

Chinese Dragon venturing into GMS territory : Does it Makes Sense?

Nilanjan Banik* Khanindra Ch. Das**

Abstract

The notion that China is factory of the world is now changing. Factories in China are shifting their production base to neighboring Asia, primarily because of higher input costs in China, a volatile Chinese exchange rate, and protectionist measures targeted against Chinese exports. In this paper, we examine the location substitution effect for China: Chinese firms are exporting primary, intermediate and machinery items, meant for producing final output in the Greater Mekong Subregion (GMS). Results suggest that GMS countries are exporting finished items to China, that are increasingly getting manufactured using primary and intermediate inputs imported from China.

Key Words : Trade, Location Substitution Effect, China, GMS

JEL Classification : F14, F15, F21

* Professor, Institute for Financial Management and Research (IFMR), Chennai. Corresponding author. All comments to nilbanik@gmail.com.

** Research Scholar, Institute for Financial Management and Research (IFMR), Chennai.

1. Introduction

China is the second largest economy in the world after the US. Trade account for around seventy percent of China's gross domestic product (GDP), making it an important component of national income. The reason for success, especially in trade, has to do with the fact that China imports primary and intermediate goods from neighboring Asia, assembles them in the factories of coastal provinces, such as Guangdong, and transport these assembled products through its port at Hong Kong and Shenzhen, to destinations such as in Europe, and the USA. Most of these intermediate inputs are manufactured in Thailand, Myanmar, and Viet Nam, which are finally used for producing Chinese made electronic items. China's trade pattern, which is, maintaining trade surplus with the EU and the US, whereas, maintaining trade deficits with Japan, Taiwan, South Korea, and the ASEAN – supports the proposition that China is “factory of the world.” In fact, studies have shown there is an increase in foreign content for Chinese exports. Assembling, and processing of imported inputs meant for re-exports account for about half of China's foreign trade (Hummels et al., 2001; Koopman et al., 2008). Higher foreign content of its exports is due to vertical intra-industry trade¹⁾ which has grown manifold in China, and possibly may have been responsible for its diverse exports base, from electronics and machinery to textile and apparel (Fukao et al., 2003; Ando, 2006; Gaulier et al., 2007).

Table 1.

China's Merchandize Trade (in 100million US \$)

Country or Region	2009			2010		
	Export Value	Import Value	Trade Surplus	Export Value	Import Value	Trade Surplus
Europe	2647	1620	1026	3552	2179	1373
USA	2208	775	1433	2833	1021	1812
ASEAN	1063	1067	-5	1382	1547	-165
Japan	979	1309	-330	1210	1767	-557
South Korea	537	1025	-489	688	1383	-696

Sources : Statistical Communiqué of the PRC, 2011

¹⁾ Vertical integration happens when a firm controls several steps in the production and distribution process, such as a firm having its own supply and distribution facilities. According to Ando (2006) the explosive increase in vertical intra-industry trade in East Asia is largely due to the expansion of back-and-forth transaction in vertically fragmented cross-border production process.

However, recently this notion about China being factory of the world is changing. Factories in China are shifting their production base to neighboring Asia, primarily because of higher input costs in China, a volatile Chinese exchange rate, Chinese exports being increasingly targeted by its major trading partners, and a fall in price-competitiveness in producing goods in mainland China. Pushed by these domestic disadvantages and external restrictions, and helped by change in government policy to circumvent such problems, there has been industrial restructuring in the form of diversification of production base of some of the products to cheaper overseas destinations. This has been part of 'going global' strategy that has lead to offshore equity investments and acquisitions. Such an effect relating to the shift in production location from home country to cheaper overseas locations (also known as location substitution effect), is possible for firms in China because their method of production – particularly the low-and-medium technology products that can be easily replicated in other developing countries. If China were to shift its factories outside China, we would expect that China is exporting primary, intermediate and machinery items, to neighboring Asia, and importing finished manufactured items from them.

In this paper, we examine this hypothesis, that is, location substitution effect with respect to Chinese investment in the Greater Mekong Sub-region (GMS)²). Although Chinese companies are investing in countries around the globe, GMS is a natural choice given their geographical proximity to China, and free trade agreements that prevail between countries in the GMS and China. Results suggest that China is exporting primary and intermediate inputs (including machinery items), and in turn expanding manufacturing base in the GMS. Intermediate inputs are used for producing final manufactured items such as telephones, computers, air conditioners, refrigerators, and televisions, in Viet Nam and Thailand; whereas primary items comprising of textile and woven fabrics are used in garments manufacturing units in Cambodia, Laos, and Myanmar. For the location substitution effect hypothesis to be valid, we would expect a greater level of association between imports of primary and intermediate items from China with the exports of finished manufactured items to China, both with reference to the GMS. Our result supports this hypothesis about the existence of location substitution effect.

This aspect about examining location substitution effect has not been considered before, and this study fills this gap. Through this study we expect to complement an important aspect of new trade theory, which suggests, a way to explain vertical intra-industry trade is to look at the extent of firm-level heterogeneity. Extent of heterogeneity within any given industry affects outsourcing decision – with high

²) GMS comprises of Yunnan and Guangxi province of Peoples Republic of China (PRC), Thailand, and CLMV (Cambodia, Lao People's Democratic Republic, Myanmar, and Vietnam) countries. The GMS is a natural economic area held together by the Mekong River.

productivity firms sourcing intermediate inputs in international markets, and multinational firms with heterogeneous productivity self-select into different host countries (Helpman, 2006; Castellani et al., 2010; Chen and Moore, 2010). Therefore, this study will also help to understand changing nature of international trade and investment linkages. The rest of the paper is organized as follows. Section 2 documents reasons for China to relocate its production base. Section 3 deals with the methodology, and data used for this study. Section 4 contains results. And, we conclude in section 5.

2. CHINA'S COMPETITIVE DYNAMICS

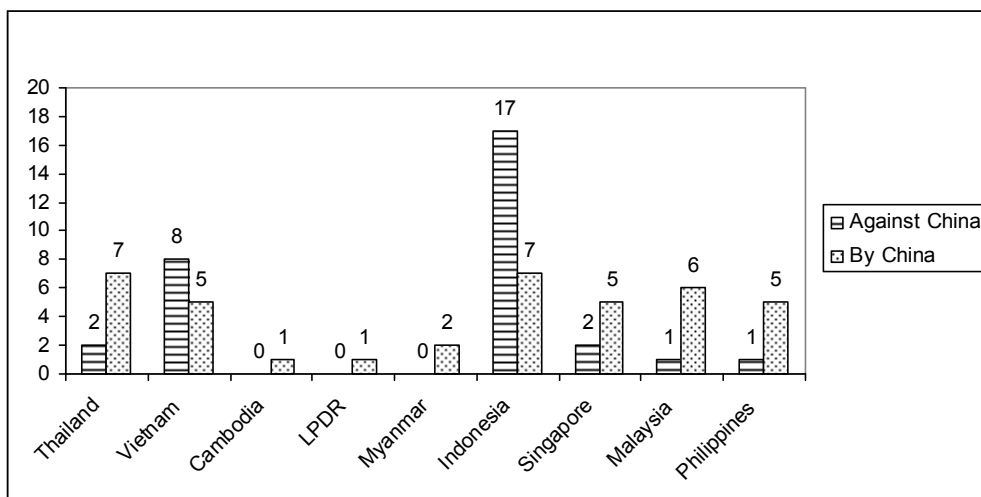
Before empirically examining the applicability of location substitution effect we discuss the factors that are motivating the Chinese firms to relocate their production base outside mainland China.

Economic Crisis and the Chinese Exports

The financial crisis since 2007 has seriously affected world trade, with some governments resorting to protectionist measures, such as antidumping and countervailing measures to protect their domestic industries. It is no surprising to see that such protectionist measures is hurting China the most, especially because during 2008 and 2009, Chinese exports value ranked highest in the world. During 2008, Chinese exports to the EU, and the US fell by 19.4 per cent, and 12.5 per cent, respectively. China's trade surplus fell from US\$ 298.1 billion in 2008 to US\$ 195.8 billion in 2009.

Global Trade Alert database (a database tracking number of protectionist measures imposed around the world) has indicated that as many as 659 measures have been initiated against the Chinese exports in 2009. Most of these measures (numbers of measures initiated are indicated in parenthesis) have originated from – Russia (31), Germany (18), France (16), United Kingdom (17), Spain (16), Italy (15), Netherlands (15), Sweden (13), Austria (13), Belgium (13), Finland (13), in Europe, and USA (9).

Chinese firms are looking for an alternate production base to evade such protectionist measures. Given their geographical proximity, the GMS member countries become a natural choice. Figure 1 shows when it comes to imposition of protectionist measures, the ASEAN member countries are much less hostile towards Chinese exports in comparison to the EU, and the US.



Source : Global Trade Alert, November 2010.

Figure 1.
Number of Measures against (and by) China

Higher Input Cost

The China growth story is still intact making it a favorable destination among the foreign fund managers. Last year, China has received more foreign fund - much higher than any of other 4 emerging economies in the BRICS group, comprising of Brazil, Russia, India, and South Africa. The expectation about future appreciation of Chinese renminbi also has been responsible for enhancing inflow of foreign funds. Chinese central bank has been frantically trying to keep renminbi from appreciating further by actively intervening in the foreign exchange market. Active intervention in the foreign exchange market has resulted in inflation (Zhang, 2009). In addition, wages of migrant workers, land, property rents, and power prices, have all registered an increase. Measured on a year-over-year basis, as of November 2010, labor costs have gone up by 21 per cent, and the home prices across 70 cities in China have gone up by 7.7 per cent. 2010 estimates suggest minimum annual wage rates for Cambodia, Laos, and Viet Nam are US\$ 600, US\$ 434, and between US\$ 1200-1500, respectively. If one were to add the mandatory welfare allowances to the minimum annual wage rates, then the Chinese labor costs are at least double compared to laborers in other regions in south-east Asia (Devonshire-Ellis, 2011).

Li and He (2007) provide evidence about foreign fund entering into the real estate sector. What is worrisome is that property prices are rising despite the government having

ownership right for land – indicating possible real estate bubble. China has also imposed stricter pollution control norms on its industries, raising the marginal cost of producing goods in China, further.

Hence, Chinese firms stand to gain by shifting production base to the neighboring south-east Asia, with a lower production cost. Also, as Chinese currency has been appreciating since 2005, and with an expectation that it will appreciate further, there is a likelihood of Chinese exports becoming costlier. Chinese firms can gain by importing raw material (as imports become cheaper when currency appreciate), and use this imported raw material to produce finished goods outside China.

Access to a bigger market

Trade and investment measures undertaken in the south-east Asian region are non-discriminatory and complementary in nature. These nations are increasingly driving down differences among each other by reducing tariffs, and other border costs. Most of the items are traded at zero tariffs among the member countries. Thailand, Laos, Cambodia, Viet Nam, and Myanmar are all part of ASEAN. As on 1 January 2010 duties on 99.65 per cent of all tariff lines under the Common Effective Preferential Tariff Scheme for the ASEAN Free Trade Area have been eliminated. For the newer ASEAN Member States – Cambodia, Laos, Myanmar, and Viet Nam – 98.96 per cent of total tariff lines are within the tariff of 0 to 5 per cent range. Since October 2003, China and Thailand have taken lead in implementing zero tariffs on agricultural products, covering 200 types of fruits and vegetables. China has also granted zero tariffs treatment to Cambodia (83 products), Laos (91 products), and Myanmar (87 products). Free market access for Chinese exports into this region means a larger market share for their manufacturers.

Inflation, Exchange Rate Appreciation and External Price Competitiveness

Rapid economic growth in China over the last two decades has been accompanied by a surge in foreign capital inflows both in current and capital accounts (the ‘twin surpluses’), causing a massive accumulation of foreign exchange reserve (US\$ 2.65 trillion by September 2010).³⁾ Accumulation of foreign exchange reserve has its own risks, including the cost of holding in low yielding financial assets of foreign governments. Before the

³⁾ China’s entry into WTO in 2001 has made it easy for many multinational firms to invest in China, an attractive investment destination (He and Lyles, 2008).

global economic crisis started, China has invested a major portion of their trade surplus in US dollars and Euro-denominated assets. Values of these assets are now falling because of Federal Reserve in the US, and European Central Bank in the EU, are printing too much money. In fact, USA is investing in assets in China, and other emerging economies in Asia through Foreign Direct Investment (FDI) route, thereby exporting inflation (Banik, 2011). The EU, and the US still remain the largest investors in China. Such investment is leading to accumulation of foreign currencies, making it difficult for the Chinese monetary authority to prevent growth of ‘excess liquidity’. A part of this excess liquidity is finding its way into the Chinese stock market, further accelerating inflation (Li and He, 2007). In fact, for the period between 1980 and 2002, pass through effect of exchange rate translating into higher domestic price was much less in comparison to the period after 2002 (Yu, 2007).

The People Bank’s of China want to curb this inflation by formulating contractionary monetary policy, raising the interest rates. The rise in interest rates in China relative to the US in recent years has accentuated the inflow of capital. The appreciation of Chinese renminbi alongside with an increase in inflation has hurt Chinese external competitiveness. Following goods market approach of determining the value of exchange rate, we define external competitiveness of any country, as the difference between domestic inflation and movement in its exchange rates. As is evident from Table 2, China’s external competitiveness has fared reasonably well against many of the GMS countries until 2006 but has started to fall thereafter, especially, since 2007. For example, in 2007, Vietnam and Cambodia, have shown better external price competitiveness. In particular, in 2009, Thailand, and Cambodia, has done better relative to China in terms of price competitiveness. Starting 2000, price competitiveness is declining for China. This is going to hurt price elastic low technology intensive exports, such as leather foot ware, and apparel. In fact, share of these items has fallen in total exports (Amiti, and Freund, 2008). The fall in price competitiveness has also motivated Chinese firms to relocate their production base outside China.

Table 2.

External Competitiveness (change in price – change in nominal exchange rate)

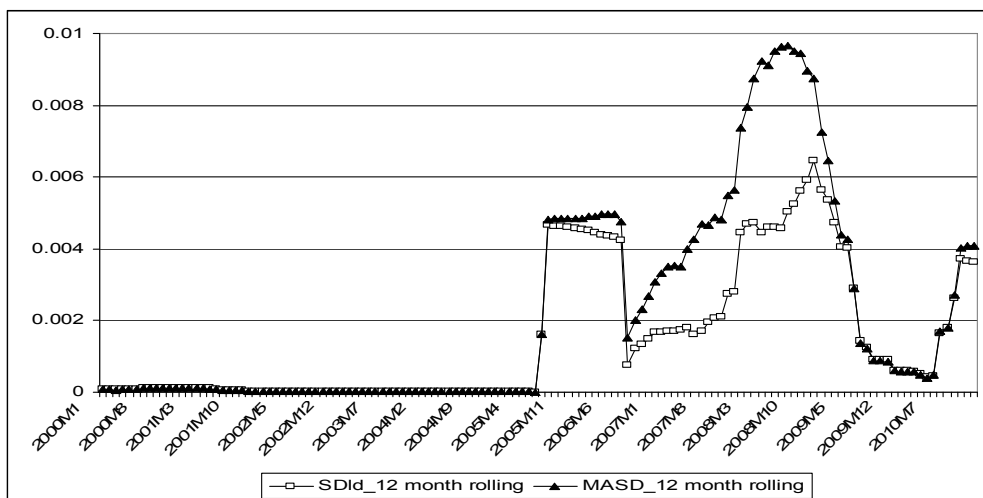
Year	China	Thailand	Vietnam	Cambodia	Laos
	0.25	-4.49	-3.32	-1.66	14.02
2001	0.74	-9.14	-4.37	-2.57	-5.71
2002	-0.76	4.01	0.07	3.33	-1.67
2003	1.15	5.24	1.71	-0.36	10.39
2004	3.89	5.80	6.23	2.84	10.31

Year	China	Thailand	Vietnam	Cambodia	Laos
2005	2.82	4.55	7.56	4.45	6.51
2006	4.16	10.45	6.53	5.88	11.45
2007	9.34	11.16	7.61	8.82	10.00
2008	14.53	8.89	21.89	25.05	16.57
2009	0.98	-3.77	2.38	-2.76	2.64

Note : Higher values indicate fall in competitiveness.

Source : Calculated from International Financial Statistics, International Monetary Fund.

In addition to, higher inflation rates and interest rates, the Chinese renminbi has also become more volatile. Once the longstanding peg to the US dollar was abandoned in July 2005, the renminbi-dollar exchange rate has shot-up, appreciating by about 20 percent, (Figure 2).



Source : Calculated from International Financial Statistics, International Monetary Fund.

Note : Volatility is calculated using (a) the standard deviation of the first difference of the log of monthly exchange rate (SDId), and (b) the moving average standard deviation (MASD) of the log of (monthly) exchange rate. Such measures have been used for studying the impact of exchange rate volatility on exports (See Tenreiro, 2007; Chit et al., 2010).

Figure 2.
Volatility of RMB-dollar Exchange Rate

Exchange rate volatility can have negative effect on international trade, directly through uncertainty and adjustment cost, and indirectly through its effect on allocation of

resources (Côte, 1994).

3. METHODOLOGY AND DATA

Trade flow is usually explained using the gravity model. The original application of the Newtonian law of gravity in the field of economics goes back to the work of Tinbergen (1962), Poyhonen (1963), and Linnemann (1966), suggesting that bilateral trade between two nations is positively related to their national income, and inversely related to the distance between them.⁴⁾ For this study, to examine, location substitution effect for China, we use a variant of the gravity model using two-stage least squares technique (2SLS). We use 2SLS framework to control for endogeneity, and also to capture simultaneity of two-way trade between China and the GMS. Following, Leamer and Stern (1970), and Magee (1975), we specify the exports and imports demand functions. For the purpose of our analysis, we categorize the commodities into two groups, namely, primary and intermediate exports including machinery, and final manufactured goods (See, the Appendix). For this classification, we use Standard International Trade Classification (SITC) Revision 3 at a two-digit level.

Data Source: Data on trade (both exports and imports) between China and individual countries within GMS are obtained from the United Nations COMTRADE database. Trade figures are reported in constant US dollars for each country. The data are available annually and involve trade values of 4 GMS countries, namely, Thailand, Vietnam, Cambodia, and Laos, with China.⁵⁾ The time period is between 2000 and 2009. In total, we have 40 observations, involving 4 countries and 10 years data. We choose this time period because GMS initiative was undertaken starting early 2000, and there were considerable trade integration happening in this region (through tariffs reduction) during this period.

For commodity classification into primary, intermediate, and final manufactured items, we have followed the classification put forward by Lall (1998, 2000). Primary exports contains items falling under SITC headings 0 to 4. Intermediate and machinery items fall under SITC headings 5, 6, 7, and 8, whereas, the final manufactured items falls under SITC headings 7, and 8.⁶⁾ To arrive at overall primary, intermediate and machinery exports, and

⁴⁾ For more discussion about the theory of the gravity model, see Anderson and van Wincoop (2004).

⁵⁾ Trade statistics for Myanmar are not available. Accordingly, we have to exclude Myanmar from our analysis.

⁶⁾ For a detail classification, see the Appendix. SITC headings 7 and 8, contains both final manufactured items, and intermediate and machinery items. For our analysis, machinery items are treated as an intermediate item.

final manufactured exports, we aggregate trade values for all commodities falling under respective categories.

Estimation

We estimate the following equations:

$$FX_{ic}^t = \alpha_1 + \beta_1 PIM_{ic}^t + \beta_2 GDP_c^t + \epsilon_i^t \dots \dots (1)$$

$$PIM_{ic}^t = \alpha_2 + \gamma_1 FX_{ic}^t + \gamma_2 PIM_{ic}^{t-1} + \gamma_3 GDP_i^t + \epsilon_i^t \dots \dots (2)$$

where, FX_{ic}^t is the total value of final manufactured exports at time period t from country i to China ($i =$ Thailand, Vietnam, Cambodia, and Laos);

PIM_{ic}^t refers to primary, intermediate and machinery imports of country i from China;

GDP_c^t is China's GDP, and GDP_i^t is i^{th} country's GDP.

FX_{ic}^t and PIM_{ic}^t are the endogenous variables, whereas, GDP_c^t , GDP_i^t , and PIM_{ic}^{t-1} are the exogenous variables. As equation (1) is overidentified, we use 2SLS to derive efficient estimates. For comparison, and to capture the individual country effect, we also consider the least square dummy variable (LSDV) model. ϵ_i^t is the disturbance term. In LSDV, ϵ_i^t captures both country specific (cross sectional) and temporal effects.⁷⁾ We use country specific dummies to capture individual country characteristics. As we are not randomly selecting countries within GMS, there is no necessity to undertake random effect modeling (where it is assumed we are randomly selecting sample countries from the population).⁸⁾ Also, since cross sectional element in our case is small (comprising of 5 different countries, including China), the dynamic panel approach of generalized method of moments (GMM) estimation techniques, which are expected to yield more consistent estimates in presence of large cross section, are not considered.⁹⁾ In a dynamic panel there can be an element of co-integration among exports, imports and GDP – as all of these variables tend to move in the same direction. However, Levin, Lin and Chu test confirms absence of non-stationarity, and hence co-integration in this dynamic panel framework. For each one of these variables superscript t stands for time, and subscript c implies China. All the variables, except for the dummies (as in the case with LSDV), are reported in log.

⁷⁾ We use j-1 dummies to avoid dummy variable trap. For this analysis, Laos is treated as the base country.

⁸⁾ In fact, fixed effect and random effect are going to yield similar results when all samples in the population are used for regression.

⁹⁾ For more on the application of GMM techniques in the context of gravity equation see Arellano and Bond (1991) and Blundell and Bond (1998). This is a widely acknowledged that use of GMM techniques in the presence of small number of cross section element will increase the finite sample bias.

4. RESULTS

Table 3.
Results of the Estimated Model for 4 GMS Countries

Variable	FX_{ic}^t (LSDV)	FX_{ic}^t (2SLS)	PIM_{ic}^t (LSDV)	PIM_{ic}^t (2SLS)
Constant	-0.1231 (0.2182)	-0.0240 (0.2254)	0.2793 (0.2456)	-0.1681 (0.1186)
PIM_{ic}^t	0.6713*** (0.1355)	0.7822*** (0.1455)	-	-
FX_{ic}^t	-	-	0.8572** (0.3598)	-0.0751 (0.2186)
GDP_c^t	0.0773 (0.1154)	0.0260 (0.1191)	-	-
GDP_i^t	-	-	1.3835** (0.5895)	0.1621 (0.1818)
PIM_{ic}^{t-1}	-	-	1.0100*** (0.1143)	1.0088*** (0.1238)
Dummy Thailand	0.9933*** (0.2824)	-	-1.2308* (0.6494)	-
Dummy Vietnam	-0.4777* (0.2714)	-	-0.2010 (0.2314)	-
Dummy Cambodia	-0.0587 (0.1820)	-	-0.0519 (0.0888)	-
Adjusted R2	0.8629	0.8589	0.9695	0.9644
F Test	19.36***	19.24***	80.52***	73.78***

*** significant at 1%, ** significant at 5%, * significant at 10%
Figures in the parenthesis are standard errors.

Table 3 indicates that imports of primary, intermediate and machinery items from China are related to the exports of finished manufactured items to China, both with reference to the GMS. A positive and significant β_1 , γ_1 , and γ_2 , support the location substitution effect hypothesis. A large adjusted R^2 reveals a higher degree of association between intermediate inputs and final output. The 2SLS and the LSDV estimates suggest that final exports of GMS countries going to China are increasingly getting manufactured using primary, intermediate and machinery items imported from China. This result is validated by high correlation coefficient of 0.81 between primary, intermediate and machinery imports from China with final manufactured exports to China. Statistically,

insignificant Chinese GDP may indicate Chinese imports from GMS is not driven by China's income but because of other factors such as procuring goods from cheaper overseas destination. In LSDV, the significant country dummies indicate the importance of GMS in China's trade.

The location substitution effect is substantiated by growing importance of GMS in China's total trade.¹⁰⁾ Banik (2011) indicates that China is exporting primary and intermediate inputs (including machinery items), and in turn expanding manufacturing base in the GMS. Much of the GMS final produce are manufactured using Chinese primary and intermediate inputs, which again get sold back to China. In fact, most of the trade between China-Thailand and China-Viet Nam include trade in the capital goods sector. Chinese imports are used for producing final manufactured items such as office machines, electric machines, road vehicles, and white goods, like, mobile phones, air conditioners, computers, and televisions. Most of the office machines and electrical machineries that Thailand exports, and most of the motorcycles that Viet Nam sells are made with Chinese machinery inputs. Similarly, most of the garment manufacturing units in Myanmar, Laos, and Cambodia, use Chinese textile and woven fabrics.

5. CONCLUSION

Our results provide evidence in support of location substitution effect hypothesis. This may be because of an increase in vertical intra-industry trade between China and the GMS countries, involving back-and-forth transaction in vertically fragmented cross-border production process. Instances, such as in the case of white goods, and garments, suggest that GMS countries are exporting finished items to China, that are increasingly getting manufactured using primary and intermediate inputs imported from China. As a result of higher cost of producing in mainland China (resulting from higher labor, land, and energy prices), and Chinese exports getting increasingly targeted by its major trading partners, Chinese firms are expanding their production base outside China. By shifting to cheaper overseas destination such as in GMS countries, Chinese firms are circumventing protectionist measures targeted against its exports. The integration with GMS comes naturally, because of closer proximity to mainland China, better policy coordination among the governments of the GMS countries, and availability of similar technology to replicate medium technology products outside mainland China.

¹⁰⁾ For a detail analysis about direction of China-GMS trade flow see Banik (2011).

Acknowledgement

The authors would like to thank Pradeep Srivastava, T.N. Srinivasan, and Rajeswari Sengupta, for comments on an earlier draft of this paper. The authors would also like to thanks, Mia Mikic, Ed Tower, and other participants at the WTO Research Workshop on Emerging Trade Issues in Asia and the Pacific : Meeting contemporary policy challenges, organized by UNESCAP, Thailand. The usual disclaimer applies.

REFERENCES

- Amiti, M. and C. Freund (2008). The Anatomy of China's Export Growth, *World Bank Policy Research Working Paper* 4628.
- Anderson, J. E. and E. van Wincoop (2004). Trade Costs, *Journal of Economic Literature*, 42: 691-751.
- Ando, M. (2006). Fragmentation and Vertical Intra-industry Trade in East Asia, *North American Journal of Economics and Finance*, 17: 257-281.
- Arellano, M. and S. R. Bond (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations, *Review of Economic Studies*, 58: 277-297.
- Banik, N. (2011). China's New Found Love: The GMS, *Journal of World Trade*, 45: 1037-1057.
- Blundell, R.W. and S.R. Bond (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models, *Journal of Econometrics*, 87: 115-143.
- Castellani, D., F. Serit and C. Tomasi (2010). Firms in International Trade: Importers' and Exporters' Heterogeneity in Italian Manufacturing Industry, *The World Economy*, 33: 424-457.
- Chen, M. X. and M. O. Moore (2010). Location Decision of Heterogeneous Multinational Firms, *Journal of International Economics*, 80: 188-199.
- Chit, M. M., M. Rizov and D. Willenbockel (2010). Exchange Rate Volatility and Exports: New Empirical Evidence from Emerging East Asian Economies, *The World Economy*, 33: 239-263.
- Côte, A. (1994). Exchange Rate Volatility and Trade, Bank of Canada Working Paper, No. 94-5, Bank of Canada, Ottawa.

- Devonshire-Ellis, C. (2011). China Now Has Third Highest Labor Cost in Emerging Asia, *China Briefing*, January 19.
Available on the web: <http://www.china-briefing.com/news/2011/01/19/china-near-top-of-the-list-for-wage-overheads-in-emerging-asia.html>, Accessed April 21, 2011.
- Fukao, K., H. Ishido and K. Ito (2003). Vertical Intra-industry Trade and Foreign Direct Investment in East Asia, *Journal of the Japanese and International Economics*, 17: 468-506.
- Gaulier, G., F. Lemoine and D. Unal-Kesenci (2007). China's Emergence and the Reorganisation of Trade Flows in Asia, *China Economic Review*, 18: 209-243.
- He, W. and M. A. Lyles (2008). China's Outward Foreign Direct Investment, *Business Horizons*, 51: 485-491.
- Helpman, E. (2006). Trade, FDI and Organization of Firms, *Journal of Economic Literature*, 44: 589-630.
- Hummels, D., J. Ishii and K. Yi. (2001). The Nature and Growth of Vertical Specialization in World Trade, *Journal of International Economics*, 54: 75-96.
- Koopman, R., Z. Wang and S. Wei (2008). How much of Chinese Exports is Really Made in China? Assessing Domestic Value Added when Processing Trade is Pervasive, NBER Working Paper No. 14109, Cambridge, MA.
- Lall, S. (1998). Export of Manufactures by Developing Countries: Emerging Patterns of Trade and Location, *Oxford Review of Economic Policy*, 11: 54-73.
- Lall, S. (2000). The Technological Structure and Performance of Developing Country Manufactured Exports, 1985-98, *Oxford Development Studies*, 28: 337-369.
- Levin, A., C. Lin, and C. Chu (2002). Unit Root tests in Panel Data: Asymptotic and Finite Sample Properties, *Journal of Econometrics*, 108: 1-24.
- Leamer, E. and R. M. Stern (1970). *Quantitative Empirical Economics*, Boston, MA: Allyn and Bacon.

- Li, S. and J. He (2007). Excess Liquidity Control Requires a Multi-pronged Approach, *China Economist*, September, 1: 19-29.
- Linneman, H. (1966). *An Econometric Study of International Trade Flows*, Amsterdam: North Holland.
- Magee, S. P. (1975). Price, Income and Foreign Trade: A Survey of Recent Economic Studies, in P. B. Kenen (ed.), *International Trade and Finance: Frontiers for Research*, Cambridge: Cambridge University Press.
- Poyhonen, P. (1963). A Tentative Model for Volume of Trade between Countries, *Welwirtschaftliches Archiv*, 90: 93-99.
- Tenreyro, S. (2007). On the Trade Impact of Nominal Exchange Rate Volatility, *Journal of Development Economics*, 82: 485-508.
- Tinbergen, J. (1962). *Shaping the World Economy: Suggestions for an International Economic Policy*, New York: Twentieth Century Fund.
- Yu, X. (2007). The Pattern of Exchange Rate Effects on Chinese Prices, *Review of International Economics*, 14: 683-699.
- Zhang, C. (2009). Excess Liquidity, Inflation and Yuan Appreciation: What can China Learn from Recent History?, *The World Economy*, 32: 998-1018.

APPENDIX

Commodity Classification

A. Primary and Resource Based

- 00 Live animals other than animals of division 03
- 01 Meat and meat preparations
- 02 Dairy products and birds' eggs
- 03 Fish (not marine mammals), crustaceans, molluscs and aquatic invertebrates, and preparations thereof
- 04 Cereals and cereal preparations
- 05 Vegetables and fruit
- 06 Sugars, sugar preparations and honey
- 07 Coffee, tea, cocoa, spices, and manufactures thereof
- 08 Feeding stuff for animals (not including milled cereals)
- 09 Miscellaneous edible products and preparations
- 11 Beverages
- 12 Tobacco and tobacco manufactures
- 21 Hides, skins and fur skins, raw
- 22 Oil-seeds and oleaginous fruits
- 23 Crude rubber (including synthetic and reclaimed)
- 24 Cork and wood
- 25 Pulp and waste paper
- 26 Textile fibres (other than wool tops and other combed wool) and their wastes (not manufactured into yarn or fabric)
- 27 Crude fertilizers, other than those of division 56, and crude minerals (excluding coal, petroleum and precious stones)
- 28 Metalliferous ores and metal scrap
- 29 Crude animal and vegetable materials, n.e.s.
- 32 Coal, coke and briquettes
- 33 Petroleum, petroleum products and related materials
- 34 Gas, natural and manufactured
- 35 Electric current
- 41 Animal oils and fats

- 42 Fixed vegetable fats and oils, crude, refined or fractionated
 43 Animal or vegetable fats and oils, processed; waxes of animal or vegetable origin; inedible mixtures or preparations of animal or vegetable fats or oils, n.e.s.

B. (Industrial) Intermediate and Machinery

- 51 Organic chemicals
 52 Inorganic chemicals
 53 Dyeing, tanning and colouring materials
 54 Medicinal and pharmaceutical products
 55 Essential oils and resinoids and perfume materials; toilet, polishing and cleansing preparations
 56 Fertilizers (other than those of group 272)
 57 Plastics in primary forms
 58 Plastics in non-primary forms
 59 Chemical materials and products, n.e.s.
 64 Paper, paperboard and articles of paper pulp, of paper or of paperboard
 65 Textile yarn, fabrics, made-up articles, n.e.s., and related products
 67 Iron and steel
 69 Manufactures of metals, n.e.s.
 71 Power-generating machinery and equipment
 72 Machinery specialized for particular industries
 73 Metalworking machinery
 74 General industrial machinery and equipment, n.e.s., and machine parts, n.e.s.
 75 Office machines and automatic data-processing machines
 76 Telecommunications and sound-recording and reproducing apparatus and equipment
 77 Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical counterparts, n.e.s., of electrical household-type equipment)
 78 Road vehicles (including air-cushion vehicles)
 79 Other transport equipment
 81 Prefabricated buildings; sanitary, plumbing, heating and lighting fixtures and fittings, n.e.s.
 87 Professional, scientific and controlling instruments and apparatus, n.e.s.
 89 Miscellaneous manufactured articles, n.e.s.

C. Final Manufactured Goods

- 61 Leather, leather manufactures, n.e.s., and dressed furskins
 62 Rubber manufactures, n.e.s.

- 63 Cork and wood manufactures (excluding furniture)
 - 66 Non-metallic mineral manufactures, n.e.s.
 - 68 Non-ferrous metals
 - 82 Furniture, and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings
 - 83 Travel goods, handbags and similar containers
 - 84 Articles of apparel and clothing accessories
 - 85 Footwear
 - 88 Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks
-

All SITC codes except 91, 93, 96 and 97 are included in the analysis.

Source : SITC is provided by United Nations Statistics Division, and is available at:
<http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=14>

IMPORT DATA of GMS Countries from China(US\$)

	year	Primary	Intermediate & Machinery	Final
Laos	2000	6328186	2608	89876
	2001	7322958	113602	21489
	2002	9441171	8305	199885
	2003	11022891	27300	151656
	2004	12413597	64107	176399
	2005	17870506	89126	7053824
	2006	43429944	806755	5410056
	2007	64186448	2751629	18980901
	2008	107171726	2787091	24299944
	2009	325771084	3685068	37863031
Thailand	2000	1267996345	2881146751	231642811
	2001	1368762379	3081650725	263435038
	2002	1388832285	3855563323	355201163
	2003	2140223842	6152668228	533909831
	2004	2695086328	8154402121	690932524
	2005	2865736624	10419457594	706410949
	2006	3880020610	13023224983	1059182417
	2007	4615189283	16727859059	1322676370
	2008	5683699058	18533337702	1439674840
	2009	4830062756	18434634724	1632231888
VietNam	2000	859671663	57587810	11887665
	2001	925203473	67918798	17663392
	2002	991060697	95112706	29718341
	2003	1192930428	162207431	101570235
	2004	2079289800	228972130	173726732
	2005	2095601899	274355999	182880047
	2006	1802726365	409517128	273832807
	2007	2238755919	641227901	346297005
	2008	2811130823	1037605487	487581160
	2009	2939542377	1329399799	477797616

	2000	8329709	7036	51153972
	2001	9431431	552863	24820014
	2002	10168139	213782	14167814
	2003	13615118	3530483	8855821
Cambodia	2004	14195736	9529994	6206167
	2005	13048254	9317709	4938957
	2006	24149729	7737862	3203764
	2007	38783465	7388224	4894190
	2008	26766400	926452	11135331
	2009	24081166	937191	11873794

EXPORT DATA of GMS Countries to China(US\$)

	Year	Primary	Intermediate & Machinery	Final
Laos	2000	2264072	28930770	3082047
	2001	1845695	49183025	3381201
	2002	2054476	49899954	1867004
	2003	1885674	93390053	2708801
	2004	1459658	78652927	7045876
	2005	2300694	95776211	5299563
	2006	3397736	156392409	8348457
	2007	3521943	153548325	7047860
	2008	5484168	253665026	8014945
	2009	10919649	321276221	40804119
Thailand	2000	339881961	1756864960	142003535
	2001	165170107	2001603107	166154717
	2002	226236266	2521923693	203194792
	2003	322946311	3171932014	319551479
	2004	370331243	4843170149	572135103
	2005	393149296	6684806769	690810626
	2006	441283633	8321635182	958618355
	2007	720243146	10000209787	1310078333
	2008	1010320267	12958740595	1666648074
	2009	1091610523	10820357490	1394024427
Viet Nam	2000	304302733	1131914218	101017166
	2001	352267603	1332217898	113289698
	2002	598643143	1346751995	202985317
	2003	1048893875	1812868842	320793044
	2004	899782686	2944437283	415655446
	2005	1257026675	3904406595	482435737
	2006	1188581927	5670434711	595892001
	2007	1315172040	9706309037	870797267
	2008	1780851256	12088022000	1244849464
	2009	2652244307	11788629915	1835508138

	2000	9384766	132655884	22023623
	2001	12126996	168755729	23061780
	2002	8644767	215052528	27432217
	2003	7222388	255037406	32354419
Cambodia	2004	29142002	383500205	39101077
	2005	29102707	449301064	57340420
	2006	23520721	597670182	76318354
	2007	23908628	772881504	86428202
	2008	40187393	930674927	121997850
	2009	28149428	793198866	85415825
