Regional Differences in the Impact of the Open Door Policy on Income Growth in China

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The analysis shows that exports and income growth rates are highly correlated for the relatively rich coastal provinces with high export shares in national income. The rapid rate of exports growth has not affected growth in the interior region. Because of the regional differences in the degree of economic development and the concentration of exports in the rich coastal region, the differences between the regions appear to be inevitable.

However, it should be noted that the interior region grew more rapidly than in the coastal region and exports expanded also more rapidly in the interior region than in the coastal region. Thus to some extent the interior region's rapid economic growth should be attributed to the rapid growth in exports.

I. Introduction

China's opening to the outside world was perhaps the most visible of its reform of the 1980s. China's international trade volume grew dramatically, it attracted tens of billions of dollars of foreign direct investment. In contrast to the pre-reform era, foreign trde grew more rapidly than the domestic economy.

Development economists have long argued that countries pursuing externally oriented development strategies are more likely to achieve higher rates of economic growth. A number of studies focused their attention on the relationship between exports expansion and economic

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growth by using multicountry samples (e.g., see Michaely (1977), Balassa (1978), Tyler (1981), Feder (1983), Kavoussi (1984), Balassa (1985), Ram (1985)).[1] These literatures have focused on testing the robustness of the findings that indicate a positive effect of exports on growth in the correlation coefficient analysis (Michaely (1977), Balassa (1978), Tyler (1981), Kavoussi (1984)) and in the standard growth accounting framework (Balassa (1978, 1985), Tyler (1981), Feder (1983), Ram (1985)). One of the concerns of this line of research has been to determine whether the positive relationship between exports and output growth is robust to the inclusion of low-income less developed countries (LDCs) in the sample since it has been argued that the evidence for an association between the degree of export orientation and the rate of economic growth in poor countries is extraordinarily weak.

According to Michaely (1977), the positive association of the economy's growth with the growth of the exports share is particularly strong among the more developed countries and does not exist at all among the poorest countries. He concluded that 'growth is affected by export performance only once countries achieve some minimum level of development' (Michaely (1977), p. 52).

While this analysis customary made for developing countries, there is every reason to believe that it should also be relevant for reforming centrally-planned economies. Because of the size and economic diversity of China, it may be possible that exports are having a positive impact in some areas but not others.

The degree of economic development (in terms of per capita natinoal income) is different substantially among regions in China. The trade and foreign investment are highly biased toward the rich coastal provinces. In particular, some coastal areas are moving towards a form of export-oriented development which is in certain aspects similar to that of the newly-industrializing countries of East Asia (Lockett (1989)).[2]

Thus it is of interest to apply Michaely's hypothesis to provinces in China to investigate whether Michaely's view holds for a country such

[1] For an excellent review article on the relationship between exports and growth, see Edwards (1989).

[2] The international experience suggests that the countries changed their trade strategies at some time from an import substitution to an outward-oriented strategy showed dramatic increase in exports and domestic economic growth. See, IMF (1993), pp. 70-80, Krueger (1990), World Bank (1988), pp. 1-17 and Bhagwati and Krueger (1973).

as China, which has many provinces that are larger in population and land size than many countries in the world. Provinces have an average population of 30 to 40 million and some approach 100 million or more. In addition to its large geographical and population size, labor mobility is still hemmed in by numerous government restrictions.[3]

Moreover, each province had considerable power to direct local economic development, especially after decentralization of economic authority to provincial and local levels first in 1958, and again in the late 1960s and early 1970s (Falkenheim (1988)). The Chiense economy after decentralization may be understood as a series of relatively independent economic systems in which inter-provincial resource flows are sharply curtailed and in which provinces rely on internally raised resources (Lardy (1975)). In many cases enterprises obtained most of their inputs from within the province and most of their output was sold to others in the same province. By the 1970s a large proportion of Chinese enterprises were under the authority of the provinces rather than Beijing. Trade between provinces in this decentralized system was handled in a way analogous to foreign trade (Perkins (1988)). State trading firms in the provinces determined what was required from outside the province and the resources available to export in exchange.

Decentralization of economic authority to provincial and local levels is a major feature of the post-Mao reforms. According to Yang (1990), the further decentralization of economic power to lower administrative levels in the reform period has increased the incentives for local governments to keep and process the raw materials within its borders in order to gain the value added themselves.

The objective of this paper is to provide some empirical evidence on whether there are substantial differences in the relationship between exports and economic growth among regions in China; and also examine whether this relationship is significantly affected by the level of economic development. The data used in this study are the provincial level data from 1984 to 1990 for 28 of the 30 provinces in China.[4] Pro-

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[3] Labor market rigidities in China were the results of the system of job assignments and life time employment, enterprise-based welfare programs (including housing and pensions), and restrictions on geographical labor mobility. In order to increase the flexibility that enterprises have in managing their labor force, a contract labor system was introduced in 1986 under which all new workers in state enterprises, with a few exceptions, have been hired on contractual basis for a period of usually three to five years. In 1987, contract workers accounted for 8 percent of the total workers in state enterprises. See, Blejer et al. (1991).

[4] The choice of the period was dictated by the availability of provincial exports and

vincial national income (NI) per capita is used to indicate the level of economic development in each province.

This paper proceeds as follows: Section II explains the methodology and model. The data used in the empirical evaluation are briefly summarized in Section III. Section IV investigates whether the relation of exports and growth is affected by the degree of economic development and also examines whether the relationship is different between the regions. Finally, section V presents concluding remarks.

II. Methodology and Model

A. Methodology

To examine whether Michaely's hypothesis holds for a China, the sample is ranked according to the level of per capita NI in 1990, and then equally divided (admittedly, in an arbitrary fashion) into two groups, high- and low-income provinces. Those provinces with per capita income of 1,126 yuan or less (about $235 in 1990) are assigned to the poor-income category, and those with per capita income of more than 1,126 yuan are classified as rich-income provinces.

The average annual growth rate of exports for the period 1984-90 is used as an index of export orientation (column 2 of Table 1), and the average annual growth rate of national income per capita for the period 1984-90 is utilized to measure economic performance (column 4 of Table 1). Michaely (1977) argues that the variable used to represent export performance must indicate the extent of export bias; that is, it must refer not to the absolute level of exports but to the proportion of exports in the product. Following Michaely, the average annual changes in ratio of exports to NI is also used to represent export performance (column 3 of Table 1).

To analyze the regional differences in the impact of open door policy on income growth we treat China as two separate group of countries, a coastal group state and an interior group state.[5] The

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foreign direct investment data. But the year 1984 has an important meaning because in September 1984, the State Council issued a new set of reform documents for the foreign trade sector. For the MOFERT's report on reform of the trade system, see *DJMNJ* ((1985), pp. 388-398). Tibet is excluded because of the lack of data availability. Hainan Island, which was established as a separate province in 1988, was included in Guangdong province.

[5] During the Seventh Five-Year Plan (1986-90), the country was divided into the

Table 1

THE SHARE OF EXPORTS AND THE RATE OF GROWTH

Province	Mean level of Export/NI[a]	Mean annual change of Export[b]	Mean annual change of Export/NI[b]	Mean annual change of per capita NI[c]
1. Beijing	12.30	13.86	12.45	4.41
2. Tianjin	27.50	8.90	9.73	2.39
3. Hebei	10.08	16.69	14.00	5.69
4. Liaoning	27.06	4.85	4.79	4.52
5. Shanghai	30.81	7.19	10.07	0.69
6. Jiangsu	8.98	11.86	9.64	6.21
7. Zhejiang	9.39	20.23	16.78	8.33
8. Fujian	14.59	32.85	24.82	9.31
9. Shandong	12.85	8.58	6.30	5.51
10. Guangdong	28.30	28.93	23.39	10.12
11. Guangxi	8.11	14.93	11.80	6.75
Coastal region	17.28	15.32[d] (11.92)[e]	13.07 (9.06)	5.81 (5.11)
12. Shangxi	5.24	18.95	21.01	2.91
13. Neimenggu	4.88	28.53	25.37	6.04
14. Jilin	7.58	22.60	23.00	5.11
15. Heilongjiang	6.58	22.37	22.07	4.55
16. Ahnhui	4.26	18.16	16.90	5.14
17. Jiangxi	5.93	15.43	12.13	6.09
18. Henan	4.04	16.83	13.47	5.52
19. Hubei	6.20	16.62	15.51	4.16
20. Hunan	4.92	11.83	10.22	5.58
Central region	5.51	19.03 (15.75)	17.74 (13.0)	5.01 (4.70)

eastern or coastal region, the central region, and the western region (Hsu (1991)). The coastal region includes 12 provincial units (Beijing, Tianjin, Shanghai, Liaoning, Hebei, Zhejiang, Jiangsu, Shandong, Fujian, Guangdong, Guangxi, and Hainan province). The central region includes 9 provincial units (Anhui, Jiangxi, Jilin, Heilongjiang, Shanxi, Neimenggu, Hubei, Henan, and Hunan province). The western region includes 9 provincial units (Sichuan, Guizhou, Yunnan, Shaanxi, Ningxia, Qinghai, Tibet, Gansu, and Xinjiang). The interior region includes both of the central and western regions. We use the word "province" to denote any one of the provincial-level administrative units, including: provinces, centrally administered municipalities, and autonomous regions. It must be pointed out that there exists different regional classifications for China. We have simply adopted the one promulgated in the Seventh Plan.

Table 1 (Continued)

Province	Mean level of Export/NI[a]	Mean annual change of Export[b]	Mean annual change of Export/NI[b]	Mean annual change of per capita NI[c]
21. Sichuan	3.46	33.45	31.62	6.14
22. Guizhou	2.06	27.63	26.47	4.06
23. Yunnan	5.44	31.44	24.47	8.68
24. Shaanxi	4.30	31.57	28.86	6.03
25. Gansu	2.92	27.19	24.75	6.11
26. Qinghai	3.72	30.00	26.54	6.55
27. Ningxia	5.79	25.40	22.62	6.03
28. Xinjiang	6.57	12.70	6.78	7.76
Western region	4.28	27.42 (23.88)	24.01 (20.7)	6.42 (6.25)
Interior	4.93	22.98 (17.9)	20.69 (15.5)	5.67 (5.35)
Total	9.78	19.97 (12.93)	17.70 (10.3)	5.70 (5.21)

Notes: a: The variable is average annual share of exports in NI for the period 1984-90.
   b: The variable is average annual growth rate in nominal terms for the period 1984-90.
   c: The variable is the average annual growth rate of real per capita NI for the period 1984-90. The nominal per capita income was divided by the overall NI deflator (1980 as base year).
   d: Both regional and national data are means of the disaggregated data.
   e: Both regional and national date are means of the aggregated data.
Sources: Calculated from *TJNJ*, 1986, 1987, 1988, 1989, 1990, 1991 and *DJMNJ*, 1986, 1987, 1988, 1990, 1991.

coastal group state includes the 11 coastal provinces and the interior group state includes 17 central and western provinces. The coastal group state is relatively poor in natural resources except for some on- and off-shore petroleum reserves, but by 1950 it had acquired a manufacturing base after several decades of import substituting industrialization, particularly in textiles (World Bank 1990), Ch. VIII). The coastal state also had most of the transport and other infrastructure needed for industrialization and a more than proportionate share of China's most educated people. The interior state, by way of contrast, possessed most of the natural resources but little infrastructure of any kind and a population that was poorer and less well-educated.

By the early 1970's, the interior provinces redoubled their support of import substitution in the consumer goods sector by effectively banning most imports (World Bank (1990, p. 196)). The coastal region, on the other hand, broadened the scope of its own development to embrace the capital goods industry as well, further increasing its dependence on raw materials imported from the abroad. As they gained in experience, coastal consumer goods industry began seeking export, not to China's interior, but to foreign countries. Even before the reforms of 1979, the coastal China was moving in the direction of the East Asian NICs. Interior China in the pre-reform period was, for lack of a better analogy, a very poor version of the Soviet Union's economy of the 1930s or the 1950s.

B. Model Specification for Regression Analysis

We estimate a simple model in which the annual income per capita growth (RPCNI) in each province over the period 1984-90 is a function of exports growth rate, foreign direct investment, and initial income per capita. The annual growth rates of exports (REX) are included to see whether exports have predictable effects on the Chinese economy as traditional theorists claim.

Following Kormendi and Meguire (1985), Grier and Tullock (1989), Barro (1991), Zind (1991), Gregorio (1992), Blömstrom and Zejan (1992), and Helliwell (1992), we also introduce initial levels of income per capita (PCNI84) to see whether poor provinces tend to grow faster than rich ones. Kormendi and Meguire (1985) found a highly significant negative relationship between initial income and growth rate of income in 47 countries during 1950-77. Grier and Tullock (1989) found this relationship is positive and significant in 89 countries during 1961-80, while negative and strongly significant for 24 OECD countries during 1951-80.

Zind (1991), using 89 LDCs in Africa, Asia, and Central and South America during 1960-80, argued that per capita income converged within a subsample of 32 countries which had more than $800 income in 1960, leading him to conclude that the "convergence club" consisted of 32 LDCs and hence that 57 were excluded from it. However, Blömstrom and Zejan (1992) found that the covergence was particularly strong among the poorest half of the developing countries when using 78 developing countries during 1960-85, thus contradicting the idea of a "convergence club" confined to relatively well-off countries.

Baumol (1986) found an inverse relationship between levels of

per capita income in 1950 and the rate of GDP per capita growth during 1950-80 among 16 OECD countries whereas the inverse relationship did not exist in less developed countries. Baumol, in particular, found an inverse relationship among 9 centrally planned economies (CPEs) including China, and stated that "the CPEs are members of a convergence club of their own, though convergence within this group is less pronounced than OECD countries" (Baumol (1986), p. 1079). Helliwell (1992) confirms that the convergence model generally applicable to the OECD and in augmented form to global samples fails to reflect the experience of 13 Asian economies during 1960-1985. Growth is not higher in the poorer Asian countries. Among the OECD countries, by contrast, growth has been higher in those that were initially poorer. He also found that the more open economies generally have significantly faster growth rates in Asian countries.

In addition, foreign direct investment (FDI) is included in the regressions to determine the effects of flows of foreign investment on economic growth. The FDI rate used here is the share of FDI in NI. Foreign investment affects economic growth by stimulating the domestic economy and creating new industries. The effect of flows of foreign investment on economic growth is predicted to have a positive effect. Gregorio (1992) found that foreign investment was three to six times more efficient than total investment in 12 Latin American countries during the period 1950-85.

However, Hein (1992) found that a short-term (1970-73) foreign investment had no effect on economic growth in 41 developing countries during the period 1973-82. Blömstrom and Zejan (1992) argued that inflows of direct investment were an important influence on growth rates for developing countries, but not for lower income ones when using the 78 developing countries during 1960-85.

This specification gives rise to the estimation equation

$$RPCNI_{it} = a_0 + a_1 REX_{it} + a_2 PCNI84_i + a_3 FDI_{it} + a_4 T_t + e_{it}$$

where the a's are the parameters to be estimated, T_t is time trend, and e is the error term. The province-level panel data from 1984 to 1990 for 28 Chinese provinces are used. It produces 168 total observations for analysis. We have 66 observations for the 11 coastal and 102 observations for the 17 interior provinces. The main concern is to see whether the effects of exports on the economic

growth are different between the coastal and interior regions. We expect that exports have a significant effect on income growth only in the richer coastal regions.

III. The Data for the Chinese Provinces

A. Chinese National Income (NI) Data

The data for per capita national income for the provinces are found in State Statistical Bureau (SSB), *Guomin Shouru Tongji Ziliao Huibian (A Collection of Chinese National Income Statistics) 1949-1985*, 1987 and SSB, *Zhongguo Tongji Nianjian (Statistical Yearbook of China)*, 1988, 1989, 1990, 1991. We lack useful measures of price levels or price indexes for individual provinces. Therefore, we deflate the nominal values for each province by the national income deflator obtained as the ratio of national income in current price to a real national income index with 1980 = 100. All these data are provided by the SSB. *Zhongguo Tongji Nianjian (Statistical Yearbook of China)*, 1991. Since we use the same price deflator for each province in a single year, the particular deflator that we use affects only the constant terms in the subsequent regression analysis.

B. Exports and Foreign Direct Investment (FDI)

In 1984, MOFERT published *Zhongguo Duiwai Jingji Maoyi Nianjian (The Almanac of China's Foreign Economic Relations and Trade)* for the first time. However, the provincial exports data were officially tabulated from the 1986 edition in which the data for the years 1984 and 1985 are available. The provincial exports data for the period 1984-90 are found in 1986 (p. 966), 1987 (p. 1141), 1988 (p. 369), 1989 (p. 317), 1990 (p. 306), and 1991 (p. 336).

The provincial foreign direct investment (actually utilized) data for the period 1985-1990 are available in SSB, *Zhongguo Tongji Nianjian (Statistical Year Book of China)*, 1986, (p. 501), 1987 (p. 605), 1988 (p. 735), 1989 (p. 647), 1990 (p. 651), 1991 (p. 631).

IV. Empirical Results

A. Correlation between Exports Expansion and Economic Growth

Simple correlation coefficients between exports expansion and in-

come growth are reported in Table 2 for the entire sample of 28 provinces as well as its various subsamples. In the total sample the coefficient of correlation between exports expansion and economic growth is positive and significant. It is interesting to note that the positive association of the growth rate of income and exports appears to be particularly significant among the rich provinces, and not to exist at all among the poor provinces. In the first group of rich provinces, the correlation coefficient of the two variables is found to be 0.695 (significant at 5 percent level); whereas in the second group of poor provinces, it is 0.315 and not statistically significant.

The result obtained by using Michaely's measure of exports (average annual increase in the share of exports in NI) for the rich province also shows positive and significant (the correlation coefficient is 0.443), whereas the correlation coefficient for the poor group is practically zero (0.070). This supports the Michaely's finding that a minimum threshold of development is needed before export growth and economic growth are associated. However, it is necessary to note that when one ranks 28 provinces in order of per capita income of 1990, all coastal provinces, except the Guangxi provinces, are included

Table 2

CORRELATION COEFFICIENT BETWEEN RATES OF GROWTH
IN PER CAPITA NI AND EXPORTS, 1984-90[a]

Province group	Number of Observations	Correlation Coefficients[b]	Correlation Coefficients[c]
Total sample	28	0.524*	0.290
Rich provinces	14	0.695*	0.443**
Poor provinces	14	0.315	0.070
Coastal region	11	0.842*	0.735*
Interior region	17	0.252	−0.033

Notes: *: significant at 5 percent level.
       **: significant at 10 percent level.
       a: Tibet is excluded.
       b: correlation coefficients between average annual rates of growth in real per capita NI and average annual rates of growth in exports (in nominal terms) for the period 1984-90.
       c: correlation coefficients between average annual rates of growth in real per capita NI and average annual increase in the share of exports in NI for the period 1984-90.

in the richest 14 provinces; of the 14 richest provinces, 10 are in the coastal region.

As seen in Table 2, for the coastal region, there is a strong correlation between export orientation and growth (the correlation coefficient is 0.842). The Michaely measure of exprots expansion is also positive and highly significant in the coastal region (the correlation coefficient is 0.735). The results obtained from the coastal region show a higher correlation than those of the rich provinces. Since it has been argued that scale effects and gains from increased capacity utilization are mainly relevant for manufacturing industries (Balassa (1978)), the differences may be explained by reference to the heterogeneity of the sample included in the rich provinces that include the provinces such as Xinjiang and Jilin, which rely chiefly on primary exports. Exports expansion in the interior region is not related to the income growth. The correlation coefficient of the inland is positive, but not significant (0.252) when using annual change in the export, while it is almost zero (−0.03) when using the Michaely measure.

These results indicate that there are substantial differences in the relationship of exports and growth between regions. These different results between the coastal and interior regions may be explained by the share of exports in NI. As seen in column 1 of Table 1, the level of the ratio of exports to national income in the coastal region is higher than in the interior region. The mean exports share (exports/NI) in the coastal region was 17 percent for the period 1984-1990, while it was only 5 percent in the interior region. Thus exports account for only a small fraction of income in the interior provinces.

When one ranks the provinces in order of share of exports in national income for the period 1984-90, one finds that all the 11 coastal provinces are included in the 11 provinces with the higher exports share in national income. Moreover, only one province (Guangxi) of the fourteen provinces with the highest share of exports in national income is not among the richest 14 provinces. And also it may be noted that most of the provinces at the top of the list of those which enjoyed rapid export growth also manifest — as an average for the period as a whole — relatively low levels of the export proportion. Thus, of the 10 provinces at the top of the list of rapid export growth experience economies — Sichuan, Fujian, Shaanxi, Yunnan, Qinghai, Guangdong, Neimenggu, Guizhou, Gansu and Ningxia (in order of rate of export growth) — only two coastal provinces, Fujian and Guangdong, are found also at the top of the list of the ten highest exports proportion economies. The eight interior provinces with the highest rate of in-

crease of exports are not found also at the top of the list of rich economies.

This suggests that export and income growth rates are most highly correlated — and only significantly correlated — for the relatively rich coastal provinces with high export shares in national income. The differences in the association between income and exports growth among the regions are innevitable because of the regional differences in the degree of economic development and the concentration of exports in the rich coastal region.

B. Regional Differences

Table 3 contains the results of estimating our model for the coastal region, while the interior results are presented in Table 4. When these two data sets are constrained to have the same slope coefficients in Regression (4), the F-statistic testing the appropriateness of combining the data is 5.29 which is significant at the 5 percent significant level and thereby rejects pooling the two groups of regions in a single sample.[6] A comparison of the two tables reveals the following major differences:

(1) In the coastal, the coefficients of exports expansion have a positive and significant as expected (Regressions (1), (2), (4), and (5) in Table 3). In the interior the coefficient is positive but not significant (Regressions (1), (2), (4), and (5) in Table 4). The results confirm the findings of Michaely (1977) and Helleiner (1986), and are consistent with the correlation coefficients analysis between exports expansion and economic growth in Section 4.1. As indicated in the previous section, export is only a very small fraction of national income in the interior (about 5 percent), while it is more than 17 percent in the coastal region. Moreover, most of the interior provinces enjoying rapid export growth also have low levels of the export share in national income as well as have low levels of per capita income.

However, it must be recognized that in the reform period all regions in China have seen significant economic growth. Economic growth has been widespread all over the country. The interior provinces have also experienced rapid economic growth in the 1980s (see

[6] The regression equation for the whole China is:
$$RPCNI = 0.12 + 0.016*REX - 0.028*PCNI84 + 0.55*FDI - 0.014*Time$$
$$(10.66)\ (0.82)\ (3.58)\ (1.68)\ (7.00)$$
$$R^2 = 0.31,\ N = 168$$

Table 3

REGRESSIONS FOR THE COASTAL REGION

	(1)	(2)	(3)	(4)	(5)
Dep. Var.	RPCNI	RPCNI	RPCNI	RPCNI	RPCNI
constant	0.120	0.150	0.163	0.150	0.121
	(9.06)*	(10.09)*	(11.40)*	(10.10)*	(8.07)*
REX	0.102	0.075		0.068	0.105
	(3.11)*	(2.44)**		(2.20)**	(3.21)*
PCNI84		−0.020	−0.033	−0.030	
		(3.51)*	(4.06)*	(3.60)*	
FDI				0.291	0.121
				(0.86)	(0.72)
Time Trend	−0.022	−0.022	−0.021	−0.023	−0.023
	(6.78)*	(7.28)*	(6.80)*	(6.65)*	(6.12)*
N	66	66	66	66	66
R^2	0.45	0.54	0.50	0.62	0.48

Notes: Numbers in parentheses below the coefficient estimates are t-statistics.
     *: significant at 1 percent.
     **: significant at 5 percent level.
Symbols:
Dependent variable; annual rate of growth in real per capita NI (RPCNI), 1984-90. NI is deflated by overall NI deflator (1980 as the base year).
Independent variables;
REX = annual growth rates of exports (in nominal terms), 1984-90.
PCNI84 = NI per capita in 1984, devided by overall NI deflator (1980 = 100).
FDI = foreign direct investment as a percent of NI, 1985-90.

Table 1). "Domestic" reforms or "economic spread effects," cannot, however, account for every aspect of the interior region's economic development pattern during the post-reform period. For example, certain provicnes such as Xinjiang and Yunnan were too far away from metropolitan areas to expect to benefit from the "spread effects," and yet they grew substantially more rapidly than the national average. Could the interior region grow more rapidly than in the coastal region in the post-reform period without a faster growth in exports than in the coastal region?

Most of the provinces with the highest rate of increase of exports are found in the interior region. Exports grew 23 percent per annum in

the interior region during 1984-90, while the coastal region's exports grew 15 percent per annum in the same period. As can be seen in Table 1, the far interior provinces such as Sichuan, Yunnan, Shaanxi, Gansu, Qinghai, and Ningxia which enjoyed rapid rate of export growth are also included in the top performers in economic growth. Thus it cannot say that the interior region could grow more rapidly than the coastal region without a faster growth in exports than in the coastal region.

(2) Initial income has a negative and significant coefficient in the coastal provinces (Regression (3) in Table 3). A negative regression coefficient estimate means that provinces with lower 1984 national income achieved higher growth rates than provinces with higher national income and thereby implies income convergence. The result shows evidence of convergence in the coastal region, that is poorer provinces tend to grow faster than rich ones. When one ranks the coastal provinces in order of per capita national income in 1984, one finds that the richest 4 provinces such as Shanghai, Beijing, Tianjin, and Liaoning (in order of per capita income in 1984) tended to grow more slowly than the national average during the 1984-90, while most of the provinces (Guangxi, Fujian, Guangdong, and Zhejiang) at the bottom of the list of per capita income in 1984 enjoyed rapid growth.

The coefficient of initial income has a negative but not significant in the interior region (Regression (3) in Table 4). This shows no statistically significant convergence among interior provinces, although the relationship is negative within the group. In fact, the five interior provinces (Xinjiang, Ningxia, Qinghai, Jiangxi, Neimenggu) of the 10 provinces with the highest per capita income in the interior region in 1984 are found also at the top of the list of rapid economic growth provinces, while the 4 provinces of the 7 poorest provinces in the interior grew faster than the national average rate of growth. Thus convergence in the interior region is not straightforward.

(3). Foreign direct investment has a positive, but not significant effect in both of the coastal and the interior regions (Regression (4) and (5) in Table 3 and Table 4). Foreign direct investment is strongly correlated with exports expansion in the coastal region (the correlation coefficient is 0.239, significant at 5 percent level), while it is not correlated with exports in the interior (the correlation coefficient is 0.041). This indicates that FDI affects the rate of exports growth directly and thereby the rate of income growth indirectly in the coastal region.

One of the Chinese government's objectives of maximizing foreign direct investment is to promote exports. Accordingly, an important

criterion for judging the performance of FDI in China is the ability of the foreign-funded enterprises to export their output. According to Kueh (1992), most foreign-funded enterprises including equity joint ventures, cooperative joint ventures and wholly foreign-owned ventures have targeted their output towards world markets and thus China's export-oriented foreign investment strategy has been implemented fairly consistently within the coastal region. In the coastal area *Sanzi* (three-foreign-funded) enterprises' share in total exports rose from 7 percent in 1988 to 20 percent in 1991.[7]

One might assume that the coastal region's results are dominated by the dominant role of the 'Fifth Dragon' Guangdong which had the

Table 4

REGRESSIONS FOR THE INTERIOR REGION[a]

	(1)	(2)	(3)	(4)	(5)
Dep. Var.	RPCNI	RPCNI	RPCNI	RPCNI	RPCNI
constant	0.087	0.108	0.115	0.106	0.086
	(6.16)*	(4.52)*	(5.62)*	(4.39)*	(5.91)*
REX	0.018	0.015		0.015	0.015
	(0.70)	(0.57)		(0.55)	(0.58)
PCNI84		−0.043	−0.046	−0.042	
		(1.08)	(1.15)	(1.05)	
FDI				0.710	0.790
				(0.48)	(0.54)
Time Trend	−0.011	−0.010	−0.010	−0.010	−0.010
	(3.41)*	(4.26)*	(3.46)*	(3.50)*	(4.24)*
N	102	102	102	102	102
R^2	0.16	0.16	0.17	0.17	0.14

Notes: a: Tibet is excluded. Numbers in parentheses below the coefficient estimates are t-statistics. See Table 3 for the definition of variables.
*: significant at 1 percent.

[7] Kueh (1992) argues that if the other coastal provinces can effectively emulate the success stories of Guangdong or Fujian in accordance with the export-oriented foreign investment strategy, the *Sanzi* share in national exports may be expected to increase to around 30 percent by the middle of the 1990s.

fastest growth among all the provinces. During the 1984-90 sample period, the average Guangdong growth rate was 10.1 percent, which is 4.3 points above the average of the coastal region (see Table 1). However, when an interactive term, REX*DUMGUA (dummy for Guangdong) is included in the regression (2) in Table 3, REX*DUMGUA is positive, but not significant, and REX remains significant at 5 percent level. That is,

$$RPCNI = 0.119 + 0.063 \text{ REX} - 0.027 \text{ PCNI84}$$
$$\quad\quad (9.98) \quad (1.96) \quad\quad\quad (3.41)$$
$$+ 0.087 \text{ REX*DUMGUA} - 0.021 \text{ Time}, \ R^2 = 0.56$$
$$\quad (1.44) \quad\quad\quad\quad\quad\quad\quad (7.24)$$

When another interactive term for the Fujian province which has grown 9.3 percent during the period 1984-90 is added to the above equation, the coefficient of the rate of export growth becomes insignificant and the coefficients of the interactive terms become positively significant at 10 percent level. That is,

$$RPCNI = 0.147 + 0.036 \text{ REX} - 0.025 \text{ PCNI84}$$
$$\quad\quad (10.03) \quad (1.03) \quad\quad\quad (3.16)$$
$$+ 0.114 \text{ REX*DUMGUA} + 0.092 \text{ REX*DUMFUJ}$$
$$\quad (1.85) \quad\quad\quad\quad\quad\quad (1.71)$$
$$- 0.021 \text{ Time}, \ R^2 = 0.58$$
$$\quad (7.35)$$

where DUMFUJ is a dummy for the Fujian province.

This indicates that to some extent the effects of exports on growth is dominated by two leading provinces which include 4 SEZs, three open coastal cities, and the Coastal Economic Development Zones of Xiamen—Zhangzhou—Quanzhou Triangle and Pearl River delta. This two provinces generated 28 percent of total exports in 1990 and accounted for 52 percent of total FDI for the period 1985-90.

C. Population Weighted Regressions

The results in Table 3 and Table 4 give each province equal weight in determining coefficients regardless of their relative size. For example, Tianjin (8.84 millions of population in 1990) and Shandong (84.93 million in 1990) in the coastal region and Qinghai (4.48 million in 1990) and Sichuan (108.04 million in 1990) in the interior region have

an equal opportunity to influence the results despite their staggering population size differentials. As a check on the stability of our results, Table 5 presents population weighted regression for the coastal and interior regions.

Table 5 shows that the basic flavour of our results carries through to the population-weighted regressions. In the coastal region, the coefficients of exports effect are slightly bigger and stronger and the coefficient of convergence effect is slightly smaller and less significant (Regression (1) and (2) in Table 5) than Regressions (2) and (4) in Table 3. In the interior region, both of the coefficients of exports effect and convergence effect become larger and the t-statistics are slightly improved (Regression (3) and (4) in Table 5). R^2 for the interior region is improved from 0.16 to 0.32, while it is not improved for the coastal provinces. Otherwise the results are largely the same.

Table 5

POPULATION WEIGHTED REGRESSIONS

	Coastal Region		Interior Region[a]	
	(1)	(2)	(3)	(4)
Dep. var.	RPCNI	RPCNI	RPCNI	RPCNI
constant	0.140	0.140	0.106	0.105
	(8.79)*	(8.74)*	(4.71)*	(4.64)*
REX	0.084	0.079	0.027	0.026
	(2.90)*	(2.56)**	(1.06)	(1.04)
PCNI84	−0.026	−0.027	−0.047	−0.047
	(2.01)**	(2.06)**	(1.21)	(1.20)
FDI		0.180		0.303
		(0.54)		(0.84)
Time Trend	−0.020	−0.020	−0.010	−0.010
	(6.60)*	(6.58)*	(3.94)*	(3.92)*
N	66	66	102	102
R^2	0.57	0.57	0.32	0.32

Notes: a: Tibet is excluded. Numbers in parentheses below the coefficient estimates are t-statistics. See Table 3 for the definitions of variables.

*: significant at 1 percent.

**: significant at 5 percent level.

V. Conclusion

In this paper, we asked: did the open door policy help only the richer coastal regions? The results show that the relationship between exports growth and income growth is positive and significant in the rich coastal regions. The rapid rate of exports growth has not affected growth in the poor interior region. Because of the regional differences in the degree of economic development and the concentration of exports in the rich coastal region, the differences between the regions appear to be inevitable.

We found that export was only a very small fraction (about 5 percent) of national income in the interior, while it was more than 17 percent in the coastal region during the 1984-90. When one ranks the province in order of share of exports in national income for the period 1984-90, one finds that all the 11 coastal provinces are included in 11 provinces with the highest share of exports in national income. Moreover, only one province (Guangxi) of the 14 provies with the highest share of exports in national income was not found in the richest 14 provinces. Thus, the findings of our study suggest that export and income growth rates are most highly correlated for the relatively rich coastal provinces with high export shares in national income.

However, it should be noted that the interior region grew more rapidly than in the coastal region and exports expanded also more rapidly in the interior region than in the coastal region. And most of the far inland provinces which enjoyed the fastest rate of export growth were found also at the top of the list of rapid economic growth economies. Thus to some extent the interior region's rapid economic growth should be attributed to the rapid growth in exports.

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