTO in 2001 further exerted such fearfulness.

Although the consequences from China's growth have gradually spread to almost all regions of the world, neighbouring Asian countries are closely affected, given their geographical proximity. This is especially true for those at the similar stage of development with similar factor endowments and production costs. China's abundance

of low-cost labour stresses its comparative advantage in clothing industry because it is a technologically humble sector with high labour intensity. Therefore, low-income counterparts feel at risk of being displaced in global markets. Unlike most previous studies which adopt a general equilibrium framework based on measures of trade similarity, this paper uses the gravity model to explore whether China's exports have displaced the exports of Asian countries in third markets.

The Changes of Clothing Supply from South Asia

The clothing industry is central to the global economy and has played an especially important role in the export-oriented development of Asia; initially in Hong Kong, South Korea and Taiwan, and more recently, China. This sector has been responsible for creating millions of jobs, increasing income and contributing to economic growth in South Asian countries. Some of these countries, notably India and Pakistan had an inherent competitive edge in this sector and earned considerable foreign exchange.

Global clothing exports amounted to US\$301 billion in 2007. The EU is the world's largest clothing importer. With its enlargement of member countries to 27, EU accounted for about 44% of world clothing imports, surpassing the USA's share by 17% in 2007. The growth of global clothing imports goes hand in hand with the rise of global clothing exports. Controlling the biggest purchasing power, the EU and USA lead buyers have shaped the geography of global clothing supply significantly over the past few decades. The number of significant global clothing exporting countries increased

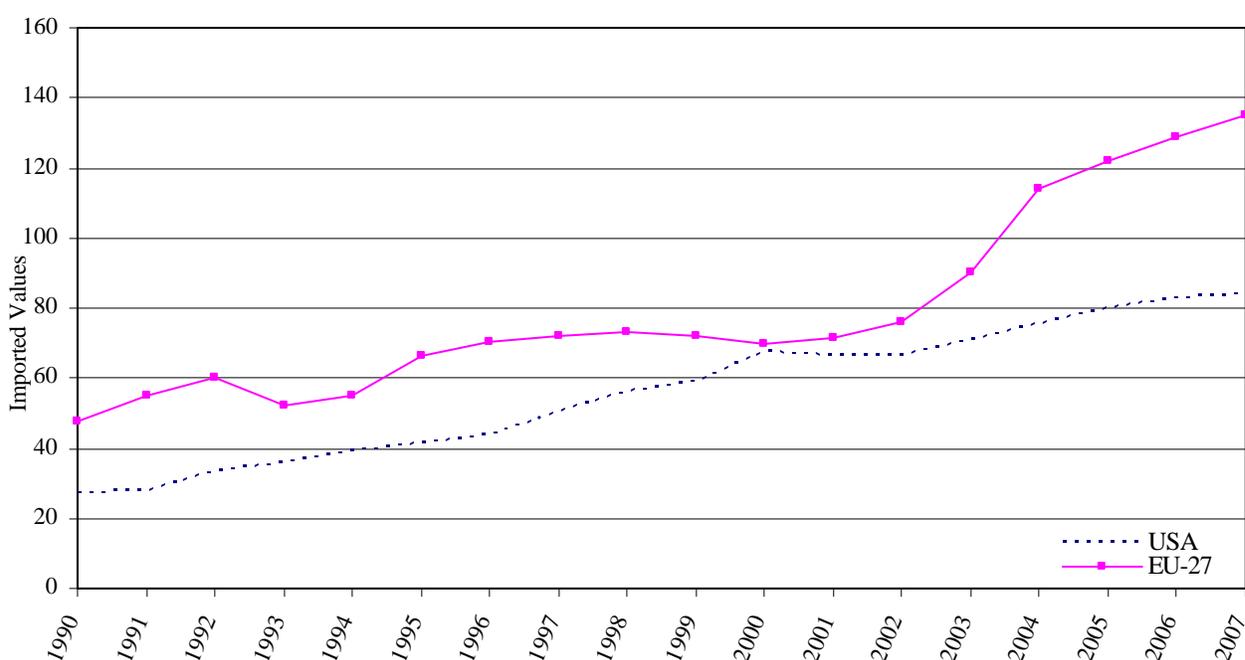
sharply between 1980 and 2000. Countries whose clothing exports exceeded US\$1 billion in 1980 included only the East Asian NICs (Hong Kong, Taiwan and Korea), along with China and the USA. A decade later, Indonesia, Thailand, Malaysia, India and Pakistan joined the queue. By 2000, Bangladesh and Sri Lanka became the newly late comers.

Although Asian countries remain to be a key source of clothing supply to the EU and USA, changes in their relative importance have been observed: Taiwan and South Korea are declining in their importance, South Asia, namely India, Pakistan, Bangladesh and Sri Lanka have stabilized, and China has climbed to the first in rank. The countries that have been most successful in exporting to the USA are those that have developed their full-package production capabilities, with Hong Kong, South Korea and Taiwan in the first wave, and China in the latter. EU's clothing imports from Asia show a similar pattern, with China and Hong Kong playing the leading role among the East exporters.

By virtue of high purchasing powers and strong demands for fashion products at a reasonable price, the EU and USA are the top two dominant clothing importers in the world. In 2007, the value of the world's clothing exports to the EU-27 and USA amounted to US\$ 138 billion and US\$ 83 billion respectively, which together represented 72 percent of the world's total clothing exports. Specifically, the clothing imports of the EU-15 amounted to US\$ 128 billion, accounting for 95 percent of the

region's total clothing imports (see Figure 1). In this case, the value of South Asian clothing exports to the EU-15 and USA amount to US\$12 billion and US\$8.5 billion respectively, which represented 9 percent and 10.2 percent of the regions' deliveries in 2007.

Figure 1. World clothing imported by the EU-27 and USA, 1990-2007(Value in US\$ billion)



Source: Compiled by the authors from International Trade Statistics Yearbook, United Nations, various issues

China's Clothing Export Performance

Clothing export trading has dominated China's total exports and become one of the foreign exchange earners since the Open Door Policy. With the combined efforts of clothing enterprises and accession of China to the WTO, China is seen to exert a

boosting effect on its clothing exports, reinforcing its role as the largest supplier to world markets. In fact, China's clothing industry has undergone a sustained rise in exports since the 1980s, with a value of US\$2 billion in 1980; ranking eighth among the global exporters. In 1990, clothing exports continued to grow to a value of US\$9 billion and moved up to third on the world order. In 2000, the export values of clothing products were recorded at US\$36 billion. Most recently, the trade value of China's clothing exports to the world amount to US\$115 billion, which represent 44% of the total world clothing exports. China has become the world's largest clothing exporter since 1995. China's clothing export to the world was observed to rise continuously during the entire period and experienced robust growth, particularly after 2000. This dramatic increase shows that China's clothing industry has undergone a substantial development in the past few decades. At the 11th Plenary Session of the 16th Central Committee of China in 2005, the initial guidelines for the future development of the clothing industry in facing keen international competition were discussed. The meeting stressed that the clothing industry should have further technological changes in terms of the production of equipment; the ability to achieve differentiation in products and enhance the overall performance in order to maintain its position as the largest exporter in the world (Chan and Au, 2007).

The impact of tremendous growth of China's clothing exports is likely to be felt most intensely by South Asian neighbours. Similarities in stages of economic development, factor abundance, technological capability and production costs entail that South Asian

economies will compete head to head with China in third markets. Thus, China's emergence may intensify the competitive pressure felt by these suppliers, slow the growth of their clothing exports, and more seriously, challenge the sustainability of high growth. This vicious circumstance is the motivator behind the analysis in this paper. We explore the extent that China's clothing exports is affecting the delivery of South Asian suppliers to the EU-15 and US markets over the period 1990-2006 by using the gravity model and an identification strategy that explicitly acknowledges the potential endogeneity of Chinese exports. We distinguish the impact of China's clothing exports on South Asian suppliers to the EU-15 and US markets. In contrast to previous efforts that address this issue, we estimate the impacts in question by using econometric methods, rather than deriving them from a simulation model where the results flow from the assumption implicit in the standardization of key parameters. The result confirms the tendency for China to displace the exports of South Asian nations.

Previous research on China's impact on South Asia

The potential impact of China has generated a growing literature. Studies in this area can be grouped by methodology. A previous analysis addresses the issue in the broader context of the impact of China's accession to the WTO in a computable general equilibrium (CGE) model. For example, Lanchovichina and Walmsley (2005) simulated a multi-country, multi-sector model of international trade, and assumed China's WTO accession as a liberalization of its trade regime that give rise to its propensity to exports. They proved that while increasing its own export, China reduces the exports of other Asian and summarized that a decline in exports was mainly due to textile and clothing trade.

CGE has proved to be a useful tool for analyzing the impact of a wide range of possible policy changes based on different scenarios. However, CGE models are stylized simplifications of the world economy and based on assumptions, which fashion their outputs. For instance, since growth is often assumed to be exogenous, these models fail to capture the dynamic impact of China's rise on other regions and hence, underestimate the full effects. Moreover, there are uncertainties over the estimated trade elasticity as most models fail to take into account the key aspects of China's WTO membership, such as liberalization of services and policies to attract foreign investment (IMF, 2004).

Another set of previous studies employ an econometric methodology to examine this issue. Eichengreen et al. (2004) examined the ways that China and Hong Kong exports have affected the growth of NIEs and ASEAN members over the same period, 1990-2002, using a gravity modeling approach. Their results show that China crowds out less-developed Asian countries exports of consumer goods in third markets. Most recently, Greenaway et al. (2008) applied the same method and explored whether the displacement effect on Asian exports differs when exports from Hong Kong and China are combined in comparison to the narrow case of Chinese exports only over the period of 1990 to 2003.

The limitations of the literature are now apparent. The results of simulation studies depend on the ways that the models in question are calibrated, which tend to implore the question at hand. Econometric studies have not yielded precise estimations of the key effects, leading investigators either to draw inferences from coefficients that are not significantly different from zero or suggest on the basis of their failure, identification of a significant effect that one does not exist. This gives us more than enough motivation to reconsider the question.

Econometric Methodology and Data Source

The use of a gravity model is well-established in the international trade literature (Bayoumi and Eichengree, 1995). In its basic form, posits that trade between two countries is positively influenced by the economic size of the trading partners and negatively affected by distance.

The gravity model was first used in applied econometric work by Tinbergen (1962) and Poyhonen (1963) to explain bilateral trade. Although it has obvious intuitive appeal and performed well empirically, it is challenged as having no theoretical foundations. Subsequent work has risen to this challenge and demonstrated that the gravity model can be derived from a number of standard theories of trade. Anderson (1979) showed that it can be derived under assumptions of product differentiation and monopolistic competition. Deardorff (1998) justified the model by using two extreme cases of

Heckscher-Ohlin: frictionless trade in homogenous goods and impeded trade in differentiated goods. In 2002, Harrigan conducted an extensive review of the gravity model with reference to various major trade models, including the Armington, monopolistic competition and general equilibrium. The key drivers of bilateral trade in gravity models are resistance and mass, and this work provides the theoretical underpinning for such.

Empirically, the framework has been used to evaluate policy issues, such as regional trading agreements (Sharma & Chua, 2000), multilateral agreements (Subramanian & Wei, 2003); implications of WTO accession for current non-members (Lissovolik & Lissovolik, 2004) and calculation of trade potential (Nilsson, 2000). While most of the aforementioned policy issues were widely discussed in the literature, the impact of China's growth in clothing industries as seen through the lenses of the gravity model has not been fully explored. Moreover, past gravity model research (Batra, 2004; Athukorala, 2007) were only centered on regional investigations and general trading scenarios, but not apparel specific. Thus, this study will make a significant contribution to existing literature by filling this gap, extending a broader analysis on the impact of China's clothing trading exports on South Asian suppliers to the EU-15 and USA markets from 1990 to 2006.

As the study is to explore the impact of China's growth of clothing trade on other countries, we adopt the following gravity specification:

$$\ln(\text{EXP}_{ij})_t = \alpha + \beta_1 \ln(\text{ChEXP}_i)_t + \beta_2 \ln(\text{GDP}_j)_t + \beta_3 \ln(\text{PCGDP}_j)_t + \beta_4 \ln(\text{GDP}_i)_t + \beta_5 \ln(\text{PCGDP}_i)_t + \beta_6 \ln(D_{ij}) + \beta_7 \text{POPGRATE}_{it} + \beta_8 \text{REXRATE}_{ijt} + \beta_9 \ln(\text{WAGE}_i) + \beta_{10} \ln(\text{FEMALE}_i) + U_{ijt}$$

where t ($t = 1 \dots 17$) starting from 1990 to 2006, representing the time when trading transactions took place;

$\ln(\text{EXP}_{ij})_t$ = Log of export value of clothing in millions of US dollars from South Asian suppliers to the EU-15 and USA markets, i denotes the suppliers' variables, j represents the EU-15 and USA;

α = Unobserved effect or fixed effects which do not change over time, and captures all unobserved time-constant factors that affect EXP_{ij} ;

β = Slope parameter, also known as the partial regression coefficient. It represents the expected increase in the outcome variable for a unit increase in the predictor variable. In this case, the slope coefficient β_1 measures the change in the conditional mean of dependent variable (exported clothing value) per one unit change in independent variable X_1 (GDP), holding the values of the other independent variables $X_2 \dots X_8$ constant.

$\ln(\text{ChEXP}_i)_t$ = China's exports to country j

$\ln(\text{GDP}_j)_t$ = GDP log of South Asian clothing suppliers in millions of US dollars;

$\ln(\text{PCGDP}_j)_t$ = Per capita GDP log of suppliers in millions of US dollars;

$\ln(\text{GDP}_j)_t$	= GDP log of the EU-15 and USA in millions of US dollars;
$\ln(\text{PCGDP}_j)_t$	= Per capita GDP log of the EU-15 and USA in millions of US dollars;
$\ln(D_{ij})$	= Geographical distance (in km) log between the individual capitals of the EU-15, Washington; the capital of USA and the capitals of their South Asian suppliers;
$\ln(\text{POP}_{jt})$	= the population size log of the EU-15 and USA;
REXRATE_{ijt}	= the real exchange rate of foreign currency per unit in US dollars;
$\ln(\text{WAGE}_j)$	= Wage log of suppliers in millions of US dollars;
$\ln(\text{FEMALE}_j)$	= Log of the number of women in the workforce of South Asian suppliers;
U_t	= other omitted influences on exports

The analyses include exports between four South Asian countries and sixteen importing countries. The dependent variable of the gravity model is the clothing export values, in log form, between pairs of countries. The independent variables include a set of macroeconomic factors: the log exports of country i to country j, the log GDPs of the two countries, log per capita GDPs of the two countries, distance between them, real exchange rate, log of population size of importers and labor costs of the exporters.

Since the economy size of the exporting and importing countries is usually measured by the GDP, the GDPs of importing countries and their exporters are considered to

represent the economic masses and the impact of clothing exports on the country's economy. Moreover, GDPs also indicate the supply capabilities of clothing exporting countries. Based on the gravity principle, per capita GDP of the exporting country is used as a proxy of capital intensity. As the clothing industry is a labour-oriented industry, per capita GDP of South Asian suppliers is utilized to indicate the impact of the monetary conditions for the workforce in countries with clothing exports. Additionally, in order to gain a sense of the status in the EU-15 and USA economies on clothing imports, per capita GDP of the importers are included in the list of independent variables. The identification of distance effects on bilateral trade has proven to be one of the most robust empirical findings in international trade (Frankel and Rose, 2002). Thus, distance is considered in the equation. Population size of the importing countries have a positive relationship with the consumption of manufactured commodities and therefore, to secure a better understanding of this effect on clothing imports, population size of importers are taken into consideration.

The real exchange rate is a key factor affecting trade flows. The depreciation (appreciation) of a country's currency against other currencies stimulates (reduces) the country's exports. Thus, it is considered in the model. Since clothing trade liberalization has progressed after the completion of the ATC in 2005, price competition among clothing suppliers have become more intense. The level of exporters' worker wages is one of the crucial deciding factors in the entire clothing trade flow. Nearly three quarters of workers working in the global clothing industry are women; the participation rate is

even higher in developing countries. As more female workers provide higher production capacity for clothing exports, therefore the number of female workforce is included in the list.

Worth noting is China's exports to the same market is included as one of the independent variable so as to analyze the impact of China's emergency on clothing exports of South Asian countries. It is possible that the variable of interest, China's exports, in specification, may not be exogenous. Therefore, it is important to recognize its potential endogeneity. A variety of unobservable factors will probably affect the error term and thus India's exports to Belgium may also affecting China's exports to Belgium, creating a correlation between the error term and the key explanatory variable. The standard treatment for this type of problem is to estimate by two-stage least squares (TSLS) using an appropriate instrumental variable, the difficulty being the paucity of plausible instruments that is the bane of empirical macroeconomics. Fortunately, in the present context the gravity trade model suggests instruments that are both plausible exogenous and strongly correlated with Chinese exports. The obvious instrument, in other words, is the distance between China and the country that is the destination of its trading partners.

Data Source

Clothing export values of all exporting economies were obtained from

<http://comtrade.un.org>. Data on real GDP, per capita GDP, real exchange rates and population size of countries were secured from the International Financial Statistics database. The distance between countries was obtained from <http://www.indo.com/distance/index.htm>. The labour wages and the number of workforce were extracted and compiled from the UNIDO industrial statistics dataset. Our panel consisted of observation for sixteen importing countries and four South Asian exporting countries from 1990 to 2006. Importers include 16 countries: Belgium, France, Italy, Luxembourg, Netherlands, Germany, Denmark, Ireland, United Kingdom, Greece, Portugal, Spain, Austria, Finland, Sweden and United States Exporters including 4 South Asian countries, Bangladesh, India, Pakistan and Sri Lanka.

Econometric Estimation

We started with the equation for the impact of China's clothing exports on the exports of South Asian countries. Recall that we included observations for export trade between South Asian countries and their trading partners, and observations for China's exports, which is treated as one of the independent variables in the model.

Table 1 below shows the result of the impact of China's clothing exports on exports of South Asian countries to third markets (1990-2006).

Dependent Variable: $\ln(\text{EXP}_{ij})$
Method: Panel Two-Stage Least Squares

Independent Variables	Coefficient
Constant	-26.68***
Ln(ChEXPi)	-0.32**
Ln(GDP _i)	+0.67**
Ln(PCGDP _i)	+1.17***
Ln(GDP _j)	+1.21***
Ln(PCGDP _j)	+0.29***
Ln(D _{ij})	-1.67***
Ln(POP _i)	+1.03***
(REXRATE _{ij})	-0.42***
ln(WAGE _i)	-0.73**
ln(FEMALE _i)	+0.83**
Adjusted R²	0.68
N=1088	
** Significant at .05 level, ***Significant at .01 level	

The gravity model fits the data well and all estimated coefficients are significant at $p < 0.05$ (see Table 1). As expected, the results show that exports increase with the GDP, GDP per capita of the importers and exporters, population and the number of female workers. Exports fall with distance, real exchange rate and labour wage. As a whole, the model accounts for 68% of the variance of clothing export values.

Impact of China's Clothing exports on South Asian suppliers

The variable of particular interest; the fitted value of Chinese exports to the third market, enters with a negative coefficient. This implies that, other things equal, a 10% in Chinese clothing export to a particular market results in a 3.2% decline in the sales of the competing South Asian economies in the EU-15 and USA market. An obvious interpretation is that the growing competitiveness of Chinese clothing export is causing consumers in other parts of the world to turn away from other suppliers in favour of China. Higher efficiency and a skilled workforce help in achieving the full package manufacturing in a short lead time as the right time in marketing is a critical factor in the fashion business. In addition, China is a large country which is nearly self-sufficient in raw materials. It has the world's largest production capacities for cotton and man-made fibres. It also has ready access to high quality imported fabrics from South Korea, Taiwan and Japan, in order to provide better quality products and open up the high-end markets.

GDP and per capita GDP

The analytical results aligned with other gravity trading model studies of bilateral trade (Glick & Rose, 2002), and showed that the GDPs of importers and exporters positively influenced the clothing trade. This conformed to the theoretical expectation; a higher GDP creates a stronger demand for clothing imports and also a larger supply for exports.

The results can be interpreted as a 10% increase in importers' GDPs results a 12.1% increase in their clothing imports, while the same amount of GDP increase for exporters result in a 6.7% increase in their exports. Similar effects are also observed for exporters' and importers' per capita GDPs.

Physical distance

Consequent to the growing pressure for quick responses, geographic proximity is an important criterion for clothing sourcing. The variable geographical distance (D_{ij}) negatively affects apparel trading, reflecting that an increase in distance and thus logistics costs lead to a reduction in clothing exports. This is in accordance with the common prediction that greater physical distance between bilateral trading destinations erects a barrier for trades (Au & Chan, 2008).

Population

Population demonstrates a positive effect on clothing trade flow. As shown in the results, a 10% increase in the population size of importers results in a 10.3% increase in clothing imports. This supports the view that larger population size is associated with greater import value (Chan, Au & Sarkar 2008).

Exchange rates

The exchange rate coefficient is negative, suggesting a depreciation of exporting countries' currencies against those of their partner countries, and thus promoting clothing exports. This confirms the expectation that whenever there is a real depreciation or appreciation of foreign currencies against the American dollar, there will be an increase or decrease in exports (Chan & Au 2007).

Wages

For the wage variable, the coefficient shows a negative sign. This implies that suppliers with lower production costs which result from low labour cost are seen to be attractive source for importers. This is particular true for basic clothing items that are sold all year round and that are not highly time sensitive. However, one interesting point is although China has higher labour costs (US\$1) when compares with South Asian countries, namely, Bangladesh, India, Pakistan and Sri Lanka, their hourly wages were US\$0.39, US\$0.38, US\$0.23 and US\$0.57 respectively in 2007 (Werner International Management Consultants, 2007), China still maintains its comparative advantage due to its highly effective and disciplined workforce which can achieve a full package process in the short period of time.

Female Workers

The results show that a 10% increase of female workers in the exporting countries results in an 8.3% increase in clothing exports. It is true that clothing industry depends

heavily on the supply of female workers in the expansion of production capacity. Unlike other industries that are capital intensive, production of clothing requires lots of manual handling even though use of some advanced machines and equipment can improve productivity.

Conclusions

The significance of this empirical study has enabled the exploration and the possibilities and ways that the growth of China's clothing exports is displacing exports of South Asian countries to EU and USA markets over the period of 1990 to 2006. Aggregate analyses are undertaken and the endogeneity of Chinese exports are accounted by applying instrumental variables with country fixed effects. The negative impacts of China's emergence of clothing trade on South Asian countries were analyzed. The results indicate that the export competitiveness of China has affected the less developed South Asian countries. Moreover, the result provides strong support for the gravity trading model, shows that GDP, per capita GDP, physical distance, population, exchange rates, wages and the number of female workers are significant factors that would influence clothing exports.

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