

## ***Research Report***

# **Export Expansion in the People's Republic of China since 1978: A Case Study of the Pearl River Delta\***

Becky P. Y. Loo

**ABSTRACT** Against the background of a complex and evolving statistical system, this article addresses three crucial issues in the understanding of the rapid export expansion of China in general and the Pearl River Delta in particular. First, the export orientation of the Pearl River Delta is critically assessed. The gradual emergence of export-oriented firms in the region and their spatial clustering around Hong Kong are highlighted. Secondly, the structural dimension of export expansion in the region is examined. Foreign-invested enterprises were found to be the “engine of growth.” Lastly, an analysis of the spatial dimension of the foreign-invested enterprises’ export component reveals that the juridical status and geographical locations of exporting firms are complementary in providing a better understanding of export expansion in China since 1978.

On 11 November 2001, China’s 15-year long “marathon” to join the World Trade Organization (WTO) ended. In the near future, China’s foreign trade system is expected to undergo further reforms as the country strives to conform to the fair trade principles of WTO. At this historical juncture, the time is opportune to review the statistics, institutional framework and geographical dimension of export expansion in the country over the past two decades. The existing scenario constitutes the background for further reforms and hence, plays a key role in understanding subsequent changes. A case study of the Pearl (Zhu) River Delta (PRD) gives substantial insights about export expansion in the country since 1978. Three key issues are addressed in this article. First, the export orientation of the PRD is assessed by taking into account data quality and compatibility issues. Over time, there has been a gradual emergence of export-oriented firms in the PRD, highly clustered around Hong Kong. Secondly, the structural dimension of export expansion in the PRD is examined. In particular, the article addresses the question of whether exports by external processing, external assembly and compensation trade, or foreign-invested enterprises have made a greater contribution to export expansion. Finally, through an analysis of the spatial dimension of foreign-invested enterprise exports, the article re-examines the argument that geography is no longer important in understanding the export performance of China. It is suggested that juridical status, as elaborated in

\* The author acknowledges with thanks the financial support of the Hui Oi Chow Trust Fund.

the work of Naughton,<sup>1</sup> and the geographical location of exporting firms are equally important in understanding the export performance of China since 1978.

### *Export Orientation of the PRD*

Any analysis of the changing structural and spatial compositions of exports in the PRD will be affected by the choice of export statistics and any change in their definitions and/or accounting methods over the study period. In China, the phenomenal growth of exports in the region and its high export orientation have been commonly recognized.<sup>2</sup> Nevertheless, answering research questions about the degree of spatial agglomeration of exports in the PRD is not as straightforward and easy as it may seem. An attempt to examine PRD's exports after the open policy brings to light two notable methodological problems. First, export data at the county level were not released in provincial statistical yearbooks published by the Statistical Bureau of Guangdong. Any topical analysis about the export performance of the PRD (and its spatial composition) has to rely on special compilations<sup>3</sup> and assembled from different sources.<sup>4</sup> More importantly, only data from the Ministry of Foreign Trade and Economic Co-operation (hereafter the Ministry) were available from 1981 to 1994 and only National Customs (hereafter Customs) data were published from 1995 to 1999. Secondly, the administrative structure of the region has changed over time. From 1981 to 1994, Ministry export data were

1. See B. Naughton, "China's emergence and prospects as a trading nation," *Brookings Papers on Economic Activity*, No. 2 (1996), pp. 273–337.

2. See Xiaoping Deng, *Selected Works of Deng Xiaoping: Vol. 3 (1982–1992)* (Beijing: Foreign Languages Press, 1994); Lisong Ding, "The main target of special economic zone: developing outward-oriented economy," *Yearbook of China's Special Economic Zones* (n.p.: n.p., 1986); Zimen Jiang, "Speech on the working party of learning Deng Xiaoping's theories on 17 July 1998," in Research Office of Documents by CCP and CCP Fujian Committee Office (ed.), *Twenty Years of Reforms and Open Door: A Compilation of Important Documents* (Fujian: Fujian Education Press, 1998) (in Chinese).

3. From 1981 to 1994, the four major compilations are SBG, *Economic Statistics on Counties (Districts) in Guangdong Province 1980–1990* (Yichuan: Jiangxi Yichun Information Press, 1991); Chinese Communist Party Guangdong Committee Office (CCPGCO) and SBG, *Economic Statistics on the Zhujiang Delta 1980–1991* (n.p.: n.p., 1992); SBG and the Commercial Bank of China, Guangdong Branch, *Economic Statistics on Regions in Guangdong Province 1980–1993* (Yichuan: Jiangxi Yichun Information Press, 1994); CCPGCO and SBG, *Economic Statistics on the Zhujiang Delta 1980–1994* (n.p.: n.p., 1995). Since 1995, the data are mainly compiled from Statistical Bureaus of the 12 Municipalities in the Pearl River Delta, *Major Socio-economic Indicators of the 12 Municipalities in the Pearl River Delta (1999)* (Dongguan: Dongguan Municipal Statistical Bureau, 2000). In some circumstances, the data have been supplemented by county-level information published in municipality statistical yearbooks. These sources are Statistical Bureau of Huizhou, *Statistical Yearbook of Huizhou 2000* (Shenzhen: China Statistical Press, 2000); Statistical Bureau of Nanhai, *Statistical Yearbook of Nanhai 1999* (n.p.: n.p., 1999); Statistical Bureau of Panyu, *Statistical Yearbook of Panyu 2000* (Guangzhou: Guangdong People's Press, 2000); Statistical Bureau of Zhaoqing, *Statistical Yearbook of Zhaoqing 2000* (Yichuan: Jiangxi Yichun Information Press, 2000). However, not all municipalities in the PRD published statistical yearbooks under their administrations.

4. This is necessary because only selected benchmark years are published in some of these statistical compilations. Fortunately, a complete set of comparable figures can be obtained by assembling data from all these sources.

compiled based on 31 counties/municipalities.<sup>5</sup> Since 1995, Customs export data were compiled based on the 12-municipality administrative structure of the region. The changing administrative boundaries are shown in the Appendix. During the 1980s, the population and economic power of many counties in the PRD increased substantially. Consequently, these counties (formerly under the administration of municipal-level cities) were enlarged and granted higher administrative autonomy. Some notable examples were Panyu, Nanhai and Shunde, which were upgraded to municipalities in the early 1990s. Based on the division of the 12 municipalities in 1995, the boundary of the PRD has been enlarged. The size of the region increased from 47,455 km<sup>2</sup> (27 per cent of the provincial total) to 57,917 km<sup>2</sup> (33 per cent of the provincial total). What are the implications of these two methodological problems on an assessment of the export orientation of the PRD?

*The meanings of exports.* Table 1 lists the available export values of the PRD from 1981 to 1999. Apart from the spatial expansion of the PRD, a key question in any temporal analysis of export expansion in China is whether the Ministry and Customs data were consistent. Based on the official definitions, exports of the foreign trade system (Ministry exports) and exports crossing the national boundary (Customs exports) should diverge only slightly.<sup>6</sup> Under the foreign trade system in China, any enterprise exporting to a foreign country must report the export values on a free-on-board basis to the Ministry in advance. Before the open policy, only specially designated state agencies and foreign trade corporations (FTCs) in China had the rights to handle imports and exports. Therefore, Ministry exports consisted solely of exports by FTCs. With the trade liberation of the 1980s, the Ministry managed exports mainly through issuing import and export licences.<sup>7</sup> However, exporting enterprises were still required to report export values to the Ministry. This requirement was partly a legacy of the centrally planned economy and partly because of the foreign exchange controls in China.

Statistically, Ministry exports consisted of three major components. The first was exports by FTCs with export rights granted by the Ministry itself. Domestic enterprises might also export their products through these agencies; in fact, many were trading rather than manufacturing enterprises. In Chinese terminology, it was called ordinary trade (*maoyi chukou*) (OT). The second component of Ministry exports was external

5. The PRD included 31 counties/municipalities in Shenzhen, Zhuhai, Guangzhou and the PRD Open Economic Zone (OEZ). The 1987 boundary of the PRD OEZ is used (see Appendix).

6. The slight discrepancy between the Ministry exports and Customs exports existed because the latter also included "materials, supplies and gifts as aid given gratis between governments and by the United Nations and other international organizations." See State Statistical Bureau (SSB), *China Statistical Yearbook 1999* (Beijing: China Statistical Press, 1999).

7. Guangdong Foreign Economic Relations and Trade Committee (ed.), *50 Years of Guangdong Foreign Economic Relations and Trade* (Guangzhou: Guangdong Economy, 1999).

Table 1: A Comparison of Export Statistics in the PRD, Guangdong and China (1981–1999)

|      | China's exports                      |                                     |                     | Guangdong's exports                  |                                     |                     | PRD's exports                        |                                     |                     |
|------|--------------------------------------|-------------------------------------|---------------------|--------------------------------------|-------------------------------------|---------------------|--------------------------------------|-------------------------------------|---------------------|
|      | Ministry value<br>(100 million US\$) | Customs value<br>(100 million US\$) | Difference<br>Value | Ministry value<br>(100 million US\$) | Customs value<br>(100 million US\$) | Difference<br>Value | Ministry value<br>(100 million US\$) | Customs value<br>(100 million US\$) | Difference<br>Value |
| 1981 | 208.9                                | 220.1                               | -11.2               | 23.7                                 | —                                   | ...                 | 7.9                                  | —                                   | ...                 |
| 1982 | 218.2                                | 223.2                               | -5.0                | 22.6                                 | —                                   | ...                 | 8.4                                  | —                                   | ...                 |
| 1983 | 222.0                                | 222.3                               | -0.3                | 23.9                                 | —                                   | ...                 | 9.5                                  | —                                   | ...                 |
| 1984 | 244.2                                | 261.4                               | -17.2               | 24.9                                 | —                                   | ...                 | 9.7                                  | —                                   | ...                 |
| 1985 | 259.2                                | 273.5                               | -14.3               | 29.5                                 | —                                   | ...                 | 16.9                                 | —                                   | ...                 |
| 1986 | 270.1                                | 309.4                               | -39.3               | 42.5                                 | —                                   | ...                 | 24.7                                 | —                                   | ...                 |
| 1987 | 347.1                                | 394.4                               | -47.3               | 54.4                                 | 101.4                               | -47.0               | 38.9                                 | —                                   | ...                 |
| 1988 | 406.4                                | 475.2                               | -68.8               | 74.8                                 | 148.2                               | -73.3               | 50.4                                 | —                                   | ...                 |
| 1989 | 434.4                                | 525.4                               | -91.0               | 81.7                                 | 181.1                               | -99.5               | 53.8                                 | —                                   | ...                 |
| 1990 | 520.7                                | 620.9                               | -100.2              | 105.6                                | 222.2                               | -116.6              | 78.9                                 | —                                   | ...                 |
| 1991 | —                                    | 718.4                               | ...                 | 136.9                                | 270.7                               | -133.9              | 106.5                                | —                                   | ...                 |
| 1992 | —                                    | 849.4                               | ...                 | 184.4                                | 334.6                               | -150.2              | 158.3                                | —                                   | ...                 |
| 1993 | —                                    | 917.4                               | ...                 | 270.3                                | 373.9                               | -103.7              | 252.8                                | —                                   | ...                 |
| 1994 | —                                    | 1210.1                              | ...                 | 469.9                                | 502.1                               | -32.2               | 358.0                                | —                                   | ...                 |
| 1995 | —                                    | 1487.8                              | ...                 | 556.7                                | 565.9                               | -9.3                | —                                    | 548.2                               | ...                 |
| 1996 | —                                    | 1510.5                              | ...                 | 590.0                                | 593.5                               | -3.5                | —                                    | —                                   | ...                 |
| 1997 | —                                    | 1827.9                              | ...                 | 726.6                                | 745.6                               | -19.1               | —                                    | —                                   | ...                 |
| 1998 | —                                    | 1838.1                              | ...                 | 781.9                                | 756.2                               | 25.8                | —                                    | 721.7                               | ...                 |
| 1999 | —                                    | 1949.3                              | ...                 | —                                    | 777.1                               | ...                 | —                                    | 759.7                               | ...                 |

Notes:

— data not available

... not applicable

Sources:

Compiled from SBG, *Economic Statistics 1980-1990*; SBG, *Statistical Yearbook of Guangdong 2000*; SSB, *China Foreign Economic Statistical Yearbook 1997*; SSB, *China Foreign Economic Statistical Yearbook 2000*; CCPGCO and SBG, *Economic Statistics 1980-1991*; CCPGCO and SBG, *Economic Statistics 1980-1994*; SBG and the Commercial Bank of China, *Economic Statistics 1980-1993*; Statistical Bureaus of the 12 Municipalities in the Pearl River Delta, *Major Socio-economic Indicators 1999*; Statistical Bureau of Huizhou, *Statistical Yearbook 2000*; Statistical Bureau of Panyu, *Statistical Yearbook 2000*; Statistical Bureau of Nanhai, *Statistical Yearbook 1999*; Statistical Bureau of Zhaoqing, *Statistical Yearbook 2000* and Editorial Board of the Almanac of China's Foreign Economic Relations and Trade, *Almanac of China's Foreign Economic Relations and Trade 1992*.

processing, external assembly and compensation trade (*sanlai yibu*) (PAC). This category, being considered the most important component of exports in the PRD,<sup>8</sup> was also known as the “three comings-in and one compensation.”<sup>9</sup> The third component was exports by foreign-invested enterprises (*sanzi qiye*) (FIEs). Generally, FIEs refer to Sino-foreign joint equity, Sino-foreign joint contractual and wholly foreign-owned enterprises.

The second set of export data in China was released by the National Customs. Statistically, Customs exports encompass all transactions across the national boundary. In most foreign countries, exports simply refer to Customs exports.<sup>10</sup> Should there be no under-reporting by exporting firms to the Ministry and if all planned exports are materialized as reported, Ministry and Customs exports should differ only slightly.<sup>11</sup>

In reality, what was the magnitude of discrepancy between the Ministry and Customs exports? Over time, has the discrepancy remained at a similar level? If the two export data sets are broadly comparable, the fact that only Ministry or Customs data were available does not represent a major methodological challenge. Otherwise, special care must be taken to clearly distinguish and understand the different meanings of the data used to interpret the region's export orientation. In no year were the Ministry and Customs export statistics of the PRD available at the same time. Thus, we attempt to examine this data compatibility issue at the national and provincial levels, where the two export data sets co-existed (at least for some years). In Table 1, the Ministry and Customs data are juxtaposed at the national and provincial levels. Differences between the two data sets are shown in value and percentage terms. At the national level, the Ministry data was systematically lower than the Customs data by a gap varying from 0 per cent in 1983 to -17 per cent in 1989. The absolute difference reached over US\$10 billion in 1990. As highlighted by Lardy, such differences at the national level could “affect any assessment of China's foreign trade.”<sup>12</sup> While Lardy highlighted this statistical pitfall at the national level from 1985 to 1991, there is at present no systematic

8. Baiwei Liao, Yujiang Wang, Enrong Song *et al.*, *Zhongguo gaige kaifang yu zhujiang sanjiaozhou de jingji fazhan* (*The Open Door Policy and Economic Development in the Pearl River Delta*) (Hong Kong: Nanyang Commercial Bank, 1992); Peide Sheng, *Feng cong nanfang lai* (*Wind from the South: Lessons on Reforms and Open Door in Guangdong*) (Guangzhou: Guangdong People's Press, 1992); Zhuo Wang and Wuhan Wen, *Guangdong gaige kaifang pingshuo* (*Comments on Guangdong's Reforms and Opening to the Outside World*) (Guangzhou: Guangdong People's Press, 1992); Dezhi Xu, “Follow the pragmatic approach in developing foreign trade,” in Ruo Lin (ed.), *Reform and Open Door in Guangdong* (Guangzhou: Guangdong Higher Education Press, 1992); Jinping Zhang, “Guangdong sheng waimao chukou de huigu yu fenxi” (“A review of export trade in Guangdong”), *Jihua yu fazhan* (*Planning and Development*), No. 77 (1992), pp. 72–75.

9. T.T. Hsueh, Q. Li and S. Liu (eds.), *China's Provincial Statistics 1949–1989* (Boulder: Westview Press, 1993).

10. See J.N. Bhagwati, “Export-promoting trade strategy: issues and evidence,” *World Bank Research Observer*, No. 3 (1988), pp. 27–57; H. David Evans, “Outward orientation: an assessment,” in Chris Miller (ed.), *Export Promotion Strategies: Theory and Evidence from Developing Countries* (New York: Harvester Wheatsheaf, 1990).

11. See n. 6.

12. See N.R. Lardy, “Chinese foreign trade,” *The China Quarterly*, No. 131 (1992), pp. 691–720.

study of the data problem either beyond 1991 or at sub-national levels. At the national level, Ministry exports were no longer published after 1990.<sup>13</sup>

In Guangdong province, however, we found that the data problem existed far beyond 1990. Table 1 shows that the two different sets of export data co-existed in Guangdong until 1998, and the discrepancy was much larger than that suggested by national level data, especially from 1987 to 1990. In 1987, the provincial Ministry export value was smaller than the Customs value by as much as 47 per cent, while at the national level the gap was only 12 per cent. Such large discrepancies have given rise to speculations on under-reporting by Guangdong's exporting firms to avoid Ministry controls over the use of their foreign exchange.<sup>14</sup> In 1989, the difference was 17 per cent at the national level while the gap had widened to 55 per cent in Guangdong. Since then, the difference at the provincial level reduced gradually until it dropped quite dramatically from 45 per cent in 1992 to 28 per cent in 1993. From 1995 to 1998, the degree of under-estimation of Ministry data was relatively minor. In 1998, Guangdong's Ministry exports were even slightly larger than the Customs statistic. This might be because some of the planned exports reported to the Ministry had not been realized because of the aftermath of the Asian Financial Crisis and thus did not materialize as Customs exports during the accounting period of 1998. In 1999, the dual system of statistical reporting was formally abolished. Thereafter, Ministry exports were no longer published and all published export statistics are Customs data.<sup>15</sup>

Was the sharp fall in the discrepancy between Ministry and Customs exports in Guangdong in 1993 due to the tightening of Ministry controls over under-reporting? A careful examination of China's statistical system shows that this drop actually coincided with a re-definition of Ministry exports by using the "full-value" rather than the "planning" approach. This re-definition has significant implications on the correct interpretation of export statistics in China but it has not yet been carefully examined in the literature. The major difference lies with the accounting method of exports by PAC firms. In fact, an understanding of PAC in the Chinese export structure is very important. Figure 1 shows the material and cash flows of a PAC enterprise. Under the arrangements, a foreign company contracted certain processing or assembly procedures to a PAC enterprise in China by promising to provide the necessary designs, raw materials or component parts and to get back the finished products upon satisfactory completion on the Chinese side. The PAC enterprise, in turn, only earned processing fees (*gongjiaofei*) in foreign exchange.<sup>16</sup> Under the contract,

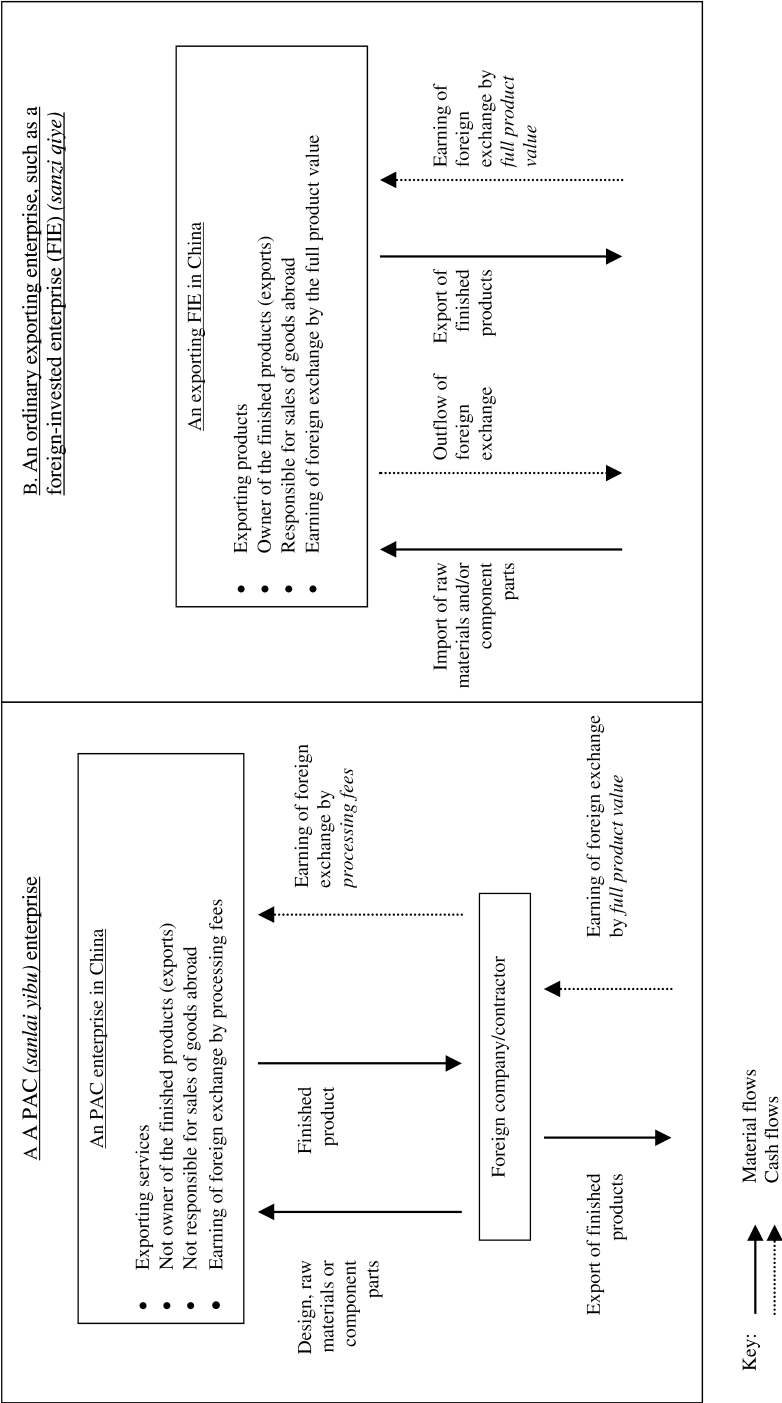
13. The 1991 data were also listed in *ibid.* However, the data could not be traced from the sources provided. Moreover, official statistical yearbooks only published Ministry data up to 1990.

14. Liao *et al.*, *Open Door Policy*.

15. Statistical Bureau of Guangdong (SBG), *Statistical Information Manual of Guangdong* (n.p.: n.p., 2000).

16. The processing fees covered wages and salaries of workers and staff, rewards and bonuses, welfare allowances for labour protection, administrative cost, industrial and

Figure 1: Differences between Exporting PAC and FIE Enterprises



the finished products belonged exclusively to the foreign company, which was responsible for their sale in the international market and would enjoy all foreign exchange proceeds associated with the exports, that is, the full product value of exports. According to the estimate by Wang and Wen, the ratio of processing fees to the full product value of PAC exports was about 1:6.<sup>17</sup> Before 1993, the Ministry used the “planning approach” in compiling export statistics. Under this approach, exports by PAC enterprises were calculated based on the processing fees received.<sup>18</sup> Since 1993, the Ministry changed to the “full-value” approach, which used the full product value of exports in compiling PAC exports. As a result, Ministry exports became systematically higher after 1993 and that the differences between Ministry and Customs exports have become substantially smaller.

In order to gauge correctly the export performance of the PRD after the open policy, it is essential to take note of the effects of different spatial scales. In particular, the relatively small differences between the Ministry and Customs exports at the national level and the fact that national Ministry exports were not published beyond 1990 concealed the much more complicated data discrepancy problem at the sub-national levels. In Guangdong, the differences had been substantially larger and the two sets of export data had co-existed until 1998. Furthermore, the accounting method of Ministry exports had changed in 1993. Unless great care is given to ensure consistency, this re-definition was likely to give rise to a misinterpretation of the data as a sudden boost of exports or the tightening of controls over under-reporting.

*Real significance in the provincial and national contexts.* So, what was the role of the PRD in the export expansion of Guangdong and China over the past two decades? Table 2 shows the relative importance of the PRD in the Ministry and Customs exports of China and Guangdong from 1981 to 1999.

In 1981, the region took up 4 per cent and 33 per cent of the national and provincial Ministry exports respectively. These shares were higher than the region's shares in land area. Following the PRD's 31-county administrative boundary, the region formed less than 0.5 per cent of China's area. However, it accounted for as much as 15 per cent of Ministry exports of the entire country by 1990. In Guangdong, the region took up about 27 per cent of the provincial total area. Yet, it contributed over half (57 per cent) of Guangdong's Ministry exports in 1985 and the regional share rose consistently to 86 per cent in 1992. After the statistical re-definition of Ministry exports in 1993, the PRD contributed

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*footnote continued*

commercial tax, insurance premium, water and power expenses, depreciation cost, transportation and miscellaneous expenses, service charge paid to banks and foreign trade departments, and profits.

17. Wang and Wen, *Comments on Guangdong's Reforms*.

18. Lardy, “Chinese foreign trade.”

Table 2: The Role of PRD in the Exports of Guangdong and China (1981–1999)

|      | PRD's share in China's exports |                   | PRD's share in Guangdong's exports |                   | Guangdong's share in China's exports |                   |
|------|--------------------------------|-------------------|------------------------------------|-------------------|--------------------------------------|-------------------|
|      | Ministry value (%)             | Customs value (%) | Ministry value (%)                 | Customs value (%) | Ministry value (%)                   | Customs value (%) |
| 1981 | 4                              | —                 | 33                                 | —                 | 11                                   | —                 |
| 1982 | 4                              | —                 | 38                                 | —                 | 10                                   | —                 |
| 1983 | 4                              | —                 | 40                                 | —                 | 11                                   | —                 |
| 1984 | 4                              | —                 | 39                                 | —                 | 10                                   | —                 |
| 1985 | 7                              | —                 | 57                                 | —                 | 11                                   | —                 |
| 1986 | 9                              | —                 | 58                                 | —                 | 16                                   | —                 |
| 1987 | 11                             | —                 | 71                                 | —                 | 16                                   | 26                |
| 1988 | 12                             | —                 | 67                                 | —                 | 18                                   | 31                |
| 1989 | 12                             | —                 | 66                                 | —                 | 19                                   | 35                |
| 1990 | 15                             | —                 | 75                                 | —                 | 20                                   | 36                |
| 1991 | —                              | —                 | 78                                 | —                 | —                                    | 38                |
| 1992 | —                              | —                 | 86                                 | —                 | —                                    | 39                |
| 1993 | —                              | —                 | 94                                 | —                 | —                                    | 41                |
| 1994 | —                              | —                 | 76                                 | —                 | —                                    | 42                |
| 1995 | —                              | 37                | —                                  | 97                | —                                    | 38                |
| 1996 | —                              | 35                | —                                  | —                 | —                                    | 39                |
| 1997 | —                              | 35                | —                                  | —                 | —                                    | 41                |
| 1998 | —                              | 39                | —                                  | 95                | —                                    | 41                |
| 1999 | —                              | 39                | —                                  | 98                | —                                    | 40                |

Note:

— data not available.

Source:

Compiled by the author based on Table 1.

94 per cent and 76 per cent of the provincial totals in 1993 and 1994 respectively. Following the new administrative re-classification in 1995, the PRD represented about 1 per cent of the country's land area and 33 per cent of the provincial land area. Nevertheless, it accounted for nearly all the Customs exports of Guangdong province: in 1995 its share reached 97 per cent. This dropped slightly to 95 per cent in 1998 but it rose again to 98 per cent in 1999. In other words, nearly all provincial exports took place in the PRD; and the region accounted for as much as 40 per cent of the Customs exports of the whole country in 1999. To a great extent, the position of Guangdong as the most important exporting province/municipality in China since 1986 was attributable to the export growth of the PRD. In 1999, Guangdong (constituting 2 per cent of the national land area) accounted for 40 per cent of the country's Customs exports. Of this provincial total, the lion's share (98 per cent) came from the PRD.

*Export dependency.* With a clear understanding of the available export statistics, this section turns to the debate of whether the PRD has been a highly export- or outward-oriented economy.<sup>19</sup> A review of the literature shows that export orientation has not been clearly defined<sup>20</sup>; but the share of exports in an economy's Gross Domestic Product (GDP) has been used to measure the export dependency of an economy.<sup>21</sup> As Chinese export statistics, especially at the sub-provincial level, are not directly comparable to foreign countries' (discussed above), international comparisons may not be meaningful. The official definitions are therefore considered more appropriate for gauging the export dependency of the PRD. A major aim of the Chinese government to designate the PRD as an open area was to promote exports and acquire foreign exchange (*chukou chuanghai*).<sup>22</sup> This policy was stipulated in the laws and regulations of the Chinese government. According to the "Provisions of the State Council of the People's Republic of China for the encouragement of foreign investment," enterprises having 50 per cent or more of their production for export and having a balance or surplus in foreign exchange can be called "export-oriented enterprises" and they are eligible for preferential treatment in their operation. Furthermore, enterprises with 70 per cent or more of their production for export are considered "highly export-oriented" and can enjoy even more favourable treatment.<sup>23</sup> These official definitions

19. See C.K. Leung and Becky P.Y. Loo, "Has the Pearl River Delta been an export-oriented economy?" *Journal of Chinese Geography*, Vol. 4, Nos. 3-4 (1994), pp. 1-24; Yan, *Analysis of the Economic Development Model*; Jinping Zhang, "Export trade in Guangdong."

20. See Bhagwati, "Export-promoting trade strategy"; Evans, "Outward orientation."

21. M. Michaely, "Exports and growth: an empirical investigation," *Journal of Development Economics*, No. 4 (1977), pp. 49-53.

22. Deng, *Selected Works*; Lisong Ding, "Main target of special economic zone"; Zimen Jiang, "Learning Deng Xiaoping's theories"; Liwen Wang, Yue Yue and Changjun Yang, *Jianshe zhujiang sanjiaozhou jingji qu: cehua bian* (*Building the Pearl River Delta Economic Region: Planning*) (Gaoyao: Guangzhou Press, 1995).

23. Department of Treaties and Laws of the MOFERT of the PRC, *Collection of Laws and Regulations of the PRC concerning Foreign Economic Affairs* (Beijing: Press of the MOFERT of the PRC, various years).

constitute the yardsticks for classifying “export-oriented” and “highly export-oriented” economies in the PRD.

Again, the limited data availability complicates the issue. From 1981 to 1994, the export-dependency index is compiled by putting Ministry exports over National Income (NI). This is the first local economy export-dependency (LEED1) index. The use of NI is again mainly because the Chinese statistical system had not yet been fully reformed to align with the international statistical system during the 1980s. GDP was not available at the county level. Since this methodological issue is well discussed in the literature,<sup>24</sup> suffice it to say that NI was much smaller than GDP: in 1990, the former was about 23 per cent less than the latter.<sup>25</sup> Since the Ministry exports were also smaller than Customs exports (denominator) and NI was smaller than GDP (nominator), LEED1 should still reveal some information about the export dependency of the PRD. More importantly, it was the only available index during most of the 1980s.

The second local economy export-dependency (LEED2) index is calculated by putting Ministry exports over GDP, when the latter became available in 1989. The third and last local economy export-dependency (LEED3) index is obtained by putting Customs exports over GDP. LEED3 can only be calculated after 1995, when municipality-level GDP became available. Except for those years when data are unavailable, we calculated all three LEED indices from 1981 to 1999.<sup>26</sup> In Table 3, only the benchmark years of 1982, 1986, 1990, 1994, 1995, 1998 and the most recent year, that is 1999, are shown. Based on the official yardsticks, cities and counties having LEED indices of over 50 and 70 are labelled as “export-oriented” and “highly export-oriented” respectively.

If one looks at the LEED1 indices, it is clear that the PRD could not be described as an export-oriented economy in the 1980s. Despite the rapid export growth of the region, the levels of export dependency for most cities/counties in the PRD stayed at very low levels throughout the 1980s. In 1982, none of the cities/counties had their LEED1 indices over 50. In 1986, the export dependency of the region increased to 28. The most rapid increase was recorded in Shenzhen Special Economic Zone (SEZ) (126). Jiangmen could also be described as export-oriented with a LEED1 index of 69. In 1990, seven cities and counties (23 per cent) were export-oriented. The highest values were found in the SEZs of Shenzhen (206) and Zhuhai (104) and in Huizhou (144). The regional LEED1 index barely passed the 50 yardstick (53). Figure 2 shows the changing patterns of LEED1 over time. By 1990, the export-oriented counties did not form any discrete spatial pattern.

24. Hsueh *et al.*, *China's Provincial Statistics*.

25. See Statistical Bureau of Guangdong (SBG), *Statistical Yearbook of Guangdong 1992* (Yichuan: China Statistical Press, 1992).

26. For instance, LEED1 is not available after 1994 because NI data are no longer published. Such statistical confusion is common in China because of its transitional state from a centrally planned economy to a more market-oriented economy. In fact, it is this transition which has fascinated many scholars working on contemporary China area studies.

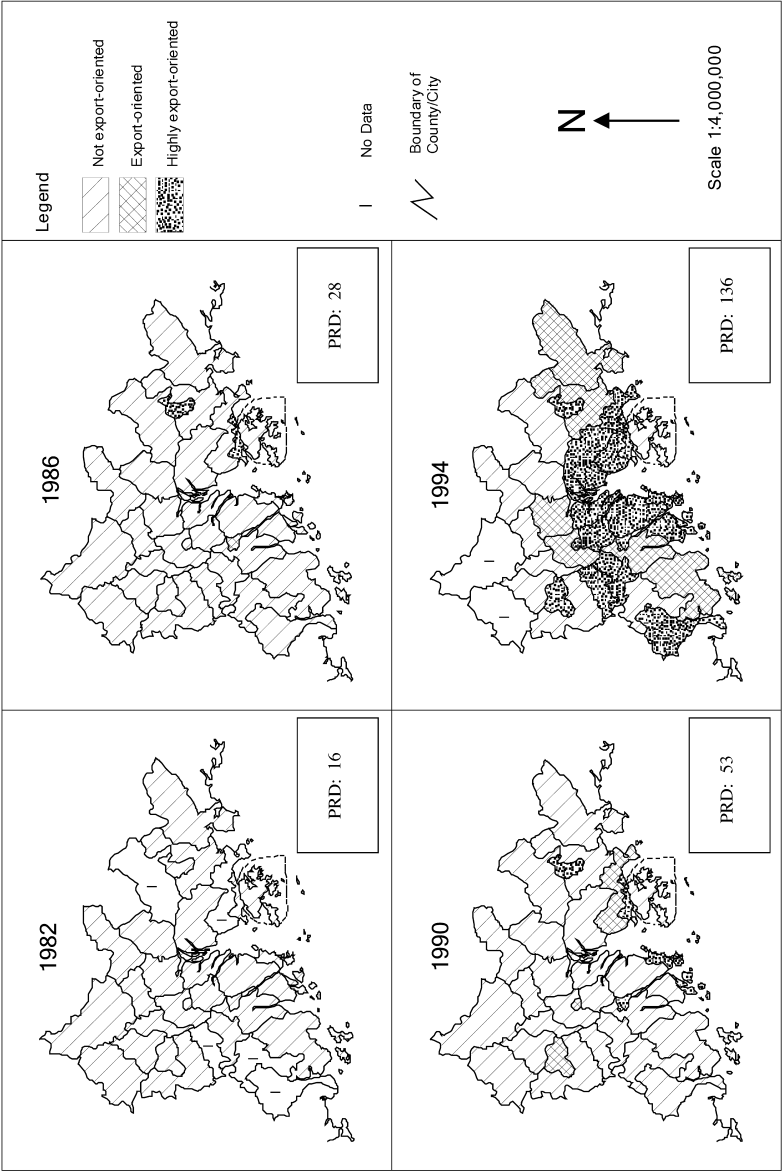
Table 3: Summary Results of Export-dependency Indices in the PRD 1981–1999

|   | LEED1 |                                |  | LEED2   |   |   | LEED3   |   |             |
|---|-------|--------------------------------|--|---|---|---|---|---|-------------|
|   | 1982  | 1986                           | 1990   | 1994  | 1994  | 1994  | 1995  | 1998  | 1999        |
| PRD export-dependency   | 16    | 28                             | 53   | 136   |   |   |   |   |             |
| Share of export-oriented or highly export-oriented cities/countries (%) | 0     | 10                             | 23   | 68  | 103   |   | 102   | 88  | 84          |
| Export-oriented cities/countries (listed in descending order)           | —     | Jiangmen (69)                  | Zhaoqing (67)<br>Bao'an (53)<br>Foshan (53)                      | Xihui (68)<br>Huiyang (64)<br>Huidong (63)<br>Taishan (60)<br>Guangzhou (59)<br>Nanhai (54)   | Shunde (69)<br>Gaoming (65)<br>Enping (60)<br>Xihui (54)<br>Huiyang (52)  |   | Guangzhou (64)<br>Foshan (54)   | Shunde (68)   | Shunde (62) |
| Highly export-oriented cities/countries (listed in descending order)    | —     | Shenzhen (126)<br>Huizhou (74) | Shenzhen (206)<br>Huizhou (144)<br>Zhuhai (104)<br>Jiangmen (75) | Bao'an (930)<br>Shenzhen (237)<br>Huizhou (231)<br>Jiangmen (147)<br>Dongguan (139)<br>Zhuhai (137)<br>Dumen (128)<br>Zhongshan (124)<br>Zhaoqing (123)<br>Panyu (111)<br>Heshan (106)<br>Shunde (88)<br>Foshan (82)<br>Enping (82)<br>Gaoming (75) | Bao'an (737)<br>Shenzhen (255)<br>Huizhou (190)<br>Dongguan (108)<br>Jiangmen (100)<br>Dumen (99)<br>Zhongshan (99)<br>Zhuhai (88)<br>Panyu (86)<br>Zhaoqing (80)<br>Heshan (80)<br>Foshan (72) | Dongguan (317)<br>Shenzhen (215)<br>Zhongshan (107)<br>Zhuhai (95)<br>Huizhou (85)<br>Shunde (83)<br>Panyu (72) | Dongguan (304)<br>Shenzhen (170)<br>Zhuhai (94)<br>Zhongshan (91)<br>Panyu (85)<br>Huizhou (78)<br>Huizhou (78) | Dongguan (304)<br>Shenzhen (163)<br>Zhongshan (86)<br>Panyu (84)<br>Zhuhai (78)<br>Huizhou (78) |             |

## Sources:

Compiled by author based on SBG, *Economic Statistics 1980-1990*; CCPGCO and SBG, *Economic Statistics 1980-1994*; SBG and the Commercial Bank of China, *Economic Statistics 1980-1993*; Statistical Bureaus of the 12 Municipalities in the Pearl River Delta, *Major Socio-economic Indicators 1999*; Statistical Bureau of Huizhou, *Statistical Yearbook 2000*; Statistical Bureau of Panyu, *Statistical Yearbook 2000*; Statistical Bureau of Nanhai, *Statistical Yearbook 1999* and Statistical Bureau of Zhaoqing, *Statistical Yearbook 2000*.

Figure 2: Changing Spatial Patterns of LEED1 in the Pearl River Delta, 1982-1994



Following the statistical re-definition of Ministry exports in 1993, the export dependency of the PRD became higher. In 1994, 21 (68 per cent) cities/counties had their LEED1 index over 50. In other words, two-thirds of the cities and counties could be classified as export-oriented economies. When the 70 yardstick is used, 15 (48 per cent) cities and counties were highly export-oriented economies. In that year, GDP at the county level also became available.<sup>27</sup> Thus, LEED2 should be a better index for gauging the export dependency of the PRD. When LEED2 indices are analysed, the degree of export dependency of the PRD was 103 in 1994. About half (55 per cent) of the counties and cities could be considered as export-oriented or highly export-oriented economies. The highest value was found in Bao'an (737), a bordering county to Shenzhen SEZ. When mapped, the export-oriented economies displayed a clear spatial pattern with concentration in the southern part contiguous to Hong Kong. As the role of Hong Kong in the development of South China has been very well discussed,<sup>28</sup> it is sufficient to pinpoint here that distance or geographical proximity to Hong Kong was a significant factor in understanding the export orientation of the PRD.

Since 1995, the analysis can focus on LEED3, which has the highest value for international comparison. At the regional level, the index was 102 in 1995. Among the 12 municipalities, 75 per cent (nine) had their export-dependency indices over 50. The highest export dependency was found in Dongguan (317), Shenzhen (215) and Zhongshan (107) (Table 3). Whether judged by the LEED3 indices of the PRD at the municipality or regional levels, the PRD had completed its transition to an export-oriented economy. Yet, the degree of export dependency in the region probably also reached its peak in the mid-1990s. After 1995 it began to fall. Though the regional LEED3 index was still well above the 70 yardstick in 1998, it was only 88, much lower than the 1995 level (102). This falling trend can also be identified at the municipality level. Among all municipalities, only Panyu recorded no setback in export dependency from 1995 to 1998. The index fell in all the top municipalities: Dongguan (from 317 to 304), Shenzhen (from 215 to 170), Zhongshan (from 107 to 91) and Zhuhai (from 95 to 94). In 1998, about 58 per cent of all municipalities were export-oriented economies. The falling trend was discernable in the following year. In 1999, the regional LEED3 index decreased slightly from 88 to 84. More importantly, the degree of export dependency in all cities was reduced. Dongguan (304), Shenzhen (163) and Zhongshan (86) were the most reliant on exports as a source of income.

27. As mentioned earlier, the export data in this year refer to Ministry export and no direct comparisons with other countries should be made.

28. G.C.S. Lin, *Red Capitalism in South China* (Vancouver: UBC Press, 1997); Y.Y. Kueh and R.F. Ash, "The fifth dragon: economic development," in B. Hook (ed.), *Guangdong: China's Promised Land* (Hong Kong: Oxford University Press, 1996).

*Structural Composition and the Importance of Geography*

This section examines the structural composition of exports in the PRD. At the national level, Naughton suggests that FIEs have been the most important in contributing to China's exports. At the regional and provincial levels, however, many scholars regarded PAC as the key component of export expansion in the PRD and Guangdong after the open policy.<sup>29</sup> In light of the methodological issues discussed above, we examine the question of whether OT, PAC or FIE exports have been the "engine of growth." Given that sub-provincial breakdowns of Ministry export components are unavailable in the PRD and that the region accounted for a large share of Guangdong's exports, we examine the structural composition of provincial Ministry exports from 1981 to 1997. Starting from 1998, only classifications of Customs exports by trade form<sup>30</sup> and ownership are published. Therefore, the analysis cannot be extended beyond 1997.

Figure 3 shows the breakdowns of Ministry exports into the three components of OT, PAC and FIE exports in Guangdong from 1981 to 1997. Again, great care must be taken to address the statistical re-definition in 1993. Throughout the study period, the relative importance of OT in the Ministry export composition of Guangdong has been declining. The share dwindled from 94 per cent in 1981 to 50 per cent in 1992. Thereafter, the figure continued to fall from 38 per cent in 1993 to 24 per cent in 1997. This is hardly surprising in view of the gradual liberalization of the foreign trade regime in China. However, it is worth mentioning that the absolute volume of OT exports actually expanded quite substantially. From 1981 to 1992, OT exports had increased more than four times from US\$2.2 billion to US\$9.2 billion. From 1993 to 1997, the value also nearly doubled from US\$10.2 billion to US\$17.7 billion. Moreover, the number of FTCs with rights to handle exports had risen dramatically; and the Ministry had granted direct export rights to more domestic manufacturing enterprises in Guangdong.<sup>31</sup>

Generally, the share of PAC did not grow as rapidly as one would expect after reading the vast literature on its rise and crucial importance in the PRD.<sup>32</sup> In 1984, PAC only constituted 11 per cent of the total provincial exports and this share slowly fell to 6 per cent in 1992. After the statistical re-definition in 1993, the real significance of PAC in the province's export expansion can be seen more clearly. In absolute terms, PAC exports skyrocketed from US\$1.1 billion in 1992 to US\$6.4 billion

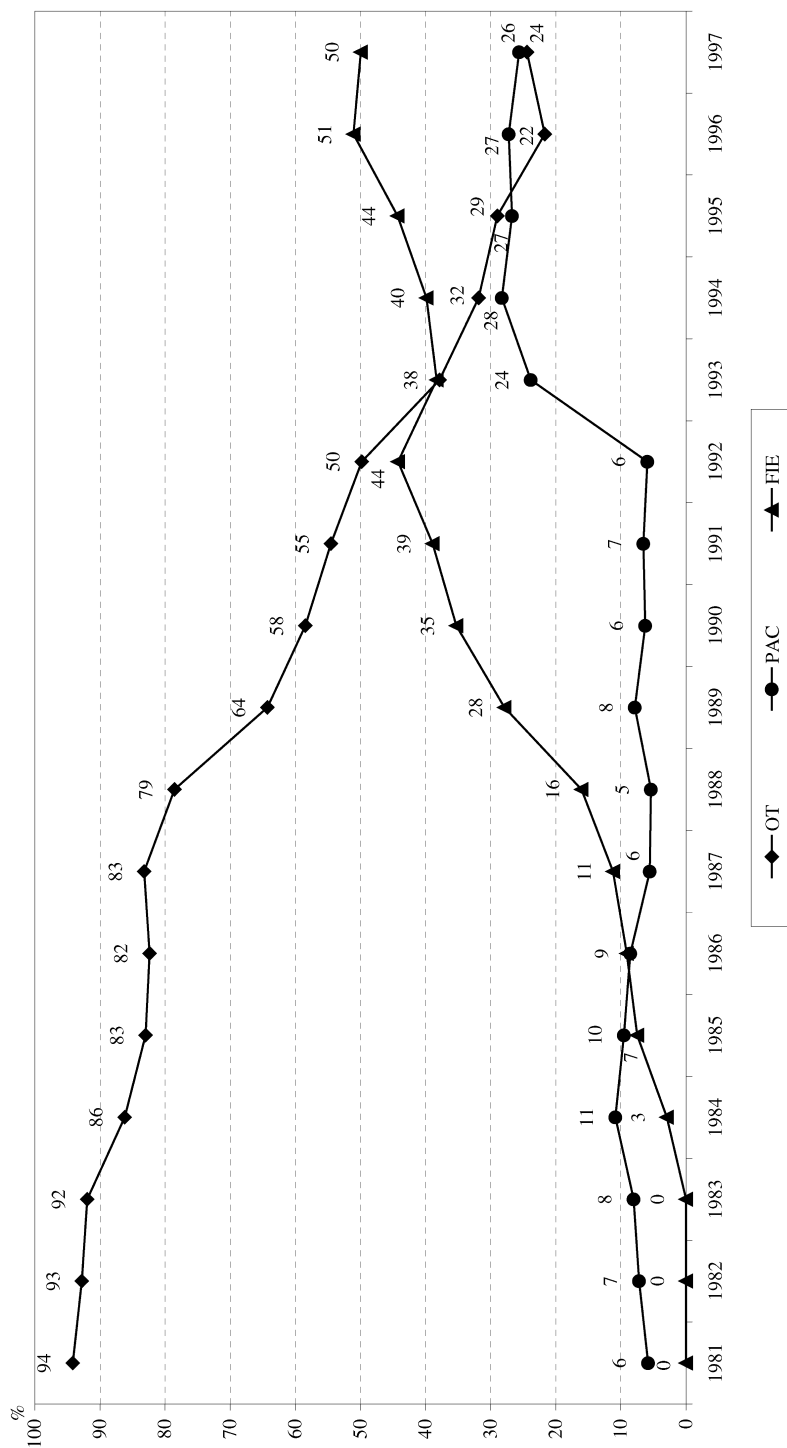
29. Liao *et al.*, *Open Door Policy*; Peide Sheng, *Wind from the South*; Wang and Wen, *Comments on Guangdong's Reforms*; Dezhi Xu, "Follow the pragmatic approach"; Jinping Zhang, "Export trade in Guangdong."

30. Instead of OT, PAC and FIEs, a finer eight-category classification has been used. These categories are "general trade," "processing and assembling with customer's materials," "compensation trade," "processing and assembling with import materials," "barter trade," "bonded warehouse," "donation" and "others."

31. Guangdong Foreign Economic Relations and Trade Committee, *50 Years*.

32. See Liao *et al.*, *Open Door Policy*; Peide Sheng, *Wind from the South*; Wang and Wen, *Comments on Guangdong's Reforms*; Dezhi Xu, "Follow the pragmatic approach"; Jinping Zhang, "Export trade in Guangdong,"

Figure 3: Changing Composition of Ministry Exports in Guangdong



in 1993. The increase was roughly six times; a magnitude which coincided with Wang and Wen's estimate on the ratio of processing fees to the full product value of PAC exports.<sup>33</sup> In other words, there was no sudden increase in the importance of PAC exports. The use of the "full-value" rather than the "planning" approach in compiling Ministry exports accounts for the sharp increase in PAC's share from 6 per cent in 1992 to 24 per cent in 1993. This share again remained relatively stable thereafter. In 1994, the figure was 28 per cent. After that, it even declined slightly. With a clear understanding of the export statistics, the argument that PAC was the major contributory factor behind the export growth of the PRD is not entirely accurate. Throughout the mid-1980s and 1990s, PAC's share has remained relatively stable and it consistently contributed about one-quarter (24 to 28 per cent) of the exports of Guangdong.

In contrast, the share of FIEs rose most rapidly from less than 0.1 per cent in 1983 to 44 per cent in 1992. The statistical re-definition in 1993 slightly reduced the importance of FIEs in the provincial Ministry exports to 38 per cent but its share climbed steadily thereafter. In 1995 it reached 44 per cent, and it kept on increasing to 51 per cent in 1996 and stayed at 50 per cent in 1997. By the end of the study period, the relative importance of OT, PAC and FIE exports was completely reversed when compared to the beginning. In 1997, FIE exports (50 per cent) were the most important component of Guangdong's exports; and the shares of OT (24 per cent) and PAC (26 per cent) exports were roughly similar.

*Is geography still important?* Naughton's argument of the key role of FIEs has led to a separate (but related) argument that geography is no longer important in understanding the export growth of China. In particular, "in essence, China created a kind of gigantic export processing zone, defined not geographically, but by the juridical status of the enterprise involved."<sup>34</sup> The basic argument was that FIEs could enjoy preferential treatment, especially in terms of free import rights, regardless of their location and place of registration in China. Thus, the export promotion regime of the country was not a geographically-biased but a sector-biased policy and exporting FIEs operated under a "separate, export-promoting trade regime."<sup>35</sup>

If the relative importance of FIEs in Guangdong was similar to that at the national level, this would provide strong support for the argument that the emergence of FIEs was not specifically a geographic phenomenon mainly attached to the coastal region. Of course, it still means that the absolute number of FIEs would be much greater in the coastal region (simply because of the much higher export value there). Juridical distinction, rather than geographical delimitation, largely explains the export expansion in China over the past two decades. If the two shares differ widely, there are grounds to believe that the geographically-biased policy played an equally important role in understanding the export expansion of

33. Wang and Wen, *Comments on Guangdong's Reforms*.

34. Naughton, "China as a trading nation," p. 302.

35. *Ibid.*

the country. Moreover, the growing importance of FIEs was actually spatially concentrated and could not be separated from the more attractive investment environment offered in the coastal open areas.

Naughton's analysis was conducted at the national level and his study period ended in 1995. We extend the analysis to beyond 1995 and, more importantly, to the sub-national level. Table 4 shows the relative importance of FIEs as a component of Ministry exports in China and Guangdong. Additionally, the values of FIE exports in China and Guangdong and the shares of Guangdong in national FIE exports are shown. Over time, Table 4 shows that the rising trend in the FIEs share in Guangdong has been much stronger than the national level in terms of degree and consistency. Before the statistical re-definition in 1993, the share of FIE exports in Guangdong's Ministry exports jumped from 8 per cent in 1985 to 44 per cent in 1992. In contrast, FIEs have much lower significance at the national level. The percentage of FIEs in China's Ministry exports, though also rising, only increased from 1 per cent in 1985 to 20 per cent in 1992. Given the importance of Guangdong in the national Ministry exports (see Table 1), most of these FIEs were likely to be found in the province. In fact, Table 4 also shows that most exports of FIEs in China actually took place in Guangdong. In 1985, about 73 per cent of FIE exports in China (US\$0.3 billion) were realized in the province (US\$0.2 billion). This share gradually declined until 1989 when it reached 46 per cent. Thereafter, the data show some fluctuations but Guangdong still accounted for about 47 per cent of all exports by FIEs in the country by 1992. In absolute value, Guangdong's FIE exports reached as much as US\$8.2 billion. Generally, the relative importance of FIEs has varied according to the geographically-biased development strategy in the PRD.

After the statistical re-definition, FIEs were still a much more important component in Guangdong's exports than in national exports. Since 1993, the share of FIEs in provincial exports stayed consistently above the national share by a wide margin. In 1993, FIEs accounted for 38 per cent and 26 per cent of the provincial and national Ministry exports respectively. By 1997, the shares at the provincial and national levels were 50 per cent and 24 per cent respectively.<sup>36</sup> Such widening gaps testified to the different relative importance of FIEs over space. Despite some minor fluctuations, about half of the FIE exports in China came from Guangdong. The provincial share of China's FIE exports varied from a low of 41 per cent in 1993 to a high of 54 per cent in 1994. By the end of the study period, the provincial share was relatively stable at around 48 per cent. In absolute terms, FIE exports in Guangdong skyrocketed to US\$36.3 billion. Again, the high spatial concentration of FIEs in Guangdong can be most clearly shown if this percentage share is

36. In 1999, Customs export breakdowns were available according to the new ownership classification of "state-owned," "collective owned," "private," "foreign funded" and "others." In Guangdong, the share of "foreign funded" export enterprises constituted 50.7% of the total exports. See SBG, *Statistical Yearbook of Guangdong 2000*. However, comparable data are not available at the national level.

Table 4: The Relative Importance of FIEs in Guangdong and China 1985–1997

|      | Share of FIEs in total exports |                           | FIE exports                             |   |  |
|------|--------------------------------|---------------------------|---|---|--|
|      | China (%)<br>(Col. 1)          | Guangdong (%)<br>(Col. 2) | China (100<br>million US\$)<br>(Col. 4) | Guangdong<br>(100 million<br>US\$) (Col. 5) | Share of<br>Guangdong<br>(%) (Col.<br>6 = Col. 5/Col.<br>4*100%) |
| 1985 | 1                              | 8                         | 3.0                                     | 2.2   | 73   |
| 1986 | 2                              | 9                         | 5.8                                     | 3.9   | 67   |
| 1987 | 3                              | 11                        | 12.1                                    | 6.1   | 50   |
| 1988 | 5                              | 16                        | 24.6                                    | 12.0  | 49   |
| 1989 | 9                              | 28                        | 49.1                                    | 22.8  | 46   |
| 1990 | 13                             | 35                        | 78.1                                    | 37.2  | 48   |
| 1991 | 17                             | 39                        | 120.5                                   | 53.3  | 44   |
| 1992 | 20                             | 44                        | 173.6                                   | 81.6  | 47   |
| 1993 | 26                             | 38                        | 252.4                                   | 103.5                                       | 41   |
| 1994 | 29                             | 40                        | 347.1                                   | 187.4                                       | 54   |
| 1995 | 32                             | 44                        | 468.8                                   | 246.7                                       | 53   |
| 1996 | 25                             | 51                        | 615.1                                   | 301.4                                       | 49   |
| 1997 | 24                             | 50                        | 749.0                                   | 363.0                                       | 48   |

Source:

Compiled from SSB, *China Foreign Economic Statistical Yearbook 1999*.

compared with other provincial shares. In 1997, the shares of Guangdong in the national land area, population, GDP and Customs exports were 2, 6, 10 and 38 per cent respectively.<sup>37</sup> In sharp contrast, around 48 per cent of the national FIE exports clustered in Guangdong. Geographically, FIE exports were more concentrated than all other indicators, including total Custom exports, in Guangdong.

As suggested by Naughton, FIEs enjoyed preferential treatments ranging from lower tax rates to more liberal import rights (unavailable to domestic enterprises). Juridical status was certainly helpful in understanding the export expansion in China. However, the spatial dimension remained important even by the late 1990s. Under the open policy, the initial advantageous position of the PRD stemmed from the geographically-biased policy of the central government permitting local governments, especially in SEZs, open cities and local provincial governments, to offer more attractive packages for export enterprises. Though “export-oriented” enterprises (as defined by juridical status) enjoyed preferential treatments, enterprises operating in the open areas had additional preferential treatments stipulated in specific laws and regulations at the local level.<sup>38</sup> Furthermore, the environment in which an export enterprise operated did differ according to its physical location within mainland China.<sup>39</sup>

Since 1992, the central government has attempted to level the field of play within the country by standardizing the preferential treatments to be granted at local levels.<sup>40</sup> Nevertheless, the coastal open areas (especially Guangdong) had already taken “one step ahead” in creating their own favourable investment environment to attract exporting FIEs. For instance, the most lucrative domestic market (especially for luxury goods) was highly concentrated at the major coastal cities.<sup>41</sup> Thus it is not surprising to find that the relative importance of the PRD and Guangdong has not declined after the mid-1990s (Table 1). Geography remains important in understanding the export expansion of the country. Throughout the late 1990s, exports from the PRD and the region’s contribution to national exports have continued to rise despite the gradual elimination of differences in preferential treatments. No doubt the juridical status of exporting firms, as elaborated in the work of Naughton, is important in understanding the export performance in China under the open policy. However, the explanation remains incomplete should the spatial dimension be ignored. This is because the rise of FIEs, as an “engine” of export growth in China, was not ubiquitous but a geographically-biased phenom-

37. SSB, *China Statistical Yearbook 1998*; SBG, *Statistical Yearbook of Guangdong 1998*.

38. S.J.Cao, J.S. Zhou and S.J. Bai (eds.), *China’s New Policies to Absorb Foreign Investment* (Hong Kong: Hong Kong Wen Wei Po and Beijing International Business, 1991); Legislative Bureau of the People’s Government of Guangdong Province, *Guangdong’s Legislation*.

39. Leung and Loo, “Pearl River Delta.”

40. Naughton, “China as a trading nation.”

41. Federation of Hong Kong Industries, *Hong Kong’s Industrial Investment in the Pearl River Delta: 1991 Survey among Members of Federation of Hong Kong Industries* (Hong Kong: Industry and Research Division, Federation of Hong Kong Industries, 1992).

enon closely associated with a policy of spatial deployment towards the coastal areas. Thus, the juridical status and geographical locations of the exporting firms are equally important in understanding the export performance of China since 1978.

### *Conclusions*

A temporal analysis of China's export performance in the past two decades hinges on a clear understanding of the complex and evolving official statistical system in the country. It is only against this background that a better understanding can be gained about the export orientation of the PRD. By following the yardsticks of 50 and 70 in assessing the export-dependency indices, the region has completed its transition to an export-oriented economy in the 1990s. Geographically, the pattern of export dependency remained highly clustered in the southern part of the region contiguous to Hong Kong. Moreover, FIE, instead of PAC, exports were found to be the most significant as the "engine of growth." Spatially, FIE exports remained highly concentrated. When compared to the national picture, FIEs have been of much higher relative importance in contributing to the export growth of the PRD. In addition to the juridical status of the exporting firms, the spatial dimension has remained useful in comprehending the export performance of the PRD in particular and the country in general.

Appendix: **Changing Boundary of the Pearl River Delta**

## A. 1981–1994



## B. Since 1995



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