Abstract

Attracting foreign direct investment (FDI) and expanding external trade are the cornerstones of China’s open policy and have contributed to the remarkable economic growth of the country in the past three decades. The “FDI-trade nexus”, under which foreign-invested enterprises carry out international division of labour, is considered in the literature to be a key engine behind the burgeoning trade in East Asia. In this paper, we investigate whether such a view applies to China throughout its reform period. In particular, the changing importance of different forms of processing trade is examined. We focus on Guangdong as China’s most open province. The roles of FDI and the policies adopted by the government in restructuring these forms of trade are analysed.

1. Introduction

China has the largest population in the world. Theoretically it possesses great potential for domestic consumption. Nevertheless, after nearly thirty years of inward-oriented socialist experiments, the Chinese authorities decided to embark on reforms and open policies in the late 1970s. The size of the Chinese markets attracted foreign investors as the government started to implement a series of measures in promoting investments from outside and in encouraging exports. China is now the largest exporter of goods and recipient of foreign direct investment (FDI) among developing countries. Therefore, FDI and export have been considered to be the engines of growth to the Chinese economy. Utilised FDI and the total value of export increased by more than 30 times and 20 times respectively from 1987 to 2007.

2. FDI-trade nexus: theory versus facts

Historically, East Asian trade has been driven by what Kawai (2004) calls the “FDI-trade nexus”, under which the formation of regional supply chains by multinational corporations is assumed to be the key. Specialization and fragmentation of production sub-processes in different areas based on comparative advantage –
factor proportions and technological capabilities – then increase trade among them. This strategy is consistent with the “new regionalism” that Tsang (2008) discusses. It has induced vertical intra-regional and intra-industry trade in East Asia. Of course, there is a competitive element in that the countries and territories are trying to attract as much FDI as possible and the pattern of regional division of labour is not fixed.

Similar views are put forth by Wong and Chan (2003). Sussangkarn (2004) finds evidence of strong competitiveness between Thailand and China in their external trade. Detailed analyses of empirical data cover, other than prima facie trends of China’s relative rise and Thailand’s relative decline especially after the East Asian financial crisis, the latter’s RCA (revealed comparative advantage) rank correlations with various countries (including China) and its rank correlations with China within different product groups. Based on these findings, Sussangkarn (2004) emphasizes the need for ASEAN countries to improve their competitiveness so as to attract more FDI especially from Japan, which has a more complementary trade and investment structure with Thailand as well as an already significant production and investment presence.

Does this view of “FDI-trade nexus” apply to China in its external economic relations with the rest of the world? Has China been just another recipient of FDI, like those in East Asia? Our answer is not quite, largely because of the uneven pace of China’s process of opening to the rest of the world. Two different sub-periods are notable to us.

In the earlier period of reform, most FDI came from Hong Kong, which made use of the low cost environment in China. The enterprises were largely SMEs. Bigger companies tend to invest in infrastructure, property and services (e.g. hotels). China was running trade deficits for the majority of years.
The situation changed after mid-1990s, as testified by the following three charts. Other sources of FDI entered China and the country became an outward processing hub not just for Hong Kong, but for the rest of the world, including Taiwan, Japan, Europe and the US. The pace picked up after WTO accession in 2001. Only since then China has been recording increasing trade surpluses, which directly contributed to GDP growth.
3. Hypotheses of two sub-periods

Based on the above observations, our hypotheses are as follows:

H1: FDI and export are not interrelated in the first stage of reform (1978-1998).

H2: FDI and export are interrelated in the second stage of reform (1999-2006).

We use empirical tests to verify our scepticism, involving Vector Auto-Regression (VAR) Models. Variables include utilised FDI, GDP and total export in real terms for three different spans of time: (1) The whole reform period: 1978 – 2006; (2) Sub-period 1: 1978 – 1998 (Annual Data); and (3) Sub-period 2: 1999 – 2006 (Quarterly Data).

The breakpoint 1999 is chosen because of (a) the positive anticipatory impact of China joining the WTO (eventually in 2001) and (b) data constraints. VAR models have been adopted to determine the dynamic relations of the three variables. The lag lengths are chosen according to the AIC criteria. Cointegration and VAR Granger causality tests are also applied to the models.

Quarterly data have been seasonally adjusted and all the data are in natural log form. Both types of data should undergo the unit root test before further analyses. That test is employed to verify the stationarity {I(0) or otherwise I(1) or above} of the various time series. A series is said to be stationary if the mean and the autocovariances of the series do not change over time. (Studenmund, 2006) The VAR technique should only be applied to series which are integrated of the same order.

The Augmented Dickey Fuller (ADF) Test is used to infer the number of unit
roots in each of the variables. If the variables are integrated of the same order, e.g. I(1), then we can go to the second step. If the absolute value of ADF t-statistic of one variable is greater than the 5% significance level, the variable is stationary \{I(0)\}. Otherwise, it is non-stationary \{I(1) or above\}. Adjustments then need to be made. The Schwarz information criterion (SIC) is the tool to determine the best lag length in the unit root test. The test results are shown below: all the variables in our models turn out to be I(1).

**Unit Root Test Report**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Variable Name</th>
<th>H0: I(1) (Level)</th>
<th>H1: I(2) (1st difference)</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual</td>
<td>lnfdi</td>
<td>-2.890727</td>
<td>-4.740498**</td>
<td>I(1)</td>
</tr>
<tr>
<td></td>
<td>lngdp</td>
<td>-0.565043</td>
<td>-4.180505**</td>
<td>I(1)</td>
</tr>
<tr>
<td></td>
<td>lnex</td>
<td>-0.670490</td>
<td>-6.137662**</td>
<td>I(1)</td>
</tr>
<tr>
<td>Quarterly</td>
<td>lnqfdisa</td>
<td>-1.224232</td>
<td>-2.937180**</td>
<td>I(1)</td>
</tr>
<tr>
<td></td>
<td>lnqgdpsa</td>
<td>1.110414</td>
<td>1.964784**</td>
<td>I(1)</td>
</tr>
<tr>
<td></td>
<td>lnqexsa</td>
<td>0.915013</td>
<td>-2.069706**</td>
<td>I(1)</td>
</tr>
</tbody>
</table>

P.S: **: Significant at the 5% level

4. Empirical results on the two sub-periods

Given the test results, we carry on with the VAR models. We are interested in whether foreign direct investment and export were always positively related in China. We first use the annual data from 1978 to 2006 in order to test if we should have different sub-periods. Variance decomposition exercises have been performed. The optimal lag is, as said, based on the AIC criterion.

The results for (1), i.e. the whole period, cast doubts on the FDI-trade nexus as FDI did not Granger cause export:

So we move to the models for the two sub-periods. Findings for the first sub-period (1978-1998) indicate the lack of any inter-connection between FDI/GDP and export, confirming our scepticism.
Results for the second sub-period (1999-2006) using quarterly data are more positive, providing support for the “nexus” view:

These results confirm our hypothesis of the two sub-periods for China’s peculiar developments in attracting FDI and promoting external trade. One key feature, as we argued above, is the changes in the roles and contributions of different types of processing trade, which we proceed to investigate.

5. General versus processing trade in China

China’s external trade consists of two major types (1) general trade (一般贸易) and (2) processing trade (加工贸易), which dominate other less important categories particularly in recent years. Contrary to the investment-trade nexus hypothesis and consistent with our findings above, processing started to overtake general trade only in 1995. Moreover, processing trade has been the major factor in generating China’s trade surpluses since then.
Processing trade has been developing since the launch of the reform, gaining faster momentum since the 1990s after promotional policies by the State Council. It has mainly been performed by foreign-invested enterprises rather than state owned enterprises (SOEs), as the following diagram shows. In 2006, about 85% of processed exports came from foreign-invested enterprises. The proportion of FIEs in processing trade increased from 21.3% in 1988-1990 to 78.6% in 2001-2005, by more than three times.
6. Major Types of Processing Trade

According to the China Customs, processing trade divided into two major types which are processing and assembly trade provided with raw materials (來料加工—PA) and processing trade of imported materials (進料加工—PIM). (Lu, Hu, Li..., 2005)

Processing & Assembly Trade provided with Raw Materials (PA) refers to the operation of using imported materials supplied by the overseas enterprises, processing or assembling products according to the requirements given by those enterprises, and then charging processing fees only. Overseas enterprises supply the materials and the machineries to the processing factories. The processing factories are only responsible for processing or assembling and receive the processing fees for return. The processing factories are not responsible for purchasing the inputs for production and are independent of the profit and loss of the foreign enterprises. The characteristic of PA is that there is no technology transfer through processing, and the foreign enterprises just take advantage of the lower production cost in China with abundant labour and land supplies. The enterprises of PA operation are not allowed to run domestic sales business and general trade.1

Besides, PA trade enjoys tax incentives which make its operation more attractive to foreign enterprises. The incentives include zero tariffs and exemption from the value-added taxes for imported materials and machineries that are used in production as well as the export tax on finished products. For the processing factories, they also do not have to pay value-added taxes and sales taxes on the processing fees.

Processing Trade of Imported Materials (PIM) refer to the operation that an foreign-invested enterprise needs to import raw materials, supplementary materials, parts, components, and packing materials using foreign exchange and then, after processing, exports the finished or semi-finished products. The main characteristic is that the foreign-invested enterprise shoulders the sole responsibility for its own profits and losses. It needs to purchase the materials used for production using foreign currencies, and make decision on production and sales. Also, all the materials, machineries, finished or semi-finished products are owned by the foreign-invested enterprises. PIM trade also enjoys tax premium but it is not fully tax-free. Taxes have to be paid on imported materials and machineries but there is a tax rebate system for exported products. The value added of PIM tends to be greater than PA.

7. Processing Trade Development

According to Hong Kong Trade Development Council, processing trade can be defined as “the business activity of importing all or part of the raw and auxiliary materials, parts and components accessories, and packaging materials from abroad in bond, and re-exporting the finished products after processing or assembly by

enterprises within the mainland

In the era of globalization, the growth of processing trade can be explained by the further development of international division of labour. Processing trade is important in its contribution to the industrialization of China’s economy. The development of the processing trade can be divided into three stages on the basis of the changing relative importance of the two major types of processing trade – PA and PIM. (Yeung, 1999)

The first stage refers to the period from the early years of reform to the middle of the 1980s. (Yeung, 1999) Processing trade was dominated by PA which was mainly labour-intensive. At the beginning of reform, the level of economic development of China was still low. Supplies of domestic raw materials and foreign exchange suffered from shortage. (Lu, Hu, Li.., 2005) Therefore, PA prevailed with the aim of earning processing fees only. Besides, the Chinese internal market was still relatively closed. The outputs of PA were not allowed to be sold inside the country.

The second stage refers to the period from 1988 to 1991. (Yeung, 1999) PIM started to become more important and dominated later. In 1989, the total value of trade of PIM first exceeded those of PA and accounted for 53% to national total value. (Kwok, 2006) The Chinese government implemented promotional policies for developing PIM especially for attracting the foreign capital from Hong Kong, Taiwan, South Korea and Singapore. (Kwok, 2006)

The third stage refers to the period from 1992 up to now. (Yeung, 1999) PIM still dominated in the export trade. The following diagram shows that the difference between the proportions of PIM and PA has been becoming larger over time. The share of PIM is about four times of that of PA in 2006. From 1988 to 2006, the share of PIM increased from 44.7% to about 81%; but that of PA decreased from 55.3% to about 19%.

Total Export by Types of Processing Trade 1997 - 2006
(Source: China Customs Statistics)

![Graph showing Total Export by Types of Processing Trade 1997 - 2006](http://www.tdctrade.com/chinaguide/eng/02/2-3.pdf)


3 Source: data before 1998 from (Kwok, 2006) and data to 2006 from China Customs Statistics Yearbook 2006.
The Chinese government has paid great attention to promoting and attracting FDI especially the multinational companies. However, in recent years it aimed at not only attracting capital inflows but also technologies transfer. With fast development of processing activities, the authorities have come to the view that such a form of trade needs to be upgraded to higher value-added production with more technological contents. Hence, policies have been implemented to encourage hi-tech processing trade and to discourage the further expansion of low value-added processing such as most of PA trade. Therefore, PIM has become more important in the latest stage.

8. The Case of Guangdong in Developing Processing Trade

Guangdong has been the foremost among China’s provinces in attracting FDI and promoting external trade, with the initial three special economic zones (SEZs) located in it. Hence we use it as the most important example to investigate changing roles of the two different forms of processing trade.

![China and Guangdong’s Export by Trade Mode 1984 and 2006](Source: China Statistical Yearbook and Guangdong Statistical Yearbook)

During the early stage of the reform, PA had the dominant role in the contribution to Guangdong’s exports. Guangdong took about 80% of the national total in processing fees which was equivalent to 20.5% of the province’s net total foreign exchange earnings. In 1984, PA generated 80% of the total processing export but it dramatically decreased to 42% in 1994. The total value of PIM export was only USD 0.073 billion in 1984, but it rose by about 290 times in 1994. The gap between the two types of processing trade became greater in the late 90s and even more so in recent years. In 2006, PIM contributed about 79% to processing trade export which amounted to for USD 165.166 billion but PA was only valued at USD 43.218 billion.
External investors, especially those from Hong Kong, played an important role in processing trade in Guangdong. The close relationship between Guangdong and Hong Kong can be explained by their geographical proximity and linguistic and cultural similarities. Before the Open Policy, Hong Kong acted as middleman between China and the world. It was “China’s window to the world and also the gate for foreign investors entering China.” (Zeng, 2000)

The following diagram shows the total export by the types of enterprises and testifies to the importance of the role of foreign invested enterprises in the province.
In the early age of reform, most of the Hong Kong investors were engaged in PA, which did not legally generate direct investment. Hong Kong investors aimed at lowering their production cost by shifting their production to the Mainland. In the later stage of reform, as the Chinese government implemented upgrading policies to reform the structure of processing trade, Hong Kong enterprises were affected. We will have more to say about this issue below.

9. Regression Model on Guangdong’s Processing Trade

To verify our reasoning, we construct a simple regression model on the growth contributions of different types of trade in the Guangdong province. It utilises data from 1985 to 2006. They have been adjusted by the price level and the exchange rate. The dependent variable is real GDP growth and the three independent variables are the changes in the balance of three trade modes, i.e. general trade, PA, and PIM. We use absolute values of all the data and do not take natural log because of the existence of some negative numbers in the trade balance (trade deficits). The model is as follows:

$$\Delta Y = f(\Delta NX_1, \Delta NX_2, \Delta NX_3)$$

$$\Delta Y_t = \alpha + \beta_1 \Delta GT_t + \beta_2 \Delta PA_t + \beta_3 \Delta PIM_t + \varepsilon_t$$

where

$\Delta Y_t$ = Real GDP growth in time $t$

$\Delta NX$ = Change in net exports in time $t$

$\Delta GT_t$ = Change in general trade balance in time $t$

$\Delta PA_t$ = Change in the balance of processing and assembly trade provided with raw
materials in time $t$

$\Delta PIM_t = \text{Change in the balance of processing trade of imported materials in time } t$

We come up with the following regression results with a WTO accession dummy (1999-2006):

**Regression Results**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>t-statistics</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>$C$</td>
<td>36.82394</td>
<td>4.231127</td>
<td>***</td>
</tr>
<tr>
<td>$\Delta GT_t$</td>
<td>0.513132</td>
<td>3.168077</td>
<td>***</td>
</tr>
<tr>
<td>$\Delta PA_t$</td>
<td>-0.223397</td>
<td>-0.257783</td>
<td>--</td>
</tr>
<tr>
<td>$\Delta PIM_t$</td>
<td>1.392676</td>
<td>3.062384</td>
<td>***</td>
</tr>
<tr>
<td>$D(WTO)$</td>
<td>73.25636</td>
<td>4.566123</td>
<td>***</td>
</tr>
<tr>
<td>$R^2$</td>
<td></td>
<td>0.865375</td>
<td></td>
</tr>
<tr>
<td>A-$R^2$</td>
<td></td>
<td>0.733698</td>
<td></td>
</tr>
<tr>
<td>DW</td>
<td></td>
<td>1.558497</td>
<td></td>
</tr>
</tbody>
</table>

***, **, * Significant at the 1% level, 5% level & 10% level

These results are consistent with our expectations. They suggest that the change in the general trade balance contributed positively to real GDP growth, but not as much as that in the balance in PIM. This can be explained by the fact that although there has been an increasing trend of general trade, it is still of only secondary importance compared with processing activities in Guangdong (see the diagrams on the modes of trade above).

Within the two forms of processing trade, the estimated coefficient of the change in PA balance shows the wrong sign and is statistically insignificant. It is a testimony to the observation that PA has been losing its driving force after Guangdong entered into a more mature phase of development, as the province aimed at not just earning processing fees but also inducing technology transfer and high-tech investment inflows. The coefficient on the change in PIM balance turns out to be significant statistically and economically, in line with the developments there. Foreign invested enterprises which are more sophisticated would pay attention to the huge potential in domestic sales within China other than the export market. They can only do so if they move away from PA to PIM.

### 10. Restructuring policies on processing trade

From the above discussions on both China as a whole and Guangdong in particular, FIEs have been playing a vital role in processing trade, facilitated by government policies. Although PA is still making some contribution, the authorities have been keen in carrying out trade reforms and upgrading in the Eastern region, including Guangdong.
The two key policy measures in recent years involve: (1) Restriction of categories of PA and the guarantee deposit system (保證金台帳制度) and (2) Tax Rebate System (出口退稅).

10.1 Restriction of categories of PA and the guarantee deposit system

The system of guarantee deposit is a compulsory cash deposit scheme with the objective of monitoring enterprises which operate processing and assembly trade (PA) and ensuring that they do not use the imported materials for any other purposes than adding them to the final exports. The enterprises need to pay the cash deposit which equals to the value-added tax and tariffs of imported materials. After the processed products are all exported as certified by the Customs, the guarantee deposit will be refunded.4

The guarantee deposit system was established in 1995 when the enterprises only had to open a bank account for guarantee deposit but didn’t actually need to deposit money into it i.e. it was an idle account (空轉). (Lu, Hu, Li,, 2005) In 1999, the Chinese Customs issued the No.71 Injunction5 on classification management of the guarantee deposit system, under which enterprises were divided into four groups. (Lu, Hu, Li,, 2005) The division of groups was based on the performance of the processing enterprises in business and in obeying law.6 Besides, the nature of the commodities produced and imported were also under consideration in applying different treatments for guarantee deposits.7

Commodities were classified as prohibited, restricted and authorized commodities. Prohibited commodities could only be imported or exported through the form of general trade. The idle account system was applied to Group A enterprises regarding both restricted and authorized commodities. Group B enterprises could enjoy the idle account system on the authorized commodities, but they had to put in 50% of guarantee deposit for restricted commodities. Group C and D enterprises faced the full deposit requirement i.e. to have a real account (實轉). According to the China Customs, many Group C and D enterprises had records of breaking laws and rules on processing trade and exports. (Lu, Hu, Li,, 2005)

The proportion of guarantee deposit did not only increase the financial burdens and operation difficulties of the enterprises but, more importantly, affect their liquidity.

In August 2007, China Customs and the Ministry of Commerce made the Issue 44 Announcement on the restricted catalogue of processing trade, which was expanded.8 Also, even Group A and B enterprises were required to pay 50%
guarantee deposit on restricted commodities. Group A enterprises had been exempted previously but no longer so under the new rules. However, the new policy was implemented for enterprises in the Eastern region only. The implication was that the Chinese government aimed to shift the centre of processing and assembly trade to the Central and Western regions, where Group A and Group B enterprises would still enjoy the idle account system.

According to the questionnaire survey conducted by the Hong Kong Trade Development Council, 55.3% of the interviewed enterprises indicated that the new guarantee deposit system led to huge burden for them regarding working capital requirements.9

There is no doubt that the changes in the guarantee deposit system have generated greater impact on small and medium enterprises (SMEs) than on large enterprises as the former usually do not have enough circulating funds. They are essentially forced either to upgrade to PIM or general trade; or move their operations to the Central and Western regions.

10.2 Tax Rebate System

In order to promote exports, the Chinese government began to implement the tax rebate system in 1985. The main objective of offering tax rebates is to lower the cost of exported products and strengthen their competitiveness in the world market. (Wong, 2003). The rebate is a refund to the value-added tax and consumption tax that have already been paid for domestic production, processing and sales. (Lian, 2002) Only products which are included in the value-added tax and consumption tax bundle and exported can have rebates. (Lian, 2002) With the implementation of the system, the total value of exports increased from RMB 80.89 billion in 1985 to RMB 2202.44 billion in 2001, while tax rebates amounted to RMB 1.98 billion in 1985 and RMB 107 billion in 2001. (Wong, 2003)

According to the Hong Kong Trade Development Council, the rebate rates had been changed many times.10 The growth rate of exports fluctuated quite widely in China within the period of 1986 to 2007. This may be partly explained by the government’s policy on rebates.

In September 2006, the Ministry of Finance, the Development and Reform Commission, the Ministry of Commerce, the General Administration of Customs, and the State Taxation Administration of China jointly promulgated the Circular on the Adjustment of the Export Tax Reimbursement of Some Commodities and the Supplement of Restricted-Type Commodity Catalogue in Processing Trade11. The adjustment included cancelling, reducing or raising tax rebates on selected commodities with the aim of transforming the structure of processing trade from low-tech production to high-tech production.
According to the document\textsuperscript{12}, tax rebates were cancelled for some raw materials and related products e.g. minerals and woods and their products. Rebates for some commodities, mainly raw materials and low-tech products, were reduced by at least 2\%. However, rebates for some products with high value added were raised, e.g. the rates for hi-tech products, IT products and medical products rose from 13\% to 17\%.

In June 2007, the Chinese government announced another package of adjustments to the tax rebate rates. It further eliminated rebates for commodities of high energy consumption, high pollution effect and which are resource related (兩高一資).\textsuperscript{13} As examples, the rebates for plastic materials and related products were lowered from 11\% to 5\%; while those for leather and related products were cancelled.\textsuperscript{14}

The Hong Kong Trade Development Council reported the concern of FIEs under the double changes in the guarantee deposit and tax rebate systems. The Chairman of Taiwan’s Enterprises Association in Guangzhou City indicated that the reduction in tax rebates and the hike in the proportion of guarantee deposit had great impact on production cost. However, only 20\% of the enterprises had the ability to transfer the additional costs to customers. Many of them would be forced to close down or move out from the Eastern region. (Li, 2007)

11. Concluding remarks

Attracting foreign direct investment (FDI) and expanding external trade are widely recognized to be the major driving forces behind China’s open policy, in the context of its remarkable economic growth.

The view of the “FDI-trade nexus” in East Asia, under which foreign-invested enterprises (FIEs) are supposed to carry out international division of labour and thereby drive external trade, has been accepted by many researchers. Our institutional and empirical investigations find it to be wanting. Two different stages of FDI-trade-GDP relations are identified. China’s development has followed its own logic, with FDI relatively unrelated to net exports before the 1990s. However, in more recent years, especially after WTO accession in 2001, the “nexus” theory appears to yield more empirical support.

In any case, for the benefit of the longer term prospect of the country, the Chinese government has been implementing policies to upgrade its trade structure and to change the roles of different forms of processing trade.


\textsuperscript{14} The No.90 Paper – the Circular on the Adjustment of the Export Tax Reimbursement of Some Commodities, released on June 20, 2008: http://cws.mofcom.gov.cn/aarticle/ckts/ckzcfg/200706/20070604800549.htm
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