

# Exports, Foreign Direct Investment and Employment: The Case of China

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## 1. INTRODUCTION

**S**EVERAL theories, including the ‘vent for surplus’ thesis (Smith, 1776; and Myint, 1958) and the Staples theory (Innis, 1930 and 1940; and Chambers and Gordon, 1966), have addressed the role of trade in economic development. The former suggests that the opening up of the economy to international trade provides an outlet for surplus productive capacity of the country, and promotes economic growth. The ‘staples’ theory argues that the production and trade of resource-intensive staple products generates linkages and promotes industrialisation. These theories were employed to explain the economic development pattern of the ‘regions of recent settlement’ in the past such as Canada and the United States, the ‘plantation economies’ of Malaysia, and the ‘peasant export economies’ of Ghana and Burma. A feature of all these economies was their endowments of natural resources and exports of primary commodities. Whilst the vent for surplus explanation appears to provide an explanation of the development of natural resource-based economies, could it also explain the growth of a populous country with huge reservoirs of surplus labour such as China?

It could be argued that models which specifically address the issue of surplus labour such as the ‘development with unlimited supplies of labour’ model (Lewis, 1954) provide a much more satisfactory explanation of the development of a surplus labour economy such as China than the vent for surplus model. There are, though, subtle differences between the two explanations. These differences, discussed later, suggest that the vent for surplus explanation may be superior to

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the Lewis-type models in providing an explanation for China's exports and growth. Rima (2004), in fact, argues that China's trade reforms are in line with Verdoorn's Law and the 'vent for surplus' model. Rima's explanation, however, requires empirical evidence and elaboration of the vent for surplus explanation in the context of China's export-led growth. This paper attempts such an explanation.

The paper is organised as follows. Section 2 analyses the 'vent for surplus' model in the context of China. Section 3 discusses the extent and nature of the surplus in China. Section 4 discusses the vent for surplus thesis in the context of exports of township and village enterprises (TVEs) and that of foreign-invested enterprises (FIEs) in China. Section 5 reports on the results of an empirical test of the model. Section 6 concludes.

## 2. THE 'VENT FOR SURPLUS' MODEL

Discussion on exports and growth dates back to Adam Smith who argued that exports could function as a mechanism for utilising surplus resources in the economy, in addition to other dynamic gains it yields. As Smith put it:

Between whatever places foreign trade is carried on, they all of them derive two distinct benefits from it. It carries out that surplus part of the produce of their land and labour for which there is no demand among them, and brings back in return for it something else for which there is a demand. It gives a value to their superfluities, by exchanging them for something, which may satisfy a part of their wants, and increase their enjoyments. By means of it, the narrowness of the home market does not hinder the division of labour in any particular branch of art or manufacture from being carried to the highest perfection. By opening a more extensive market for whatever part of the produce of their labour may exceed the home consumption, it encourages them to improve its productive powers and to augment its annual produce to the utmost, and thereby to increase the real revenue and wealth of society (Smith, 1776, p. 413).

Smith's theory was further developed by Myint (1958) as the 'vent for surplus' (VFS) theory and the 'productivity' theory of international trade. According to the 'vent for surplus' theory, trade provides effective demand for the output of the surplus resources in the economy that would have remained unused in the absence of trade. In other words, international trade may activate dormant or idle resources and draw them into economic activity for export production resulting in an

awakening of domestic resources through the creation of new wants that make people work harder and produce more products for export (Nurkse, 1961).

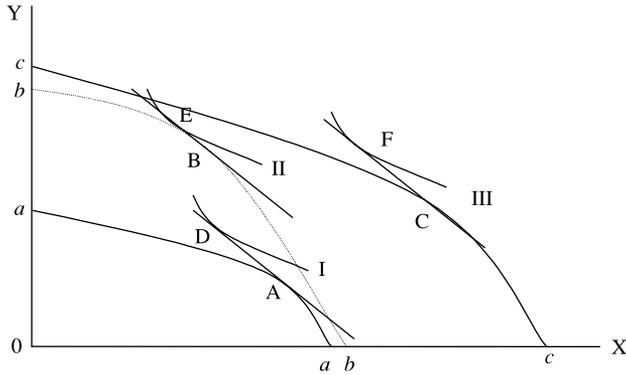
International trade overcomes the narrowness of the home market and provides an outlet for the surplus product over and above domestic requirements. Myint (1958) argues that the 'vent for surplus' approach is much more plausible in explaining the beginnings of trade, while the comparative advantage theory explains the type of goods traded.

According to Myint's (1958) elaboration of the 'vent for surplus' theory, the condition for exports to serve as a 'vent for surplus' is the existence of surplus productive capacity and an inelastic domestic demand for the goods it can produce. In a less developed country, such surplus productive capacity may exist because of a 'disproportion between its production and consumption capacities'. That is, the surplus may not be an absolute surplus relative to needs of an affluent developed society, but surplus relative to the current consumption capacity of a developing country. Therefore, in the 'vent for surplus' model, the major thrust for development is from demand and not supply.

Myint's elaboration of the VFS theory bears careful examination. First, he distinguishes the VFS theory from the traditional HOS-type model of comparative advantage theory. In the comparative advantage theory, the price mechanism would equilibrate demand and supply and eliminate any surplus productive capacity. If land is in surplus relative to labour, wages would increase and rents decline and land-intensive goods would be cheap relative to labour-intensive goods. This would eliminate surplus land. But all this assumes a well-functioning price mechanism that may be absent in an underdeveloped economy and there may be no equilibrating process. Second, the VFS theory emphasises increased production through the deployment of increased volumes of existing resources and not through increased productivity of existing resources. Third, the comparative advantage theory assumes full employment of resources, while the VFS assumes the existence of surplus productive capacity or resources before opening up the economy to trade. Fourth, the VFS theory posits a role for inward flows of foreign capital into the economy with surplus resources. The role of foreign capital here, however, is not so much to augment productivity of existing resources but to develop transport and communications, develop marketing channels and bring into production unused resources. Fifth, surplus capacity may exist in the economy not because of the supply-side factors but more importantly because of an insufficient effective demand for the output of the surplus factor. Finally, lack of effective home demand for the produce of the surplus factor may arise because of the underdeveloped state of the economic organisation in the country. Such economic organisation may include poor transportation and communication facilities and lack of suitable investment opportunities.

The vent for surplus thesis, which argues that the opening up of the economy to international trade and foreign direct investment will provide a vent for the output of surplus resources, can be depicted diagrammatically (Figure 1). Assume there are two factors of production and two goods produced in the economy. Labour ( $L$ ) and capital ( $K$ ) are the two factors, and  $X$  and  $Y$  are the two goods that are labour- and capital-intensive respectively. Given the usual assumptions of constant returns to scale we have the familiar bowed-out transformation curve  $aa$ . The economy produces at  $A$  and consumes at  $D$  by trade. Now allow for inflows of foreign capital into the economy. According to the

FIGURE 1  
Gains from FDI-based Exports with Surplus Labour



Rybczynski Theorem, assuming constant commodity prices, the production and exports of capital-intensive goods Y will increase, and that of labour-intensive goods X will decline if labour supply remains unchanged and labour is fully employed. The transformation curve shifts outwards to *bb* and production shifts to B where output of labour-intensive X decreases and that of the capital-intensive goods increases. When there is surplus labour in the economy, foreign capital utilises the labour to produce additional goods for export. The transformation curve shifts outwards further to *cc* and production shifts to C on the new curve. There is no change in productivity of labour, existing surpluses of labour are utilised to produce goods for export. Such exports enable the economy to consume at F. Note, however, as some of the profits will be repatriated abroad as payments to FDI actual consumption may be below the budget lines II and III.

In this model exports to international markets are crucial for the growth process as there is little demand in the domestic market for the increased output following inflows of foreign capital. The cost of such export-led growth for the economy could be low as the opportunity cost of the surplus labour could be zero provided (1) the volume of surplus labour is large enough to meet the increased demand for labour, and (2) there is no difference in the quality of labour.

It is important to distinguish the vent for surplus phenomenon associated with exports from the Lewis-type models, referred to earlier, which emphasise disguised unemployment in the agricultural sector and the transfer of surplus labour from the agricultural sector to the industrial sector (Lewis, 1954).

The major assumption of the Lewis model is that there are unlimited supplies of labour in the subsistence sector. Labour is unlimited in the sense that the supply curve of labour is infinitely elastic at the existing wage. The marginal product of workers in the subsistence sector is equal to the subsistence wage so that a reduction in the number of workers would not lower the average product of labour in agriculture and might even raise it.

The essential differences between the Lewis-type models and the vent for surplus model should be noted. First, the Lewis model assumes a closed economy and full employment in the industrial sector. Second, there is sufficient effective domestic demand for the increased output so that the production expansion is profitable and generates an investible surplus. Third, labour is in surplus in the subsistence sector because of a relative shortage of land and not because there is insufficient demand for its output. Fourth, the model posits a surplus of investible resources once the transfer process begins. None of these assumptions are present in the Myint-Smith vent for surplus model. It is lack of demand which yields a surplus of resources in the model. More specifically, natural resource-oriented products such as minerals and plantation products, cited by Myint, are not produced because of insufficient demand for such products.

### 3. SURPLUS IN CHINA

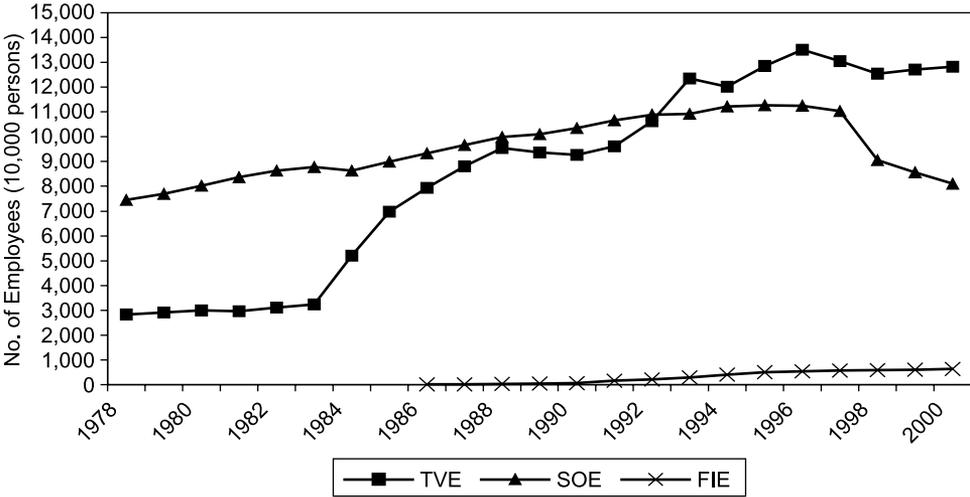
Does the vent for surplus model provide an explanation for the growth of exports and employment in China? Few would dispute the fact that China possesses a reservoir of surplus labour because of her sizeable population. Much of this surplus labour, at least until recently, was in the rural sector and the state-owned industries. Agricultural reforms since 1978 raised labour productivity and changed the production pattern from labour-intensive to less labour-intensive crops. This has further increased the surplus labour supply in rural areas (Taylor, 1988). Surplus labour, though, is found to exist in some villages but not in others (Bowlus and Sicular, 2003). In contrast until 1992 the state-owned industries were the largest source of non-agricultural employment (Figure 2). But much of this was in the nature of disguised unemployment, in the sense that the marginal product of labour was well below the wage rate. Estimates of surplus labour in the SOE sector vary with the definition and data sources. The Chinese official statistics assess surplus labour in some SOEs at around one-third to one-half of the workforce (Fan et al., 1998). It is reported that 'according to the State Commission of Economic System Restructuring, there are over 30 million surplus labourers in SOEs; in many industries, over 30 per cent of workers are surplus; in some industries, the rates reach over 50 per cent'.<sup>1</sup>

The reforms launched in the year 1978 were guided by the objective of 'modernisation of the Chinese economy'; investments were geared towards the adoption of modern, labour-saving technologies. As a result, increased investment in fixed assets in the SOE sector did not draw much labour from the agricultural sector. Growth of employment was not proportional to the rate of capital formation.

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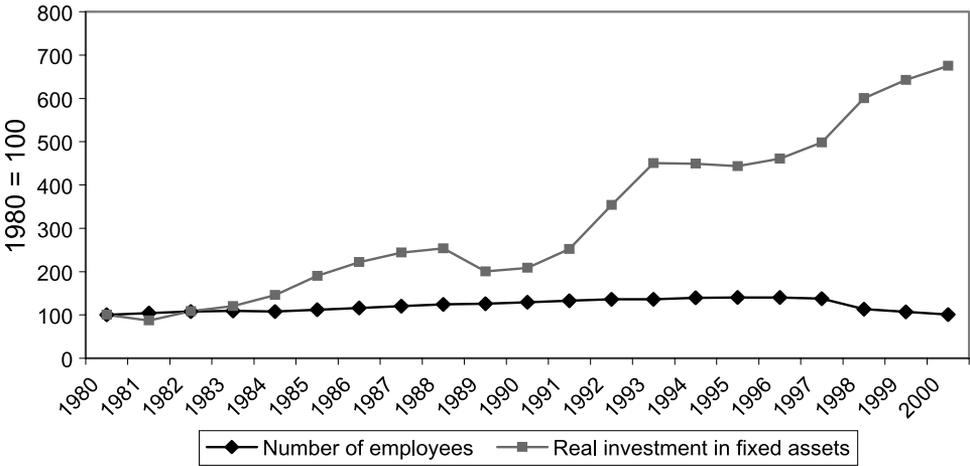
<sup>1</sup> *Economic Evening Paper* (29 November, 1994), cited in Fan et al. (1998).

FIGURE 2  
Employment Distribution in China, 1978–2000



Source: *China Statistical Yearbook*.

FIGURE 3  
Employment Growth and Capital Accumulation in the SOE Sector, 1980–2000



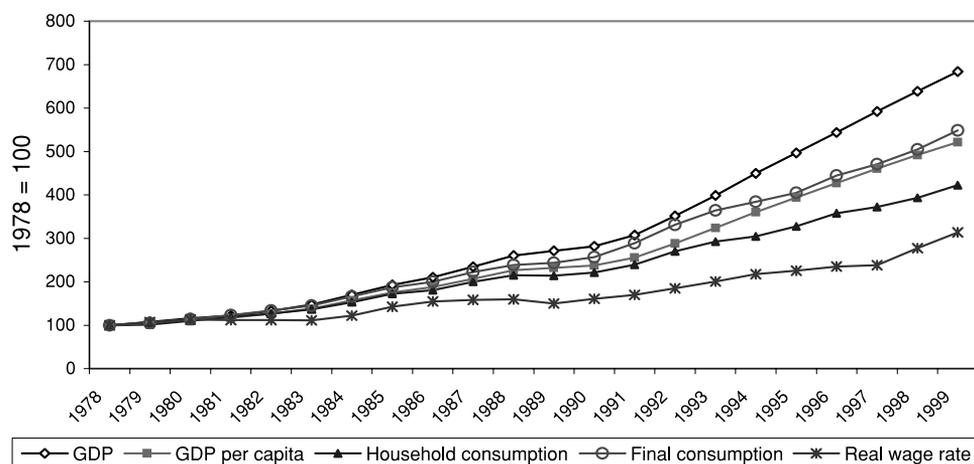
Source: *China Statistical Yearbook*.

Employment growth was left far behind capital accumulation. While capital accumulation in the SOE sector increased by 575 per cent from RMB75 billion to RMB1,650 billion over the period 1980–2000, number of employees in this sector increased only 40 per cent from 75 million to 113 million over the 1978–1995 period, and even began to decrease sharply after 1996 (Figure 3).

Could this reservoir of labour be deemed to be in surplus awaiting an export vent? Myint's conception of surplus resources was in the context of sparsely populated countries with a surplus of land or unexploited mineral resources, and not labour. Even so, it can be shown that China not only possessed surplus labour in the years following liberalisation but also surplus productive capacity in the manufacturing sector. Prior to the reforms the Chinese economy was centrally planned. The industrialisation strategy was centred on heavy industries at the expense of light industrial products, and prices were heavily tilted in favour of the former. Accounting prices were above equilibrium prices for the heavy industries and below the equilibrium level for the light industries (Lin, Cai and Li, 1995). Once the reforms were in place, there was substantial excess capacity in the heavy industries, for example, the iron and steel industry. Low-technology development also resulted in surplus of low-quality, low-technology-content production capacity. This was a structural surplus as it was due to inadequate production structures, a point made by Myint in the context of the nineteenth-century less developed countries.

There was also surplus capacity in the light industries in place due to a lack of effective demand for their products. Over the 1978–1999 period, real gross domestic product (GDP) per capita grew at the average annual rate of 8.3 per cent; the average real growth rate of household consumption and per capita annual disposable incomes were 7.1 and 6.2 per cent per year respectively over the same period (Figure 4). As a result, growth in consumption lagged behind the growth in production capacity.

FIGURE 4  
Output and Consumption Index at 1978 Prices, 1978–1999



Source: *China Statistical Yearbook*.

Moreover, consumer demand was not distributed evenly among the population. The Gini coefficient in China increased from around 23 in 1980 to 40.3 in 1998, compared with that for India from 34 to 37.8 over the same period. In 1998, the top 20 per cent of the population in China possessed about 50 per cent of total income.<sup>2</sup> Incomes of the majority of population did not keep pace with that of growth in total national income. Purchasing power of most people, particularly that of the peasants and the blue-collar workers, continued to be low. This too contributed to the growth in surplus productive capacity.

Such surplus productive capacity was further enhanced by reforms in employment and health care systems, instituted in the absence of social security systems. As increasing bankruptcies occurred with reforms in the SOE sector, millions of workers were laid-off (*xia gang*). In addition, reforms in the health care system gradually eliminated the free medicare system (*gong fei yi liao zhi du*), while the health insurance system was not well established. All this caused uncertainty in people's expectations of the future, and consumption was reduced. Household savings continued to increase despite eight consecutive cuts in interest rates. The consumer price index turned negative in 1998 and 1999. This further enhanced the surplus in production capacity, particularly in consumer product industries.

For these reasons, in most of the major industries, with the exception of the petrochemical industry, around 50 per cent of productive capacity remained unutilised. In 1995, about 40 per cent of steel production capacity was idle, about 75 per cent of dyed cloth production capacity was idle, more than 50 per cent of machinery production capacity was not utilised. Even in the newly developed electrical household appliances industry, about 50 per cent of production capacity was left idle (Table 1). On an average, the share of idle capacity was about 10 per cent higher for consumer goods than for producer goods, which suggests that the lack of strong effective demand was a major factor responsible for the surplus.

Not only was production capacity left idle, inventories also rose considerably. Many firms, mainly the SOEs, were making heavy losses. The gravity of the problem was reflected in Premier Zhu Rongji's speech at the fourth meeting of the Eighth People's Congress in 1996:

The current problems of SOEs are: excessive investments in fixed assets with very low return rates, resulting in the sinking of large amounts of capital, low sales-to-production ratio giving rise to mounting inventories. The end result is that the state has to inject an increasing amount of working capital through the banking sector into the SOEs.<sup>3</sup>

To sum up, soon after the reforms and on until the 1990s, China possessed both surplus labour and surplus productive capacity. Exports provided an effective

<sup>2</sup> Source: 1998 data: World Development Indicator, World Bank. 1980 data: World Income Inequality Database, United Nations (available on <http://www.worldbank.org> and <http://www.undg.org>). In 2001, the Gini index for China even rose to as high as 45.8.

<sup>3</sup> *People's Daily*, Overseas Edition (11 March, 1996).

TABLE 1  
 Idle Production Capacity in the Chinese Manufacturing Sector  
 (Unit: 10,000 unless specified)

<i>Product</i>	<i>Unit</i>	<i>Output</i>	<i>Production Capacity</i>	<i>Per Cent of Idle Capacity</i>
Dyed cloth	100 mil. metre	137	577	76
Sulphuric acid	Ton	1,811	2,138	15
Nitric acid	Ton	56	81	31
Paint	Ton	211	433	51
Dyed cloth	Ton	35	40	13
Plastics	Ton	517	671	23
Synthetic fibre	Ton	166	213	22
Washing liquid	Ton	300	497	40
Tyre (Outer)	Pc	7,945	14,528	45
Tyre (Inner)	Pc	7,349	19,883	63
Cement	100 mil. ton	4.8	6	20
Glass	100 mil. cases	1.6	1.9	16
Steel	100 mil. ton	0.9	1.5	40
Industrial boiler	Ton	12	147	92
Engine	Kw	15,819	36,041	56
Steam turbine	Kw	1,243	12,429	90
Machine tool	Set	20	44	55
Forging press	Set	17	34	50
Oil-refining equip.	Set	2.6	15	83
Forklift	Set	3.3	8.3	60
Bearing	Pc	40	117	66
Truck	Set	145	329	56
<b>Producer Products Average</b>				<b>48</b>
Car	Set	24	52	54
Motorcycle	Set	825	1,490	45
Video camera	Set	4.6	35	87
Computer	Set	84	625	87
Air conditioner	Set	683	2,035	66
Video player	Set	208	517	60
Washing machine	Set	948	2,183	57
Colour TV	Set	2,058	4,468	54
Refrigerator	Set	919	1,820	50
Telephone set	Set	9,956	19,369	49
Bicycle	Set	4,472	8,199	45
Camera	Set	3,326	5,766	42
Vacuum	Set	806	1,284	37
<b>Consumer Products Average</b>				<b>56</b>

Source: *The Third National Industrial Census of China*, 1995. Cited in Hu (1999).

demand for these surpluses. Inflows of foreign capital utilised these surpluses to promote exports of a variety of manufactures. Most of these were mainly imported materials, which were processed with the surplus labour and idle capacity. In addition to the joint ventures in the Export Processing Zones, an important

institutional innovation that allowed foreign capital to exploit the surpluses to produce exportables was the TVEs.<sup>4</sup>

#### 4. EXPORTS OF TVES AND FIES, AND VENT FOR SURPLUS LABOUR

Most TVEs and export-oriented FIEs positioned themselves in the labour-intensive processing or assembly production activities such as apparel, textiles, footwear, toys, and processing and assembling of consumer electronic products. They recruited unskilled cheap labour from the rural sector and skilled workers from the SOE sector. Unlike the state-owned sector, the TVEs and FIEs are market-oriented. They are not subject to central planning. They enjoy a high degree of autonomy of operations. Their production responds to market demand. They recruit and lay-off employees according to market conditions. They are not bailed out by the government if they go bankrupt.

With the gradual opening-up of the economy, TVEs attracted substantial volumes of export-oriented FDI (Table 2). Many of the TVEs and FIEs are export-oriented. They became the major export entities in China in the 1990s. In the year 1999 exports of TVEs reached US\$94 billion, accounting for 48 per

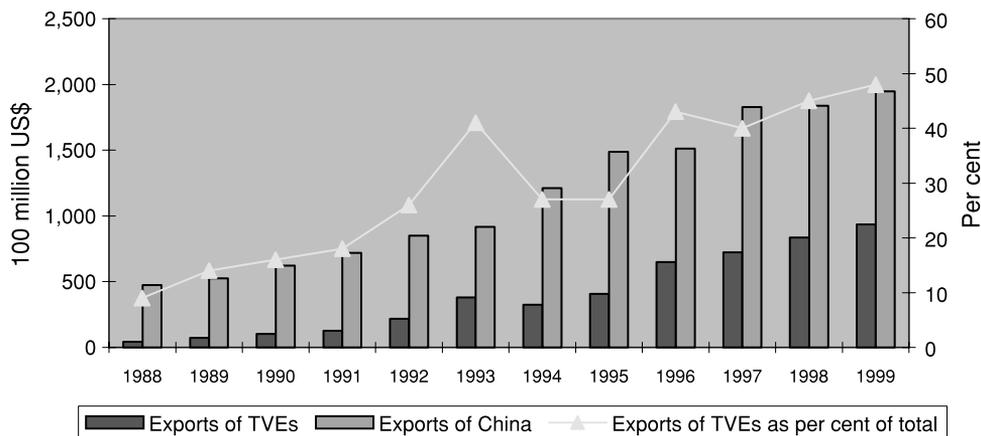
TABLE 2  
Major Exporting Industries of TVEs, 1995

<i>Industry</i>	<i>Export-output Ratio</i>	<i>Export Value (Million US\$)</i>	<i>FDI – Total Capital Ratio</i>
Toy manufacturing	0.70	579	0.54
Computer man.	0.65	193	0.54
Apparel man.	0.54	3,146	0.36
Sport articles man.	0.54	100	0.39
Leather product man.	0.52	1,320	0.41
Watch & clock man.	0.51	91	0.55
Other electric equipment	0.50	63	0.73
Feather product man.	0.47	243	0.28
Hat manufacturing	0.46	29	0.33
Electronic appliance man.	0.44	93	0.67
Knitted product man.	0.41	833	0.33
Footwear man.	0.39	170	0.32
Plastic shoes man.	0.39	61	0.44
Office machines man.	0.36	13	0.40
Electronic parts man.	0.34	276	0.44
Textile	0.22	4,484	0.17

Source: Calculated from *The Third National Industrial Census of P.R. China, 1995*.

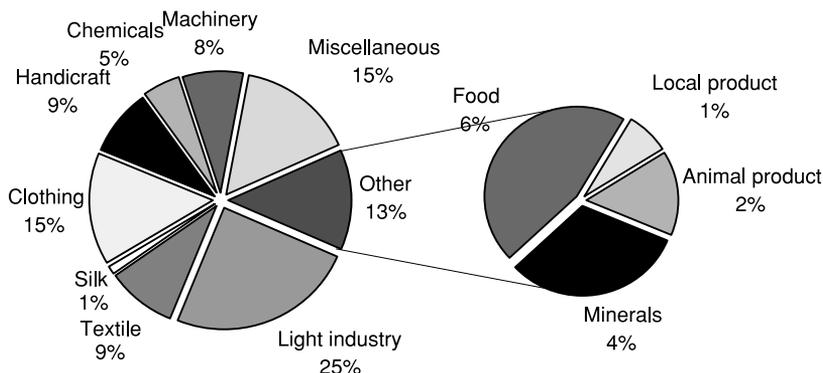
<sup>4</sup> Fu and Balasubramanyam (2003) discuss TVEs and their orientation to exports and FDI in detail.

FIGURE 5  
Exports of Township and Village Enterprises



Sources: SSB, *China Statistical Yearbook*, *Statistical Yearbook of Township and Village Enterprises*.

FIGURE 6  
Export Composition of TVEs, 1999



Source: *China Statistical Yearbook of Township and Village Enterprises*, 2000.

cent of the country's total exports (Figure 5); exports of FIEs amounted US\$89 billion, accounting for 46 per cent of China's total exports.<sup>5</sup> Most of their exports are labour intensive. The proportion of labour-intensive exports in total exports for TVEs was 85 in 1999 (Figure 6). Statistical tests of factor content also suggest that China's exports are labour-intensive (Fu, 2004).

<sup>5</sup> Many TVEs are foreign-funded. So there is an overlap of the TVE and FIE data. Exports of TVEs and FIEs totally accounted for 70 per cent of China's exports. Data source: *Third National Industrial Census of P.R. China*, 1995.

Export-orientation enabled the TVEs and FIEs to overcome the narrowness of the domestic market due to lack of sufficient effective demand, and grew rapidly in the post-reform decades. Expansion of export markets encouraged the TVEs and FIEs to reinvest in production and draw increasing volumes of surplus labour from the agricultural sector. As a result, employment in the TVE and FIE sectors grew rapidly.

It is thus that over the period 1978 to the early 1990s exports of TVEs and FIEs provided a vent for surplus labour in China. In the absence of FDI and exports, labour surpluses and idle productive capacity could not have been absorbed due to inadequate production structures and lack of effective demand. It is in this sense that the model of growth in China during these years approximates to the Myint type of vent for surplus model rather than the Lewis type of labour transfer model.

## 5. EMPIRICAL EVIDENCE

The foregoing analysis suggests that exports may contribute to employment growth in two ways. First, exports provided an outlet for the surplus productive capacity. Second, exports enabled the TVEs and FIEs to grow rapidly with China's surplus labour, and led to growth of employment in these sectors. This section provides some empirical evidence on the employment effect of exports in China.

### *a. Model*

We can examine the impact of exports on labour demand by modelling the employment effects of exports. Following Greenaway et al. (1999) and Milner and Wright (1998), we begin with a Cobb-Douglas production function:

$$Q_{it} = A^\gamma K_{it}^\alpha N_{it}^\beta \quad (1)$$

where  $i$  and  $t$  denote regions and time respectively.  $Q$  is real output,  $N$  is labour input, and  $K$  is capital stock.  $\alpha$  and  $\beta$  represent the factor share coefficients and  $\gamma$  allows for growth of efficiency in the production process. Assuming that firms are profit-maximising, the marginal product of labour equals the wage ( $w$ ) and the marginal product of capital equals its user cost ( $c$ ). Eliminating capital from the equation by solving these equations, we get the following equation:

$$Q_{it} = A^\gamma \left( \frac{\alpha N_{it}}{\beta} * \frac{w_i}{c} \right)^\alpha N_{it}^\beta \quad (2)$$

By taking logarithms and rearranging, we obtain the base labour demand equation as follows:

$$\ln N_{it} = \phi_0 + \phi_1 \ln(w_i/c) + \phi_2 \ln Q_{it} + \varepsilon_{it} \quad (3)$$

where  $\phi_0 = -(\gamma \ln A + \alpha \ln \alpha - \alpha \ln \beta)/(\alpha + \beta)$ ;  $\phi_1 = -\alpha/(\alpha + \beta)$ ;  $\phi_2 = 1/(\alpha + \beta)$ ;  $\varepsilon_{it}$  is a disturbance term which varies across regions and time and possesses the usual properties.

Here we extend the Greenaway-Milner-Wright model by allowing for exports to influence employment in two ways. First, when exports serve as a vent for surplus, export expansion may create increased job opportunities. As output includes both exports and domestic sales we decompose output ( $Q$ ) into real exports ( $X$ ) and net real output ( $DQ$ ). Given the different industry structure of the export and domestic production sectors and the highly FDI-funded feature of the export sector, the labour demand elasticities of exports and domestic production are likely to differ from each other. Therefore, equation (3) is rewritten as:

$$\ln N_{it} = \phi_0 + \phi_1 \ln(w_i/c) + \phi_2 \ln DQ_{it} + \phi_3 \ln X_{it} + \mu_0 T + \varepsilon_{it}. \quad (4)$$

Second, increased openness through export expansion and technology transfer via FDI may promote technical efficiency of the production process due to pressures of competition in the international markets and knowledge spillovers from FDI-funded imports and other foreign contacts. Therefore, parameter  $A$  may be hypothesised to vary with time in the following manner:

$$A_{it} = e^{\delta_0 T} X S_{it}^{\delta_1} FDI_{it}^{\delta_2}, \quad \delta_0, \delta_1, \delta_2 > 0 \quad (5)$$

where  $T$  is time trend,  $XS$  is export penetration index measured by export-output ratio, and  $FDI$  is the inflows of foreign direct investment. Thus the labour demand equation when exports are modelled to impact on efficiency is of the form:

$$\ln N_{it} = \phi_0 + \phi_1 \ln(w_i/c) + \phi_2 \ln Q_{it} + \delta_1 \ln X S_{it} + \delta_2 FDI_{it} + \mu_0 T + \varepsilon_{it}. \quad (6)$$

If there is an export-induced efficiency improvement in the use of labour, the sign of the estimated coefficient of the  $XS$  variable will be negative. And a positive sign on the coefficient of the  $XS$  variable suggests that exports have little impact on labour efficiency. Admittedly, the  $XS$  variable might be positively correlated with the output variable ( $Q$ ) according to the export-led growth hypothesis. However, given the mixed empirical evidence on the export-growth relationship in the extant literature, we can assume that the collinearity between  $XS$  and  $Q$  variables tends to be weak.

To capture the dynamics of employment adjustment in the labour market, a lagged employment variable is introduced into the employment function. A distributed lag structure for other independent variables is also introduced in the employment function to capture the evolution of employment following a change in explanatory variables. Thus, the two employment equations, (4) and (6), are set out in the following form:<sup>6</sup>

$$\begin{aligned} \ln N_{it} = & \phi_0 + \sum_j \phi_{1j} \ln w_{i,t-j} + \sum_j \phi_{2j} \ln DQ_{i,t-j} + \sum_j \phi_{3j} \ln X_{i,t-j} \\ & + \sum_j \phi_{4j} \ln N_{i,t-j} + \mu_0 T + \varepsilon_{it}, \end{aligned} \quad (7)$$

$$\begin{aligned} \ln N_{it} = & \psi_0 + \sum_j \psi_{1j} \ln w_{i,t-j} + \sum_j \psi_{2j} \ln Q_{i,t-j} + \sum_j \delta_{1j} \ln XS_{i,t-j} \\ & + \sum_j \delta_{2j} \ln FDI_{i,t-j} + \sum_j \psi_{3j} \ln N_{i,t-j} + \mu_0 T + \varepsilon_{it}. \end{aligned} \quad (8)$$

### *b. Methodology and Data*

Although the model provides a method for examining dynamic effects, it raises the problem of convergence of the estimators because the lagged dependent variable is correlated with the disturbance term (Greene, 1997). In order to overcome this problem an instrumental-variable (IV) approach has been proposed for estimation. For instance: the instrumental variables estimator proposed by Anderson and Hsiao (1981), GMM estimator proposed by Arellano and Bond (1991), and corrected LSDV approach discussed by Kiviet (1995). Here, we use the two-step GMM method that incorporates all the feasible lags of the dependent variable and other explanatory variables as instruments for the endogenous variables. For purposes of estimation, the employment equations are differenced so as to eliminate the regional specific fixed effects. Because of the short time span of the current data set, one-year lags of the independent variables are included in the model for empirical estimation. Consistency of the GMM estimator requires that no second-order serial correlation exists. So test statistics for this, which are distributed normally under the null of no serial correlation, are calculated and presented in the tables. The validity of the instrument set is also examined using a Sargan test of over-identification restrictions.

Ideally we should examine the employment effects of exports for the whole economy. However, due to the fact that the surplus labour in the SOE sector is in

<sup>6</sup> Following Greenaway et al. (1999) and Milner and Wright (1998), variation of the user cost of capital ( $c$ ) is captured by time dummies in estimation as by assuming perfect capital markets, it will only vary over time.

the nature of disguised unemployment, changes in the number of employees in the SOE sector do not reflect the real impact of export growth on employment. For the FIE sector, there is also a problem of lack of reliable data. Therefore, we estimate the above labour demand model with a panel data set for TVEs in 29 provinces of China over the time period 1987–1998. Admittedly, the TVE sector is only part of the whole economy. However, it is a major dynamic sector that has generated employment growth in China in the past two decades (Figure 2) and it has very little disguised unemployment. As discussed earlier, in the 1990s, the TVEs appeared as an important entity of production, employment and exports in China. They accounted for 47 per cent of total industrial output and 57 per cent of total employment of the economy in 2000, and 48 per cent of total exports in 1999. The data used in this study are collected from the *China Township and Village Enterprises Yearbook* and the *China Agricultural Statistical Yearbook*.  $N$  is measured by number of employees,  $Q$  is measured by value-added deflated by consumer price index (CPI),  $X$  is measured by value of exports deflated by CPI,  $DQ$  is measured by real output net of real exports,  $XS$  is measured by export-output ratio.  $FDI$  is measured by the value of inflows of FDI to capture the possible externalities from FDI. As historical FDI data for TVEs at the regional level are not available, we estimate the value of FDI in TVE sector in region  $i$  by multiplying total FDI received by this region in each year with the share of FDI in the TVEs in this region in 2002, assuming a constant proportion of FDI goes to the TVE sectors for each region.

### *c. Results*

Table 3 reports the estimated results for both the base labour demand specification equation and the extended equation that includes exports and FDI as explanatory variables. The Sargan test for instrumental validity is satisfied and the test for second-order correlation accepts the null hypothesis that there is no second-order serial correlation. Column 1 presents the base specification estimation results. As expected, growth in current wage rates has a negative effect on employment, and growth of current output leads to increased labour demand. Both estimated coefficients are statistically significant at the one per cent level. The estimated coefficient of the lagged dependent variable is negative but statistically insignificant, indicating that employment growth in one year does not have significant effect on the growth potential for the succeeding year.

Column 2 reports the estimated results of the extended model in which real exports volume is included as part of output (equation (7)). The signs and significance of current wage and output coefficients are consistent with those of the base specification equation. The impact of exports on employment is positive. The estimated coefficient of export volume variable is positive and significant at the one per cent level. A one per cent increase in export volume increases

TABLE 3  
Employment Equations for TVEs, 1987–1999

Independent Variables	Dependent Variable: $\Delta LN_{it}$							
	(1)		(2)		(3)		(4)	
	Coefficient	p-Value	Coefficient	p-Value	Coefficient	p-Value	Coefficient	p-Value
$\Delta LN_{i,t-1}$	-0.076	0.196	-0.062	0.298	-0.062	0.298	-0.081	0.163
$\Delta LW_{it}$	-0.206***	0.000	-0.193***	0.001	-0.181***	0.001	-0.162***	0.003
$\Delta LW_{i,t-1}$	0.085	0.149	0.105*	0.078	0.106*	0.076	0.093	0.110
$\Delta LQ_{it}$	0.226***	0.000			0.367***	0.000	0.333***	0.000
$\Delta LQ_{i,t-1}$	-0.096	0.100			-0.036	0.579	-0.065	0.331
$\Delta LDQ_{it}$			0.195***	0.000				
$\Delta LDQ_{i,t-1}$			-0.133**	0.022				
$\Delta LX_{it}$			0.170***	0.000				
$\Delta LX_{i,t-1}$			0.112**	0.022				
$\Delta LXS_{it}$					0.168***	0.001	0.156***	0.002
$\Delta LXS_{i,t-1}$					0.127*	0.012	0.119**	0.022
$\Delta LFDI_{i,t-1}$							0.031*	0.075
$\Delta LFDI_{i,t-1}$							-0.001	0.940
Estimation method	Gmm2		Gmm2		Gmm2		Gmm2	
Time dummies	yes		yes		yes		yes	
Two-step Sargan test	23.43 (54)		24.83 (54)		24.95 (54)		22.90 (54)	
Second-order serial correlation	0.124		0.148		0.125		0.229	
Number of observations	270		270		270		260	

Notes:

\*\*\* Significant at the 1 per cent level.

\*\* Significant at the 5 per cent level.

\* Significant at the 10 per cent level.

employment by 0.17 per cent. The estimated coefficient of the lagged export volume variable is positive and statistically significant as well. This fact indicates that increases in exports provide a not inconsiderable demand for China's surplus labour. The labour demand elasticity of exports is similar to that of domestic production. This fact suggests that exports simply draw upon existing surplus productive capacity and labour and provide a vent for these surpluses.

The relatively low elasticity for exports compared to that for domestic product may be due to the fact that the export sector in the TVEs are mainly FDI-funded. Their production pattern may be much more capital-intensive than that of the domestic sector, and therefore a unit increase in exports draws relatively low volumes of labour compared to that from domestic production expansion. With a total number of employees of 125.4 million for the year 1998 in the township and village enterprises, a one per cent increase in total exports would have created about 213,000 job opportunities in this sector. During the 1998 to 2003 period, TVEs' exports grew at 15.5 per cent per year on average. For a country such as China with a large volume of unemployment, this means about 3 million job opportunities every year in the TVE sector fuelled by its fast export growth.

Columns 3 and 4 present the estimated results for equation (8) that includes export penetration ratio and FDI inflow as an independent variable impacting on employment through efficiency changes. The signs and significance of wage and output variables are consistent with those of the base specification equation indicating the robustness of the specification. The estimated coefficient of the export penetration variable is positive and significant at the one per cent level. This fact suggests that export orientation does not induce increased efficiency in the use of labour when surplus labour is drawn from the informal sector to the export sector. Increased export orientation in the case of China creates increased employment opportunities because most of China's export products are labour-intensive. The estimated coefficient of the FDI variable is positive and significant, indicating the contribution of FDI to employment growth in the TVE sector. Its magnitude and significance level are, however, lower than that for the exports variable. This could be due to (1) the employment multiplier for FDI is not as big as that for exports, and (2) FDI's contribution is captured by the exports variable as they may be closely linked with each other in the TVE sector.

In order to investigate the linkage between FDI and exports, we estimate a dynamic panel model for export growth in the TVE sector. FDI, unit wage cost (COST), output ( $Q$ ), one year lagged dependent variable ( $LX_{i,t-1}$ ) and a time trend ( $T$ ) are included as explanatory variables. Table 4 reports the estimated results. Current FDI and FDI received in the previous year all exert a significant positive impact on TVEs' export growth; the other control variables bear the expected signs. In sum, results from these equations suggest that exports in China, assisted by inflows of FDI, are basically a vent for its surplus labour.

TABLE 4  
The Contribution of FDI to Exports in the TVE Sector

	<i>Dependent Variable: <math>\Delta LX_{it}</math></i>	
	<i>Coefficient</i>	<i>p-Value</i>
$\Delta LX_{i,t-1}$	0.431***	0.000
$\Delta LFDI_{i,t-1}$	0.086***	0.000
$\Delta LFDI_{i,t-1}$	0.079***	0.002
$\Delta LCOST_{it}$	0.086	0.272
$\Delta LCOST_{i,t-1}$	-0.162*	0.059
$\Delta LQ_{it}$	0.191**	0.018
$\Delta LQ_{i,t-1}$	-0.092	0.328
<i>T</i>	-0.003	0.864
Estimation method		Gmm2
Two-step Sargan test		23.27 (65)
Second-order serial correlation		0.127
Number of observations		286

Notes:

\*\*\* Significant at the 1 per cent level.

\*\* Significant at the 5 per cent level.

\* Significant at the 10 per cent level.

## 6. CONCLUSIONS

This paper has analysed the growth of exports and employment in China in the context of the Smith-Myint model of 'vent for surplus'. China is a country with huge reservoirs of surplus labour. For several reasons such as over-investment in the SOE sector, stagnant consumption growth, uneven income distribution and structural distortions, there was also a substantial surplus productive capacity in China in the years following the reforms. Exports provided an effective demand not only for this surplus capacity, but also for its surplus labour. Empirical tests of the model in the paper suggest that, assisted by FDI and the TVEs, exports have successfully provided an effective vent for the surplus productive capacity and labour. Export growth in this way has created considerable job opportunities for a country with a large volume of unemployment. Export expansion in labour-intensive manufacturing industries has also promoted the growth of industrial output and the transfer of large volumes of surplus labour from the agricultural sector to the non-agricultural sector. All this accelerated the process of industrialisation and urbanisation in the Chinese economy.<sup>7</sup>

<sup>7</sup> The proportion of urban population in total population increased from 18 per cent in 1978 to 36 per cent in 2000. Regressing the share of urban population in total population on export growth, the estimation results show that export expansion is positively correlated with urbanisation in China for the time period 1978–1999, and the estimated coefficient export variable is statistically significant. A one per cent increase in the export-GDP ratio raises the share of urban population in total population by 0.345 per cent.

Export expansion in a 'vent for surplus' model results from production expansion through increased inputs of existing resources, but not through increased productivity. Empirical evidence presented in the paper suggests that while growth of exports promoted employment, it did not contribute to growth of productive efficiency. These findings are broadly in line with Myint's interpretation of the 'vent for surplus' thesis propounded by Adam Smith.

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