

**China as a 'Model' of Utilizing Foreign Capital for Economic Development:
Perceptions, Observations and Interpretations**

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ABSTRACT

In recent years, China has been widely regarded as the most successful country in the world in utilizing inward foreign direct investment for its economic development. In particular, it has been portrayed and praised by the orthodox establishments of globalization as a 'model' in this regard for the rest of the developing world. The objective of this paper is to assess the role of FDI in China's economic development with reference to the broader literature on FDI and late development. Its main analytical finding is that FDI in China has promoted economic development in one respect (improving allocative efficiency), but has had unfavourable effect in another respect (worsening productive efficiency), resulting in an overall impact that tends to be on the negative side. The orthodox story of China is thus judged to be partial or even misleading.

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1. Introduction

China has been amongst the world's largest recipient countries of foreign direct investment (FDI) since the early 1990s. In 2002, the first year after the country's accession to the World Trade Organization, it for the first time surpassed the United States of America to become the world's largest FDI-recipient – with the actual amount of FDI accounting for around 10% of the world total. The amount has continued to expand in the subsequent years, reaching a total of US dollar 60 billion in 2005. Concerned analysts generally predict that further increases in FDI in China are most likely in the years to come, amid the increasing integration of the country into the world market. Thus, proper assessments of the role FDI has played in China's economic development are clearly of widespread policy importance.

Such assessments are of intellectual significance, too. For, despite all its specificity or even uniqueness, China's experience in utilizing FDI provides an important case for testing the efficacy of contrasting intellectual views on the role of foreign capital in late development in general. It is also well known that recent debates over the developmental implications of the process of globalization in the world economy in the 1980s and 1990s have to a significant extent focused on the interpretations of the Chinese experience. And the orthodox establishments in the prevailing world order have been outspoken in portraying and praising China as a 'model' for the rest of the developing world in the utilization of FDI for economic development.

Existing studies on the role of FDI in China's economic development have broadly followed two analytical approaches. One approach is to express various measurements of FDI as ratios to main macroeconomic indicators – gross domestic product (GDP), gross fixed capital formation, total exports, etc. – and thereby to infer about the contribution of FDI to economic growth. A second approach is to carry out regression analyses of the relationship between measurements of FDI and indicators of economic development, including observed indicators such as GDP growth and unobserved indicators such as total factor productivity growth. This second approach has been applied to both analyses at the aggregate level and, more popularly, comparative studies across sectors or regions.

We believe these existing studies, while offering insights, are still far from adequate for producing a definitive account in interpreting and assessing China's experience. At one level, with respect to the broader literature on globalization and late development, the two analytical approaches appear to be excessively narrow in focus. They tend to centre around propositions and hypotheses framed according to mainstream neoclassical economics, while ignoring the important contribution from alternative theoretical traditions. At another level, even within the confine of the mainstream propositions and hypotheses, a range of difficulties

in applied analysis appear to have remained for the existing studies to cope with. In particular, in the analyses of the relationship between FDI and China's economic development, both of the two approaches have had difficulty in differentiating between correlation and causation (in the usual rather than statisticians' meaning of the word). What is conspicuously inadequate in the existing studies is the identification of the concrete channels or mechanisms through which FDI impacts on the economic development of China. Thus, both for addressing the concerns of the broader literature on globalization and for verifying the mainstream propositions and hypotheses, the interpretation and assessment of the impact of FDI in China must be analyzed in relation to China's particular paths or patterns of economic development.

In this paper, we offer a review of the main features of FDI in China with a purpose of producing an overall picture of the experience. This is essential not only for any proper assessment but also for evaluating the established theoretical views on FDI and late development. Our ambition is to relate the analyses to China's particular paths or patterns of economic development, in the belief that this will offer new insights for understanding the complex experience. This paper is organized in five sections, of which this introductory section is the first one. Section two and three will, respectively, briefly review relevant theoretical issues and the literature of applied studies on China's experience. Section four then examines main features of FDI in China in the light of the preceding literature surveys. It also extends to examine the scales, operations and performance of foreign capital-funded enterprises. Section five gives a discussion on the developmental significance of the empirical observations, and concludes the paper.

2. Theoretical Perspectives and Conceptual Issues

There exists a vast literature on FDI and late development in the world economy. Broadly speaking, three established theoretical traditions, each of which comprising a range of analytical propositions, are discernible. And the propositions are based on either theoretical arguments or generalized empirical observations, or both (for elaborate reviews on these theoretical traditions, see, e.g., Hirst and Thompson [1999], Lo [1995], Saggi [2002], and UNCTAD [1995] and [1999]).

The first tradition, generally considered to be the mainstream for its association with major international agencies (especially the World Bank and other 'Washington institutions'), is largely based on neoclassical economics. Its views on the role of FDI in late development comprise the following main propositions: first, FDI represents the availability of additional financial resources, over and above domestic savings; second, FDI represents the availability of additional foreign exchange, over and above the export earnings of domestic firms; and, third, FDI could promote productivity change in the recipient economy via technology

transfer (inclusive of the transfer of managerial practices and knowledge of the world market) and structural/institutional change. The first proposition is standard neoclassical economics. The second proposition is derived from some 'gap' models (and hence not, strictly speaking, standard neoclassical), where the assumption is that there exist certain produced goods that are essential to economic development but are not readily available from domestic producers. And the third proposition is broadly associated with the notion of best practices as defined in the production function, and ultimately determined by competition in the world market. The productivity growth could arise from moving towards the production frontiers, or, as some theories of endogenous growth tend to emphasize, realizing static and/or dynamic increasing returns.

The second tradition, known as structuralist development economics in the literature, while not necessarily opposing the above propositions, tends to highlight two critical drawbacks of FDI. The first one can be summarized as 'competition kills'. Especially where the carrier of FDI is transnational corporations (TNCs), which typically have technological and scale advantages over domestic firms, a main impact of FDI is likely to be the extension of the monopolistic power of these foreign firms into the domestic market. The second one can be summarized as 'competition distorts'. Again, especially where the carrier of FDI is TNCs, which typically have acute competition among themselves in the world market, a main impact of FDI is likely to be the distortion of the economic structure of the recipient country – in the forms of excessive duplication of industrial projects, fragmentation of the structures of industries, and obstruction to the development of linked upstream capital-intensive industries. At one level, both of the two propositions are an application of established theories of industrial organization to this particular field. At a more substantive level, the application is hinged on the further proposition that, in the world market, most dynamic (fast productivity-growing) industries are characterized by imperfect competition and the predominance of a small number of TNCs in each of them.

The third tradition, known as radical political economy, encompasses a wide range of diverse views of which two groups have been most influential. One group of views have coalesced around the thesis of the 'new international division of labour', which posits that de-skilling is the likely outcome of the division of labour under modern capitalism (the 'Taylorization' of work) and that capital export from advanced countries tends to be motivated by the pursuit of cheap labour. The logical expectation, in these views, is that such capital tends to perpetuate the position of the recipient late developing countries in specializing in low technology/skill production and getting low income for workers – a development trap that is difficult to escape. Meanwhile, another group of views centre around the idea of the 'internationalization of (the contradictions of) capital'. It is posited that capital export from advanced countries is typically motivated by demand deficiency and/or falling

profitability in the home market, and, by helping to create new centres of production in developing countries, it tends to result in over-accumulation on an expanded scale. Consequently, by receiving such foreign capital as a means of integrating themselves into the world market, late developing countries will often have to bear the brunt of severe fluctuations in the world economy – so much so that any developmental achievements they have made are constantly threatened to evaporate.

It must be stressed that the propositions pertaining to the different theoretical traditions as outlined above, while carrying ideological contents in their own right, are clearly of important analytical insights. The intellectual contribution of these propositions, which entail asking different questions and/or offering different answers, could be evaluated from the standpoint of economic development. They should thus be treated as analytics rather than just doctrines of belief, and their validity or otherwise is ultimately an empirical issue. It is with reference to this broader theoretical literature that the strength and limitation of existing studies on FDI and China's economic development can be properly assessed.

3. Existing Studies: Strength and Limitations

Existing studies on the topic have, almost exclusively, followed the mainstream tradition – in the sense that they hold the assumption that FDI represents a net addition in financial and/or technological resources for recipient economies. Two main approaches have been adopted for such analyses. The first approach is simply to express various measurements of FDI as ratios to main indicators of economic aggregates, and thereby to 'read out' the contribution of FDI to economic development. It is found that the ratio of FDI flows to China's GDP, or gross fixed capital formation, was quite small in the 1980s but has become quite large – by international standard – since the early 1990s. It is also found that, of China's rapidly expanding total exports, the share accounted for by foreign capital-invested enterprises (FIEs) has risen very sharply. And, for both indicators, the impact of FDI is found to be particularly pronounced in fast-growing coastal provinces or regions (Chen *et al.* [1995]; Kaiser *et al.* [1996]; Lardy [1995]; Zhang and Song [2000]).

The second, complementary approach is to carry out regression analyses of the relationship between various measurements of FDI and indicators of economic development. This is intended both to examine the indirect impact of FDI on observed development indicators such as GDP growth, which does not show out in the analyses of the first approach, and to capture the impact on unobserved indicators such as total factor productivity (TFP) growth. Findings of these analyses vary, depending on the specification of the models used for estimation, but it is generally found that the indicated correlations are positive and significant. Perhaps the most optimistic finding is that, in the 1990s, FDI has raised China's

TFP growth by 2.5 percentage points. Together with the effect of raising GDP growth by 0.4 percentage points via its addition to capital formation, the total contribution of FDI to China's economic growth over the 1990s is estimated to be near three percentage points per annum – that is, almost one-third of the total (Tseng and Zebregs [2002]). Meanwhile, other studies have found that FDI flows have been positively and significantly correlated with investment growth, and this has been interpreted as evidence of the existence of an investment crowding-in effect (Kueh [1992]; Zhan [1993]).

More recently, a practice that is in the spirit of the second approach has become very popular among concerned scholars. This, namely, is to carry out analyses of the correlation between FDI and local-level economic growth – for individual regions or for cross-region comparison. The motivation is the easily observed fact that regions or provinces with a higher FDI intake have tended to exhibit faster economic growth. And the analyses typically find that these two sides are positively and significantly correlated, and that FDI contributes to local economic growth via various kinds of direct or indirect impact including the addition to local capital formation, the crowding-in of local investment, and the enhancement or efficient utilization of the local stock of productive skill/knowledge. Inferences have thereby been made that FDI does explain the diverse growth performance across regions or provinces, and that this holds important policy lessons for China as a whole (Berthélemy and Démurger [2000]; Mody and Wang [1997]; Wei [1994]; Wei *et al.* [2001]; Zhang and Felmingham [2002]).

It is particularly at this point that the limitation of the existing studies has become clear. This, namely, is the difficulty of differentiating between relationships of causation and those of correlation. This is a problem that runs through all the existing studies, but it is particularly serious in the regional or cross-regional regression analyses. For the regions being analyzed are after all within the same country, under the same system (i.e., interrelated institutional and policy regimes) and using the same currency, which all imply ample possibilities for rent-making as a source of local economic growth. Thus, even if it is found that FDI is correlated with local economic growth, it is not clear whether this is underpinned by income transfer from the rest of the country or by truly productivity improvement in the local economy – both being possible outcomes of FDI flows, especially in the context of differentiated degrees of marketization across regions. Conversely, in the extreme circumstance where the rent-making attributes outweigh those of productivity enhancement, the net outcome of FDI might well be a negative instead of positive contribution to the economic development of the country as a whole.

The general point from the preceding discussion is that the indicated possible problem would simply be overlooked or ignored by the kinds of regression analysis that is typical of existing studies – including those using simultaneous-equation estimation or the method of

Granger-causality test to analyse the relationship between FDI and local economic growth. The problem as indicated is not about FDI flows causing growth and/or growth causing FDI flows. It is about whether FDI generates growth through rents or through productivity improvement.. Thus, it is only by linking up the analysis with China's particular paths or patterns of economic development that the precise mechanisms through which FDI impacts on the economy can be properly identified, and the impact can be properly assessed.

The need to link up the analysis of the impact of FDI with the particular development paths of the economy is also logically related to the insights offered by the other two traditions in the boarder theoretical literature. Both traditions place emphasis on a range of additional factors that are considered to be crucial in determining the net impact of FDI. These include the mode of entry of foreign firms into the domestic market, the kind of technology being transferred, the institutional and structural conditions that shape the patterns of competition in the domestic market, etc. Existing studies on China, as mentioned, have mostly ignored these concerns. A notable exception, though, has carried out a firm-level analysis that is in the spirit of testing the structuralist propositions that competition kills/distorts. And the finding is rather interesting: that the impact of FDI on the output and productivity change of domestic firms varies across industries, and between the short run and the long run (Hu and Jefferson [2002]). Whilst the general importance of this particular case study is a matter requiring exploration, it can be said that works of this kind indicate exactly the importance of identifying the specific mechanisms through which FDI impacts on the economy.

4. Claims and the Reality: Observations and Analyses

Prima facie, immediate macroeconomic indicators do not support the view that FDI has been an important factor in China's overall economic development. As a ratio to gross fixed capital formation, FDI flows were of rather small magnitudes from 1979 to 1991 (Figure 1). Massive increases do have occurred from 1992, with the ratio averaging to around 13% for the years until 2005. This ratio is roughly twice as large the average for all developing countries. Nevertheless, because they were only a fraction of gross fixed capital formation, and the latter was in turn only a fraction of GDP, FDI flows could not account for a significant part of China' economic growth – the contribution to GDP growth was unlikely to have exceeded one percentage point a year over the 1990s (all data in this paper are from *Zhongguo Tongji Nianjian* [China Statistical Yearbook], various issues, unless indicated otherwise).

[Figure 1]

Three points can be raised regarding the limitation of the above indicator: first, that figures of FDI flows do not reflect the full addition of FDI to capital formation because there

are also investment by foreign capital-invested enterprises (FIEs) using retained profits, second, that the ratio of FDI flows to capital formation does not capture the possible indirect investment crowding-in effect, and, third, that the ratio also does not show the unobserved impact of FDI in raising the TFP of the economy. To verify the first point requires firm-level investigations, which cannot be done at this stage because the data are not available. Intuitively, however, a judgement can be made that, given the limited scale of FDI flows before the mid-1990s (and hence the fact that as of 1994 FIEs accounted for only 11% of the industrial value-added of all enterprises), it could only be a recent phenomenon that retained profits become a significant source of funds for investment by FIEs. Similarly, for the second point, given the well-known fact that until the mid-1990s the reformed Chinese economic system and the economic agents typically exhibited the incentive to over invest, any possible crowding-in effect brought about by FDI was likely to be significant only in recent years. Thus, there remains the third point, regarding the possible contribution of FDI to TFP growth (via technology transfer, promotion of institutional and structural change, etc.), which is also the focus of existing studies.

Conceptually, the possible contribution of FDI to TFP growth could manifest itself through two main channels: the generation of export earnings, and the improvement of the efficiency of FDI-receiving firms and industries. Export earnings are important because they could be used to finance technology imports, not least in the embodied form of machinery and/or industrial inputs. On this count, again, Chinese data do not appear to be clearly supportive of the mainstream view. True that FIEs have accounted for a rapidly expanding share of China's total exports, exceeding 40% from 1996 and 50% from 2001. Yet, as can be seen from Table 1, it is also true that FIEs have accounted for an even larger share of total imports. For 13 years from 1985 to 1997, FIEs ran a sizeable foreign trade deficit every year, quite in contrast to China's overall trade surplus for most years after 1989. And, although FIEs have enjoyed trade surplus every year from 1998, such surplus has in most years accounted for only a minor part of the national total. It is, of course, noted that parts of the imports by FIEs are production equipment which they bring along with their investment. The possible contribution to TFP growth in this regard then comes down to two forms: technology transfer to FDI-receiving firms which use the imported equipment, and the potential for FIEs to become important net exporters over the long term – the latter possible contribution, as noted, did not really materialized until the very recent years.

[Table 1]

According to mainstream theories, the possible contribution of FIEs to TFP growth could take various forms: technology transfer to FDI-receiving firms, spillover effects on other firms of the same industries and/or of linked industries, the promotion of structural change of the economy in the direction of following its 'endowed' comparative advantage,

the promotion of institutional change in the direction of following the principles of the market, etc. Whether or not these theoretical views are valid, and whether or not some or all of such benefits are present, the net effect will show up mainly in the performance of the entire sector of FIEs relative to the rest of Chinese industry.

Figure 2 charts out the productivity performance of FIEs relative to Chinese industrial enterprises as a whole. Note first the relative labour productivity series, which exhibits a trend of secular decline from 1993 to 2005. On the face of it, this trend is consistent with both the neoclassical thesis of structural change towards China's endowment-determined comparative advantage – that is, taking advantage the existing 'cheap labour' (labour abundance) in China – as well as the radical thesis of deskilling. In other words, it is quite possible that the trend embodies improving allocative efficiency and/or worsening productive efficiency. It is thus necessary to turn to look at the indicator of overall efficiency performance, represented by the evolution of the total factor productivity (TFP) series. Again, the relative TFP series exhibits basically the same trend of secular decline, amid the massive expansion of FDI inflows and of the sector of FIEs over the 1993-2005 period. This suggests that the productive efficiency loss has been dominating the allocative efficiency gains, which is hardly supportive to a positive assessment of the contribution of FIEs to China's economic development.

[Figure 2]

In this connection, it is also of note a related question that would naturally arise: if its relative efficiency has been actually falling, why has the sector of FIEs expanded rapidly meanwhile in terms of its share in Chinese industry as a whole? To answer this question requires further investigation, but it is likely that the answer lies in the area of labour compensation. As is well-known, because of the effectively unlimited supply of immigrant workers, wage rates in most of China's labour-intensive, export-oriented FIEs have remained basically unchanged at very low levels ever since the beginning of the reform era. Figure 2 shows that the average wage rate of FIEs relative to all Chinese industrial enterprises has also followed a declining trend. Given this condition, it might have still been profitable for FIEs themselves despite the deteriorating trends of relative labour productivity and TFP. The trends themselves, however, still imply that, for the Chinese economy (and society) as a whole, the development associated with the expansion of the sector of FIEs is not efficient.

A further issue related to the discussion above concerns the impact of the expansion of FIEs on China's foreign trade. As is well-known, China's foreign trade since the early 1990s has been increasingly dominated by processing trade. And this is mainly due to FIEs, whose export and import activities are mostly processing trade. Table 2 provides some figures indicating the actual performance, particularly note-worthy the production characteristics, of China's processing trade since 1990. It is noted that the value-added rate, defined as the ratio of net to gross exports, first increased steadily but then has from 1998 onwards ceased to

further increase. The rate has remained at a lower level, 34% both in 1998 and 2005. This low rate of domestic value-added for a major part of China's foreign trade might have well been significantly responsible for the secular trend of deterioration of China's international terms of trade since the early 1990s. In any event, it is not in line with China's pursuit of upgrading its industrial structure. And this is why the state leadership has been in recent years strongly promoting the development of indigenous, independent technological capabilities.

[Table 2]

5. Conclusions

The objective of this paper is to assess the role of FDI in China's economic development with reference to the broader literature on FDI and late development in general. Its main analytical finding is that FDI in China has promoted economic development in one respect (improving allocative efficiency), but has had unfavourable effect in another respect (worsening productive efficiency), resulting in an overall impact that tends to be on the negative side. The orthodox story of the Chinese experience, which has portrayed and praised China as a 'model' for the rest of the developing world in the utilization of FDI for economic development, is thus judged to be partial or even misleading.

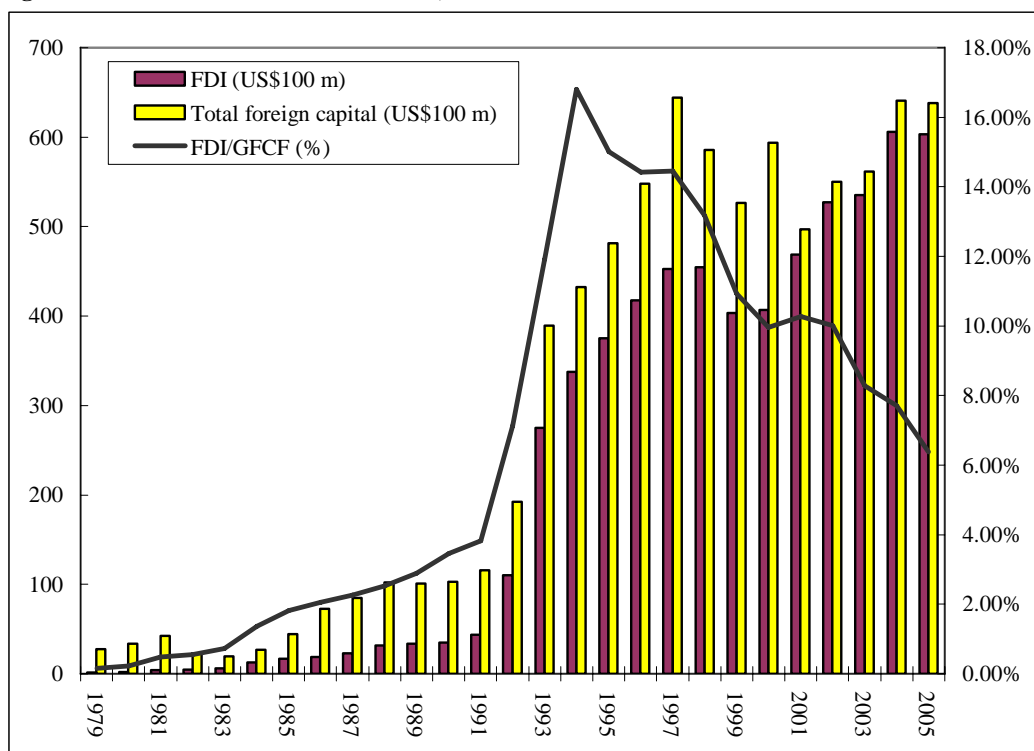
References

- Berthélemy, J-C. and S. Démurger (2000) 'Foreign direct investment and economic growth: theory and application to China', *Review of Development Economics*, 4 (2): 140-155.
- Chen, C., L. Chang and Y. Zhang (1995) 'The role of foreign direct investment in China's post-1978 economic development', *World Development*, 23 (4): 691-703.
- Hirst, P. and G. Thompson (1999) *Globalisation in Question: The International Economy and the Possibilities of Governance*, 2nd edition, Cambridge (U.K.): Polity Press.
- Hu, A.G.Z. and G.H. Jefferson (2002) 'FDI impact and spillover: evidence from China's electronic and textile industries', *The World Economy*, 25 (8): 1063-1076.
- Kaiser, S. D.A. Kirby and Y. Fan (1996) 'Foreign direct investment in China: an examination of the literature', *Asia Pacific Business Review*, 2 (3): 44-65.
- Kueh, Y.Y. (1992) 'Foreign investment and economic change in China', *The China Quarterly*, 131: 637-690.
- Lardy, N.R. (1995) 'The role of foreign trade and investment in China' economic transformation', *The China Quarterly*, 144: 1065-1082.
- Lo, D. (1995) 'Techno-economic paradigm versus the market: on recent theories of late industrialization', *Economy and Society*, 24 (3): 443-470.
- Mody, A. and F. Wang (1997) 'Explaining industrial growth in coastal China: economic reforms... and what else?', *World Bank Economic Review*, 11 (2): 293-325.
- Saggi, K. (2002) 'Trade, foreign direct investment, and international technology transfer: a survey', *The World Bank Research Observer*, 17 (2): 191-235.
- Tseng, W. and H. Zebregs (2002) 'Foreign direct investment in China: some lessons for other countries', IMF Policy Discussion Paper PDP/02/3, International Monetary Fund, www.imf.org
- United Nations Conference on Trade and Development (UNCTAD) (1995) *World Investment Report – Transnational Corporations and Competitiveness*, Geneva: United Nations.
- (1999) *World Investment Report – Foreign Direct Investment and the Challenge of Development*, Geneva: United Nations.
- Wei, S. (1994) 'The open door policy and China's rapid growth: evidence from city-level data', in T. Ito and A.O. Krueger (eds.) *Growth Theories in Light of the East Asian Experience*, Chicago: University of Chicago Press.
- Wei, Y., X. Liu, H. Song and P. Romilly (2001) 'Endogenous innovation growth theory and regional income convergence in China', *Journal of International Development*, 13 (2): 153-168.
- Zhan, X.J. (1993) 'The role of foreign direct investment in market-oriented reforms and economic development: the case of China', *Transnational Corporations*, 2 (3): 121-148.

Zhang, K.H. and S. Song (2000) 'Promoting exports: the role of inward FDI in China', *China Economic Review*, 11: 385-396.

Zhang, Q. and B. Felmingham (2002) 'The role of FDI, exports and spillover effects in the regional development of China', *The Journal of Development Studies*, 38 (4): 157-178.

Figure 1. The scale of FDI flows to China, 1979-2005



Sources: 1979-82 figures from Chen *et al.* (1995); all others from *Zhongguo Tongji Nianjian* [China Statistical Yearbook], various issues.

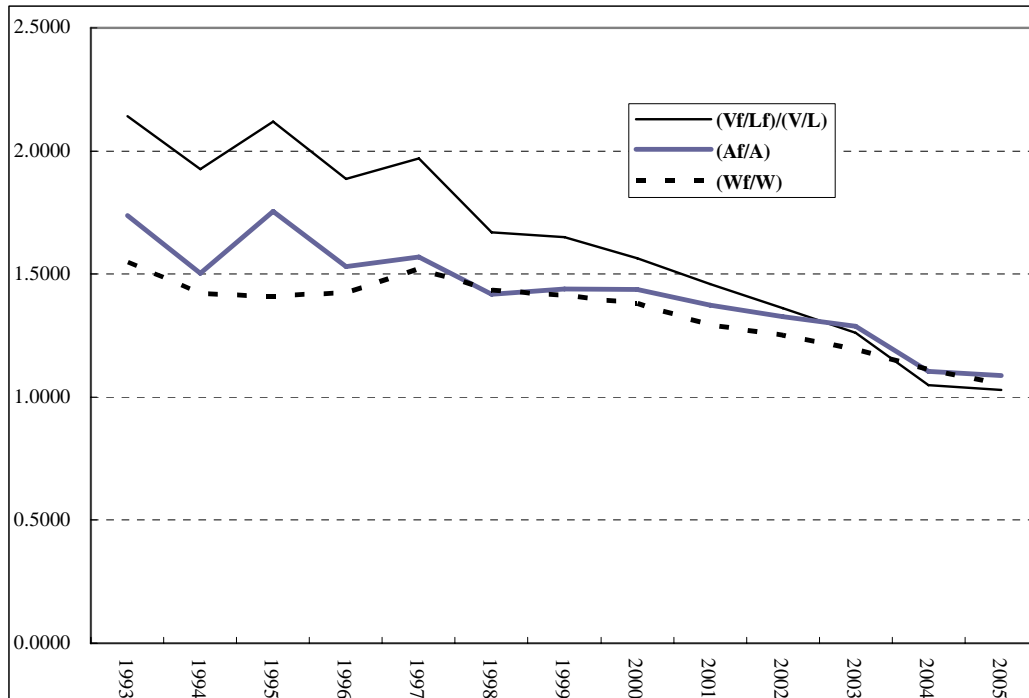
Notes: GFCF = gross fixed capital formation. In calculating the FDI/GFCF ratios, FDI figures are converted into Chinese currency at the year-average official exchange rates.

Table 1. Export and import value of foreign capital-invested enterprises (FIEs), 1985-2005

	Exports		Imports		Balance (US\$ 100m)	Balance of China's Total foreign trade (US\$ 100m)
	Amount (US\$ 100m)	as % of total	Amount (US\$ 100m)	as % of total		
1985	3	1.10%	21	4.97%	-18	-149
1986	5	1.62%	26	6.06%	-21	-120
1987	12	3.04%	34	7.87%	-22	-38
1988	25	5.26%	59	10.67%	-34	-78
1989	49	9.35%	88	14.88%	-39	-66
1990	78	12.59%	123	23.09%	-45	87
1991	123	17.12%	169	26.56%	-46	81
1992	174	20.44%	211	26.23%	-38	44
1993	252	27.51%	418	40.24%	-166	-122
1994	347	28.68%	529	45.78%	-182	54
1995	469	31.51%	629	47.66%	-161	167
1996	615	40.72%	756	54.46%	-141	122
1997	749	40.98%	777	54.59%	-28	404
1998	810	44.07%	767	54.70%	42	435
1999	886	45.47%	859	51.83%	27	292
2000	1194	47.93%	1173	52.10%	22	241
2001	1332	50.06%	1259	51.67%	74	225
2002	1693	52.00%	1624	55.00%	69	304
2003	2403	54.84%	2319	56.17%	84	255
2004	3386	57.07%	3244	57.81%	141	321
2005	4442	58.30%	3875	58.71%	567	1020

Sources: *Zhongguo Tongji Nianjian* [China Statistical Yearbook], various issues; Wang Luolin (ed.) (1997) *Report on Foreign Direct Investment in China*, Beijing, Economic Science Press.

Figure 2. Relative labour productivity, total factor productivity and wage rate of FIEs, 1993-2005



Sources: *Zhongguo Tongji Nianjian* [China Statistical Yearbook] and *Zhongguo Gongye Jingji Tongji Nianjian* [Statistical Yearbook of China's Industrial Economy], various issues. The 1995 L figure for FIEs is from the Third Industrial Census. The 1996 L figure for FIEs is estimated from the 1995 and 1997 figures, assuming that the 1996 growth rate is the same as the average of the two years from 1995 to 1997.

Notes: V = industrial value added (current prices, 100 million yuan); L = labour employment (year average, 10,000 persons); K = Value of fixed-assets net of depreciation (year average, 100 million yuan); V/L = labour productivity (yuan per worker); $A = V / [(L^{0.6})(K^{0.4})]$ = total factor productivity. Figures with no subscript refer to all industrial enterprises; those with subscript "f" refer to FIEs.

Table 2. China's processing trade, 1990-2005

	Exports	Imports	Value-added rate
1990	254	188	26.20%
1991	324	250	22.82%
1992	396	315	20.39%
1993	443	364	17.81%
1994	570	476	16.51%
1995	737	584	20.80%
1996	843	623	26.16%
1997	996	702	29.51%
1998	1045	686	34.33%
1999	1109	736	33.64%
2000	1377	926	32.76%
2001	1474	940	36.26%
2002	1799	1222	32.08%
2003	2419	1629	32.64%
2004	3280	2217	32.40%
2005	4165	2740	34.21%

Sources: *Zhongguo Tongji Nianjian* [China Statistical Yearbook], 2006, table 18-4.

Note: Value-added rate = (exports–imports)/(exports). Exports and Imports values are in US dollar 100 million.