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**How Much Can Regional Integration  
Do to Unify China's Markets?**

by

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***How Much Can Regional Integration Do to Unify China's Markets?***

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## ***Abstract***

Much of the current literature portrays China as a group of insufficiently specialized regional economies, meaning that national economic integration is low. This paper challenges this portrayal by examining data that show inter-provincial trade in 1992 was in fact large. Comparative analysis also suggests that China behaves much more like a single country than a close-knit international trading bloc. Moreover, comparisons with 1987 demonstrate that the growth of inter-provincial trade in 1987-92 exceeded that of provincial GDP and foreign trade during the same period. The results indicate, however, that trade is dominated by intra-industry trade in manufactured goods. Data deficiencies prevent firm conclusions, but the impression persists that significant barriers still exist to the movement of factors of production, and to trade in services and intermediate goods.

## ***Review of the Literature***

How integrated is China's national market today? How much can regional integration do in the future to expand China's market? These basic economic questions take on particular importance in the Chinese context. China's enormous size means that its integration into the world economy cannot be as smooth as that of earlier, smaller export-oriented developing economies. In recent years, the repeated failure to resolve issues related to China's WTO accession at the bargaining table throws into question the ability of the existing world economic order to smoothly accommodate China's emergence. It is therefore conceivable that in its future economic development China might have to rely more on the expansion of its internal market than has been the case in the recent past. In addition, China's geographic expanse and rugged topography means there are significant physical barriers to inter-regional trade. Under such conditions, one would normally expect that economic development should involve a steady integration of heretofore relatively independent economies, and increasing exploitation of regional specialization and gains from trade. However, numerous analysts have argued that China's economy today is under-specialized, and that inter-regional trade is below optimum levels. Some have even argued that China's provinces are becoming *less* integrated, and are devolving into separate protected regional economies. These arguments imply substantial gains from eliminating inter-regional barriers and improving gains from trade.

In this paper, I first examine current conditions of inter-provincial trade. I exploit a new data set to show that inter-provincial trade in 1992 was in fact large. Such comparative data as are available should convince us that China has the basic characteristics of a single country, rather than of an inter-national trading union. Moreover, comparisons with 1987 data show that inter-provincial trade was growing more rapidly than either provincial GDP or foreign trade between 1987 and 1992, so that national economic integration was increasing. Finally, examination of the commodity composition of inter-provincial trade reveals that trade is dominated by intra-industry trade in manufactures (final goods), rather than intermediate inputs. Two-way trade of similar goods (within broad categories) is consistent with competition among producers in different regions.

Having discarded the view that China's provinces are relatively autarchic units linked by weak trade flows, I proceed to discuss current conditions with regard to inter-provincial trade and integration and project future trends. I exploit the difference, familiar in the economic geography literature, between intermediate and final goods. Based on this distinction, I argue that we can profitably think of China's challenge as consisting of two types of integration. The first consists of building adequate infrastructure to permit adequate transport of bulky, energy-intensive commodities and fuels at reasonable cost. The second consists of creating a unified competitive marketplace in which enterprises can exploit productivity differentials and comparative advantage, so that the economy as a whole can reap gains from trade. Progress has been made in both areas, but much more needs to be done. Current changes in the economy, however, have enormous implications for both types of integration. As these recent changes are very imperfectly understood, we need to monitor current developments closely. The paper closes with some suggestions for future research, and opens with some discussion of the existing literature.

### ***Review of the Literature***

There exists a vast literature on the Chinese spatial economy. The bulk of this literature examines regional disparities, especially the coast-inland gap. However, there is also a significant strand of the literature that argues that China's regional economies are insufficiently specialized, that national economic integration is low, and that potential gains from increased specialization and a deeper division of labor may be large. Moreover, there are indications that provincial economies are becoming more similar. Together, these observations have led some authors to conclude not only that potential gains to further integration are large, but also that movement may be in the opposite direction, such that losses from lack of specialization may be increasing. This paper takes a skeptical view of such claims. There are problems with data, and even more serious problems with the interpretation of what data are available.

There are three main strands in this literature. The first strand is descriptive, providing evidence of policy and management decisions made at the local level that interfere with inter-provincial trade. During the mid-1980s, various examples such as the

“wool war” and the “silk war” were cited, in which local governments tried to retain low priced raw materials within their own locality in order to favor local manufacturers (Watson, Findlay et al. 1989; Wedeman 1995). Parallel with these struggles over low-priced raw materials were efforts to prevent inflows of manufacturing goods with high mark-ups. More broadly, a literature developed in both Chinese and English on the extensive power of local governments, and their attempts to maintain protective barriers around local industries (Shen and Dai 1990). There are also stories of semi-official tolls and police and customs checks. However, these descriptive accounts rely on anecdotes, and many were tied to specific circumstances, including price controls that have generally been abandoned in the 1990s. The second strand uses fragmentary data on inter-provincial transfers. Kumar (1994) pointed to the declining ratio of inter-provincial transfers by state-owned commercial organs to provincial GDP, and argued that this indicated that inter-provincial trade was declining in relative terms. This argument suffered from the problem, which Kumar acknowledged, that state-owned commerce was itself a declining proportion of total trade since the economy was “growing out of the plan” as non-state merchants took an increasing share of economic activity. No statistics have been available for those forms of inter-provincial trade that were increasing, and so conclusions on trends for overall trade remained nearly impossible to reach with any confidence. The need for better data was simply made more evident.

The third strand of the literature has been most influential. This is the argument that provincial economic structures are similar and becoming more similar. This argument has been made in many different forms, and is relatively robust through the early 1990s. Economic structure tends to become more similar whether one is examining structure of GDP, structure of manufacturing output, or per capita output of main products. [Li Boxi, 1995; Young, 1996, 1999; Development Research Center, 1997] However, these trends are stronger in the 1980s than in the 1990s. Development Research Center (1997, pp. 12-13) finds that in a comparison of provincial manufacturing output structure between 1994 and 1987, only six provinces show a trend toward convergence, and 23 show a trend toward divergence. They argue that 1992 appears to be a turning point.

The main problem with arguments based on structure of production, however, is the lack of a theoretical yardstick with which to evaluate changes. Structural change in all Chinese provinces has been driven primarily by ongoing rapid industrialization. All Chinese provinces have experienced significant increases in industry's share of GDP, except for the three independent municipalities Beijing, Tianjin and Shanghai. These municipalities of course had (by far) the highest share of industry in GDP on the eve of reform. As development has proceeded, all three municipalities have moved into the phase of tertiary sector development, and experienced reductions in industry's share of GDP. This contributes to a kind of measured "convergence," but hardly one that should be considered ominous. Moreover, all economies experience certain kinds of regional structural convergence at different levels of economic development. Most economists accept that the US is an integrated national economy, and progressed from being a set of regional economies to an integrated economy between the 19<sup>th</sup> and 20<sup>th</sup> centuries. But Kim (1995) shows that the manufacturing structure of states or regions converged slightly between 1860 and 1878, then diverged dramatically through 1914, and remained relatively divergent until the 1930s, before beginning a prolonged and sustained process of renewed convergence. As of 1987, state manufacturing sectors are more similar than they have ever been in the past. Which of these phases would it be most appropriate for China to emulate?

Additionally, changes in production structure in China during the reform era sometimes reflect movement away from inappropriate patterns of regional specialization imposed under the planned economy. Central planners built electronics, machinery and armament factories in interior China, while fostering textile industry development in Shanghai and other advanced coastal regions. Since reform, many inland "high tech" industries have collapsed, while all three municipalities have moved dramatically out of textiles. Such changes may also contribute to measured convergence, as dissimilar regions abandon inappropriate or outmoded patterns of regional specialization. Reversal of inefficient patterns of specialization may be efficiency enhancing, but look like convergence.

In spite of these complexities, some analysts have drawn extreme conclusions from data on production structure. Young (1996 and 1999) argues that China has

devolved into "a fragmented internal market with fiefdoms controlled by local officials." Young argues additionally that improved transport capacity, combined with declining transport intensity of GDP, supports his view that local market protectionism is behind the trends toward structural similarity. (Young also examines some price data, and agricultural yields). Others use the same data on declining transport intensity to argue that gains from trade are being foregone (Kumar). In fact, it is extremely difficult to make robust conclusions about inter-regional trade, cooperation and competition from structural data alone.

### ***Inter-provincial Trade***

The simplest and most logical first step in studying regional integration in China would be to directly examine data on inter-provincial flows. In fact, there are some previously unexploited data of this sort available that enable us to measure commodity flows among China's provinces for occasional benchmark years. Before I present these data, I should acknowledge that regional integration includes more than trade of commodities, and a full consideration should include integration of markets for services as well as an assessment of factor market development and the degree of mobility of capital and labor. It is impossible to do this in the compass of this short paper and, I would argue, probably impossible to do so at all given the current state of our understanding of the Chinese economy. It is undoubtedly true that the service sector—particularly that of relatively more sophisticated business services of the kind most likely to be provided across regions—is underdeveloped in China in respect of both the quality of services available and the degree of interregional service provision. Partly as a result, interprovincial capital mobility is probably relatively modest. As is more widely appreciated, labor has only recently begun to move across provincial boundaries in search of higher income, and nobody argues that a single integrated national market for labor is yet in sight. Other types of integration are therefore likely to lag behind commodity market integration. Moreover, these other types of integration present special challenges to the collection of data. Even in the most sophisticated economies, measuring cross-regional provision of services is difficult.<sup>1</sup> Therefore, it is appropriate to limit the scope

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<sup>1</sup> The I-O tables do provide some data on services, including extra-provincial supply of services, but the data are fragmentary and difficult to interpret, and have not been used in this analysis.



of this paper to commodity market integration. Even in the discussion of commodity markets, some of the following discussion will be devoted to establishing what ought to be the most basic facts. In service markets and capital market integration, existing data do not even allow us to outline these basic facts with any confidence.

The new data exploited in this chapter are the provincial input-output (I-O) tables compiled by most of China's provinces. Provincial I-O tables have been put together on a five-year interval, shortened recently to three-years, so that provincial I-O tables should exist for 1982, 1987, 1992 and 1995. The provincial tables are not published, and are considered sensitive for commercial and national security reasons. However, my Chinese collaborators and I have obtained access to the final-demand columns of 27 provincial I-O tables for 1992. Two of these provinces list only net outflows, and are thus not useful for studying inter-provincial trade. Ten provinces separate inflows and outflows into domestic and foreign sectors. I have combined these data with provincial import and export data from the General Administration of Customs, for all provinces, which also provides a check on the foreign trade data from the ten provinces providing this separately. Together, these data provide meaningful domestic and foreign trade data for 25 provincial level units for 1992. In addition, Zhou Zhenhua (1996) performs a similar exercise using data from the 1987 provincial input-output tables. This provides some basis for examining trends between 1987 and 1992.

Details of data sources and manipulation are provided in an appendix, but a few notes on the compilation of these tables are in order. Compilation of the provincial input-output tables involves an enormous amount of data collection and data handling. Existing data from State Statistical Bureau or ministerial sources provide only about 70% of the data required to build up the tables; the remainder are collected directly by provincial statistical personnel. Compilers break industrial sectors down into main products, visit factories, and interview sales personnel. Often, production and sales by township and village enterprises have to be separately estimated and added to the data routinely collected for state-sector and urban enterprises. On the basis of these newly collected data, input-output table compilers estimate flows of inputs and outputs by main product, collecting data on over one hundred products for the larger industrial sectors. Inputs are easier to collect, since factories maintain relatively complete records on inputs,

but outputs also must be allocated to intermediate and final uses, and to within province and outside province destinations. The product-by-product estimates are then re-aggregated into sectoral data in value terms, providing estimates of the value of products (Zhang Sai and Li Qiang (1985): 79-98, esp. pp. 95-97 on inter-provincial flows; Zhang Shouyi (1992). For updated information, unfortunately not including a discussion of interprovincial flows, see National Accounts Division (1997b).) The data collection phase takes over a year; and an additional nine months are required to compile them into the first draft of a provincial table.

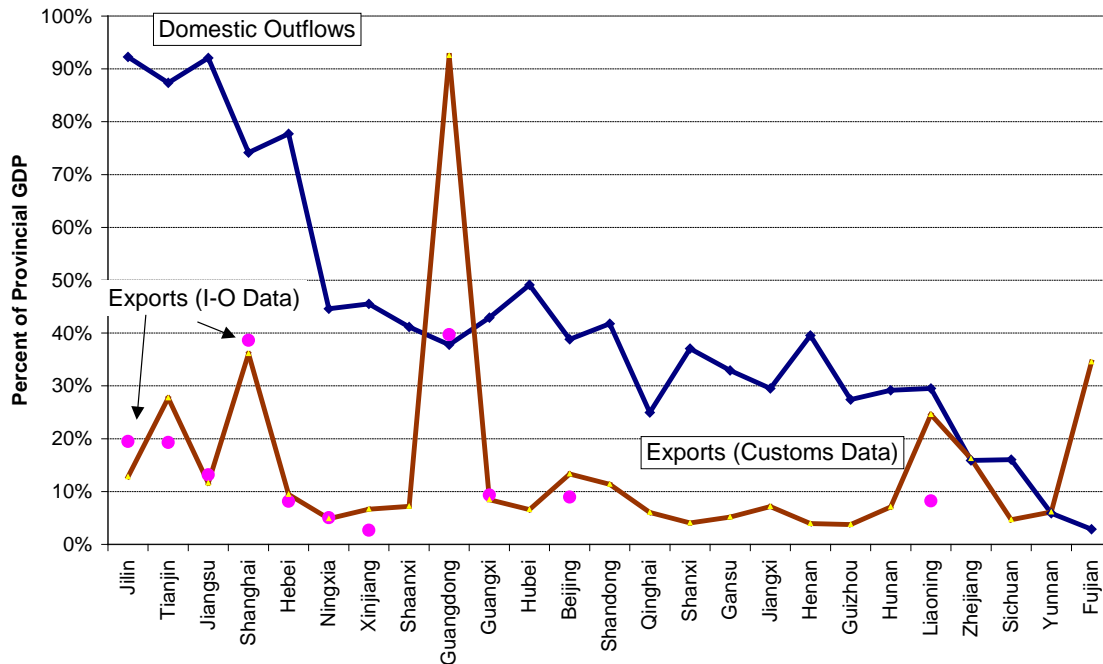
**Table 1: Domestic and Foreign Trade Ratios, 1992**  
(Percent of Provincial GDP, 25 provinces)

<b>Total Outflows/GDP</b>	<b>70%</b>	
Domestic Outflows/GDP	49%	
Exports/GDP	20%	
		(Adjusted)
<b>Total Inflows/GDP</b>	<b>68%</b>	
Domestic Inflows/GDP	53%	(48%)
Imports/GDP	15%	(21%)

Table 1 summarizes the basic data. Inter-provincial trade is large, both relative to GDP and relative to foreign trade. The picture of Chinese provinces as relatively autarchic units, separated from each other, though perhaps open to foreign trade, is clearly false. The column of adjusted figures for inflows in Table 1 reflects the fact that the provincial foreign trade data from Customs do not capture all flows: while 95% of exports are covered, only 74% of imports are captured. The omitted imports appear to consist of commodities imported by central government foreign trade corporations and distributed through national networks. If provincial statisticians recorded all those imports as domestic inflows, then it would be appropriate to adjust inflows as shown, which would make them essentially identical to outflows. Domestic trade is about two and a half times as important as foreign trade.

It is also possible to examine the same data from the standpoint of individual provinces, which is done in Figures 1 and 2. In both Figures, provinces are ranked from left to right by share of domestic inflows in GDP. By this standard, Jilin is the province

Figure 1: Outflows and Exports, 25 Provinces 1992



most open to domestic trade, followed by Tianjin, Jiangsu, Shanghai and Hebei. Yunnan and Fujian are the two provinces least open to domestic trade, although the result for Fujian is sensitive to the procedure used to combine the two data sources (see below).<sup>2</sup> There are two provinces for which foreign trade is more important than domestic inter-provincial trade. It will come as no surprise that these two are Guangdong and Fujian, designated twenty years ago to be the pioneers of China’s opening, and long recognized as the core of a “China Circle” region extending across international boundaries and including Hong Kong and Taiwan (Naughton, 1997). Guangdong has an average level of domestic trade dependence, combined with a very high dependence on foreign trade; Fujian has a low domestic trade dependence, combined with moderate openness to foreign trade. Clearly, Guangdong’s extremely high level of foreign trade dependence is

<sup>2</sup> It may seem surprising that Jilin is so open to inter-provincial trade, but Jilin contains China’s largest truck producer, and in fact inter-provincial flows are dominated by transportation machinery, so this may be the explanation. Fujian is very open to foreign trade, but is geographically quite separated from the remainder of China by rugged mountains and unreliable transport connections. This may explain the surprisingly low level of intraprovincial trade recorded.

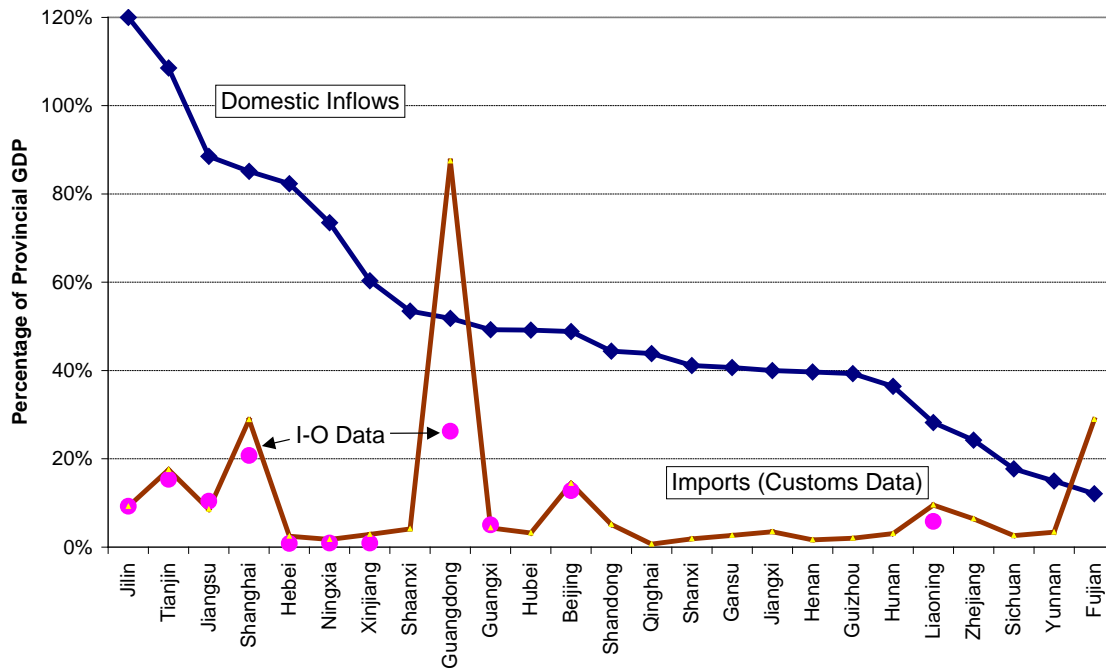
a reflection of Hong Kong's proximity: many transactions within the metropolitan Hong Kong region cross an international border and are considered "foreign trade" for both Guangdong and Hong Kong. Fujian is very open to trade and investment, but lacks a metropolitan area in such close proximity. Figures 1 and 2 show the export and import data from the Customs Administration (lower solid line), as well as the data providing in the I-O tables for ten provinces. The figures are close, except in the case of Guangdong. Guangdong statisticians have long handled "export processing" trade by recording only the "processing fees" earned, rather than the full value of imported inputs and processed exports. The Customs Administration follows opposite procedures, which explains the discrepancy.<sup>3</sup>

If Guangdong and Fujian are subtracted from the totals, due to their distinctively different pattern of integration with foreign trade, the remaining 23 provinces still show a high degree of openness. When the sample is restricted to those 23 provinces, the export ratio declines eight percentage points to 12%, but the domestic outflow ratio *increases* two percentage points to 51%. Total outflows for these provinces equal 63% of GDP, and domestic outflows are more than four times as important as exports. Similar results hold on the import side.

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<sup>3</sup> In the case of the ten provinces which break out foreign trade from domestic outflows and inflows, Figure 1 uses the estimate of domestic trade from the I-O table, combined with estimates of imports and exports from Customs. In the case of provinces that do not separate foreign and domestic trade, the Customs figures are subtracted from total outflows or inflows. In the case of Fujian, this procedure would underestimate domestic trade if processing trade is calculated in the same fashion as it is in Guangdong.

**Figure 2: Inflows and Imports, 25 Provinces, 1992**



Is inter-provincial trade growing rapidly? With existing data it is only possible to make a simple comparison between two benchmark years, 1987 and 1992. Table 2 shows the contrast between some results that can be derived by assessing the data with identical methodologies for 1987 and 1992 for 23 provinces. The summary data for 1992 differ slightly from these given above for three reasons: (a) the sample of provinces is different, lacking two observations; (b) foreign trade is not separated out, because of inadequate coverage of provincial trade flows by the Customs data in the earlier year; and (c) inflows and outflows include small amounts of services, primarily transport and commerce. These changes were made to track the available 1987 summary data as closely as possible. Judging from the figures resulting from this methodology, provincial trade was increasing rapidly between 1987 and 1992. Total outflows (to other provinces and abroad) increased from 52% to 69% of provincial GDP, and total inflows increased from 53% to 68%. These are dramatic increases. Could it be that the increase was driven primarily by increases in foreign trade? Unfortunately, province-level trade data are inadequate to replicate the calculations made for 1992; but Table 2 shows the aggregate growth of total Chinese trade. Those numbers show that foreign trade has been growing

at about the same rate as gross outflows, and could not account for a disproportionate share of the increase. Indeed, if we value imports and exports at swap market exchange rates (which is preferable, as a more accurate evaluation of import procurement costs and export sales prices) the growth of foreign trade is slower than that of total inter-provincial flows.

**Table 2: Inter-provincial Trade, 1987 and 1992  
(23 Provinces)**

	<b>1987</b>	<b>1992</b>
Gross Outflows/GDP	52%	69%
Gross Inflows/GDP	53%	68%
1992 Values (1987 = 100%)		
Nominal Provincial GDP (23 Provinces)		229%
Nominal Gross Outflows (23 Provinces)		305%
Nominal Gross Inflows (23 Provinces)		296%
National Export Growth		
e = Swap Rate		250%
e = Official Posted Rate		319%
National Import Growth		
e = Swap Rate		216%
e = Official Posted Rate		276%

Figures 3 and 4 compare total outflows and inflows between 1987 and 1992 for the 23 provinces with comparable data. In absolute volume, inflows and outflows in all provinces increased rapidly, with a minority of provinces recording a decline in the proportion of GDP accounted for by outflows or inflows: four recorded decreased proportional outflows and six decreased proportional inflows. The stragglers seem plausible and may reflect real problems: only Tianjin and Liaoning experienced reductions in share of both outflows and inflows. Both these provinces are old industrial bases struggling with serious economic problems and an unfavorable northern location. Two provinces experience large changes that are difficult to interpret: Yunnan

Figure 3: Total Provincial Outflows: 1992, 1987

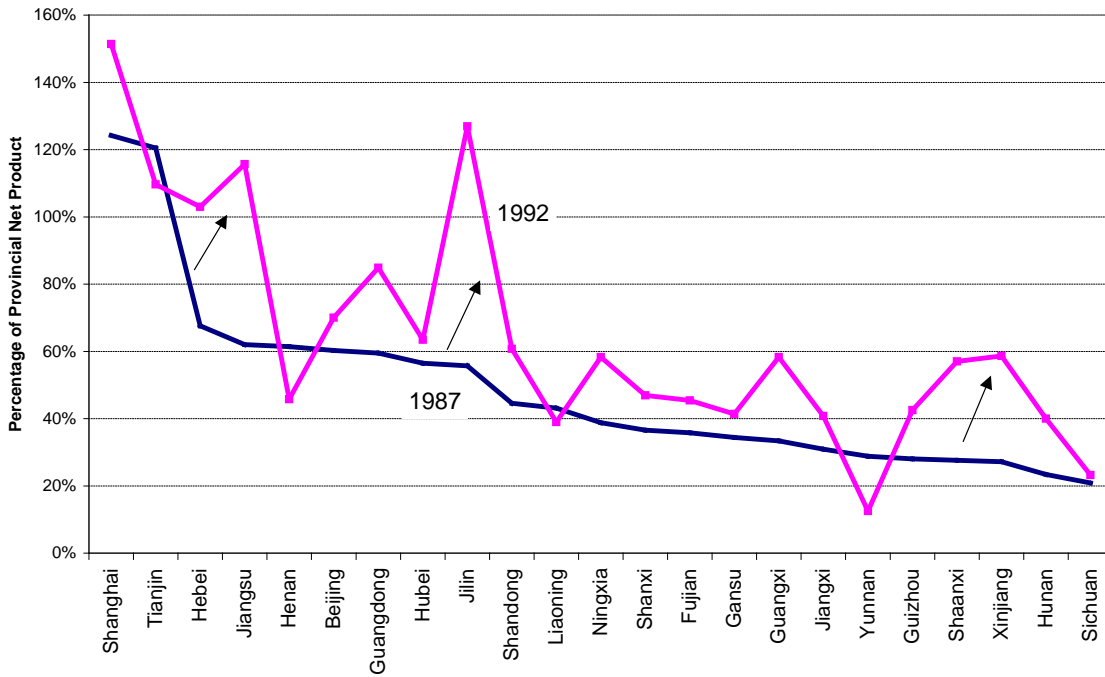
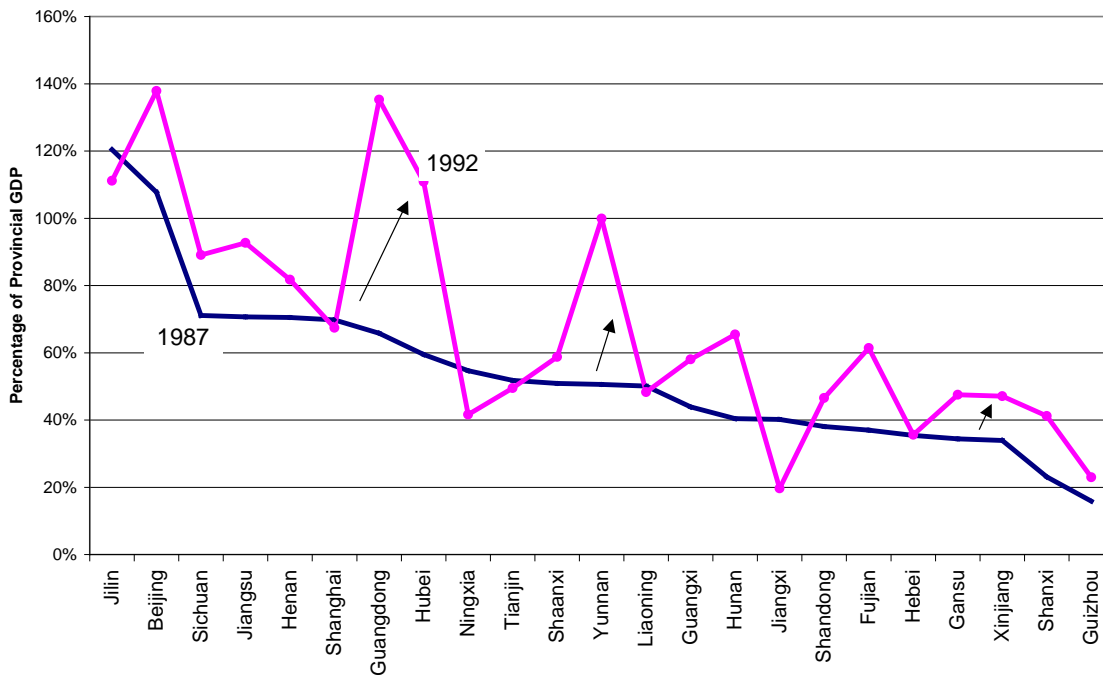


Figure 4: Total Provincial Inflows: 1987, 1992



experienced a large increase in inflows and a large decline in outflows; while Jilin experienced a large increase in outflows and a small decline in inflows. For both these

provinces, transfers are dominated by a single industry (cigarettes in Yunnan; automobiles in Jilin), which may account for some of the volatility. Jiangxi suffered a large drop in inflows that is unexplained; and Shanghai experienced a slight drop in inflows. Overall, the exceptions seem to “prove the rule:” regional integration is moderate to high, and increasing for the period we can measure.

The numbers for inter-provincial trade cited here certainly seem substantial. Can we say anything more definite about these numbers, perhaps in a comparative perspective? Data on inter-regional trade within nations in general are rather scarce: the US does not collect data on inter-state trade, for instance. However, there is a recent strand of trade literature that finds that national borders still have a big impact on trade flows. For example, Canada is one of the few countries that collect data on inter-provincial sales. McCallum (1995) reports that 44% of goods shipped stay within the original province; 23% go to other provinces in Canada; 24% to the US; and 9% to the rest of the world (1988). Most strikingly, McCallum finds that Canadian producers are twenty times as likely to ship a product to a Canadian customer as to a US customer, even after distance and market size are accounted for. (Engel, 1996, confirms these results.) The results reflect the fact that Canada is actually closer to the US than it is to itself. Surprisingly, Wolf (1997) studying the US, finds that in addition to a “home country” effect, there is also a “home state” effect, making businesses about four times as likely to ship a product within state, even after distance and market size are accounted for.<sup>4</sup> Chinese provinces are much bigger than US states by population, and are separated by more significant geographic barriers. Certainly, we should expect Chinese inter-provincial flows to be substantially larger than would be flows between national entities in Chinese geographic space.

Clearly these are no simple comparisons, because there is no geographic entity similar to China. We can compare the Chinese data, however, with data on inter-national trade among countries within a larger entity that has some geographic unity. For example, intra-European Union exports amounted to 12.4% of GDP in 1980, inching

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<sup>4</sup> Wolf uses a data set based on rail, truck, air and water shipments. The Chinese data are not based on shipments but rather on estimates of sources, uses, and destinations (although statisticians occasionally consult transportation data as a secondary reference). No direct, simple comparison is possible, only an observation on roughly comparable orders of magnitude.



upwards to 13.6% in 1990. Another potential comparison is with ASEAN: Singapore, Malaysia, Thailand, Indonesia, and the Philippines exports to each other and other ASEAN members amounted to 13% of their GDP in 1997. Chinese inter-provincial trade is about four times larger, in relation to GDP, than is inter-national trade within either of these multinational regions.<sup>5</sup>

Such comparisons do not prove that China is a tightly integrated economic space, but they do indicate that China looks somewhat more like a national economy with regions that trade with each other, rather than a collection of national economies engaging in foreign trade. National borders still matter. Intra-EU trade is held back by language barriers, currency risk, and regulatory barriers, factors that are less present in China. Conversely, transportation infrastructure is far better in the EU. Finally, the share of services in EU GDP surpasses 60% (versus only 34% in China in 1992), and trade in services is excluded from our measures. Excluding the tertiary sector from GDP in both the EU and China permits a further comparison. Intra-EU trade is about 34% of value-added in goods-producing sectors; inter-provincial transfers in China in 1992 are 75% of value-added in goods-producing sectors. Certainly, China's provinces do not stand out as clearly autarchic economic units.

In addition, inter-provincial trade seems to be significant for virtually all provinces, regardless of income level or geographic location. There is certainly enormous variation in the degree to which individual provinces are involved in *foreign* as well as domestic trade. As has been widely recognized, coastal provinces, and Guangdong in particular, are (at least) an order of magnitude more open to foreign trade than inland provinces. Given this differential, it would be alarming if we found that inter-provincial trade was small as a share of output for inland provinces, since they would have no alternative means to exploit local comparative advantages. But the data clearly show that this is not the case. Indeed, the average of the 14 inland provinces for which we have good data is that domestic inflows were 43% of GDP and outflows were

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<sup>5</sup> The two multinational regions are very different with respect to the amount of trade they carry on outside their region. Intra-EU trade is more than half of total trade by EU member nations. By contrast, the ASEAN-5 countries export 40% of GDP to outside ASEAN. Indeed, the ASEAN countries are open to foreign trade but trade little with each other: but a similar generalization can clearly not be applied to China.

55%, only slightly lower than the average of the 11 coastal provinces, at 58% for inflows and 63% for outflows.

More striking is the large net flows, particularly for inland provinces. Part of this is explained by the fact that some imports are treated as domestic inflows (and, conversely, virtually all provinces have apparent export surpluses on the foreign trade account). When domestic and foreign trade are combined, the average inland province has a 10% of GDP surplus of inflows over outflows, while the average coastal province has a 1.5% of GDP surplus of outflows. Most of the inland inflow surplus can be attributed to four provinces with huge net inflows: Xinjiang 40%; Ningxia 34%; Qinghai 19%; and Jilin 15% of GDP respectively. These inflow surpluses correspond to transfer payments from the central government, predominantly through the government budget. This should be a caution, since these beneficiaries of government largesse may simply be “welfare dependent,” rather than specimens of healthy integration. When those beneficiaries are excluded, the other 10 inland provinces have an average net inflow of just under 3% of GDP.

### ***Commodity Composition***

Having established that China’s provinces are not autarchic economies, but are rather deeply involved in inter-provincial trade, we now seek to push the analysis further in a number of different directions. First, let us consider differences between types of commodities. Oversimplifying, we can consider a distinction between intermediate goods--usually bulk commodities--and final manufactured goods with individualized characteristics. Generally speaking, we expect to find two regularities. First, bulk commodities should be engaged primarily in one-way flows. Since the commodities have identical characteristics, we would not expect to see two-way flows of a given commodity (assuming we have divided the commodity classification finely enough). Inter-industry trade would dominate total trade in these commodities.<sup>6</sup> By contrast, final goods have individualized characteristics, and there should be significant two-way flows as consumers seek goods with the attributes they want. Two-way flows of commodities

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<sup>6</sup> This would especially be true early in the industrialization process. Later on, more differentiated intermediate goods would develop, in a process that has been hypothesized to be one of the forces that gives impetus to continuing economic development.

within a single industrial sector—or intra-industry trade (IIT)—will be most common when commodities incorporate a bundle of characteristics that can vary in many dimensions, and this is more likely to be true of final than intermediate goods. I define IIT, as is conventional, as occurring when a province both imports and exports goods in a given industrial sector. Second, early in the development process, we would expect to see more inter-industry trade, for two reasons. First, suppose that the initial “sprouts” of industrialization occur in localized areas where there are specific mineral resources or locational advantages that encourage the earliest, most difficult, phases of industrialization. We would expect initial industrialization to be quite specialized, and early modern producers (mines or factories) would be large relative to their local communities. Moreover, much initial manufacturing would be simple processing of (especially agricultural) raw materials. Thus, we would expect to see substantial inter-industry trade, and in particular, substantial exchange of manufactures for raw materials. Such trade should dominate total trade. Subsequently, as industries diversify and become more sophisticated, the proportion of intra-industry trade should increase. This is partly because of the simple fact of greater diversity of local economies; partly because more output would involve more sophisticated stages of processing; and partly because higher income consumers would be more concerned about the specific attributes of goods they are purchasing. Indeed, as Baldwin (1999) has recently pointed out, we observe exactly this trend in world trade. During the first wave of globalization (1880-1914), world trade was dominated by the exchange of manufactures for raw materials (especially between industrialized and agrarian economies) and by the exchange of consumer goods for capital goods (between industrialized economies at different levels of development). Subsequently, during the more recent second wave of globalization, total world trade is dominated by intra-industry trade, in which similar economies exchange essentially similar goods with slightly different attributes.

Such a distinction is surely of interest in the current discussion of market integration in China, because the problems—and therefore the data of interest—differ substantially between the two categories of goods. For raw materials, we are concerned that different regional economies have adequate access to energy, minerals, metal products and cement, such that bottlenecks of supply or transportation do not retard

development. These goods are bulky and heavy. Energy (for the production and transport of these goods) and transport are the key issues. National integration is a meaningful concept, but the realization of the concept is to have sufficient capacity in transportation and energy production, and adequate efficiency in the production of energy and transport services, to ensure the predominantly one-way flows of these goods to the manufacturing centers that concentrate demand. Let us call this “Integration A”. It is not at all the case that for flows of bulk commodities more is better; quite the contrary, if production of goods and services can increase while using less of these material inputs, that is all to the good. This is particularly relevant in examining transition economies, because we know that the socialist economies operated with strikingly high material intensities. Toward the end of its days, the Soviet Union produced more steel, oil, and chemical fertilizer than any other economy, but it converted these inputs into final goods with breath-taking inefficiency. If, for example, China manages to grow while shipping less coal among regions, this should not be taken as a reduction in specialization, but rather as an improvement in economic performance.

By contrast, trade in manufactured goods correlates well with national integration in the sense of a unified, competitive market, in which consumers can choose among competing goods from different regions, of essentially similar type but with different attributes. Intra-industry trade in manufactures should be a good index of this type of national economic integration, which we can call “Integration B” or competitive market integration. Once again, this issue might be particularly sensitive in transition economies. We know that manufacturing centers such as Shanghai paid high tax rates, corresponding to net uncompensated transfers on the provincial “capital account.” Correspondingly, there must have been a large apparent “trade surplus” on the current account, consisting of manufactured goods. If these large one-way flows are reduced, due to declining taxes, growth of diversified industries in other regions, or changes in the structure of Shanghai industry—or all of these combined—should we identify this with a reduction in exploitation of regional comparative advantage and a decline in the level of national economic integration? Not necessarily.

Table 3 shows that Chinese inter-provincial trade is dominated by intra-industry trade. The table shows inter-provincial trade broken down into the 23 sectors that are

used in the 1992 (and 1995) I-O tables. The definition of intra-industry trade (Column 2) is standard, taking two-way flows within a given sectors as a percentage of total flows of commodities in that sector. The sectors are highly aggregated—slightly more aggregated than a standard “two digit” classification—and thus overstate the degree of intra-industry trade to some extent. Nevertheless, it is clear that the bulk of provincial outflows consist of products from sectors with differentiated output, high rates of intra-industry trade, and a relatively high share of final uses (consumption and fixed investment) in total domestic uses (Column 3). Here, share of final use is the national average, taken from the 1995 national I-O table (National Accounts Division 1997a).<sup>7</sup> Because of the high degree of aggregation, we can’t really tell that provinces are exchanging goods with similar attributes, only that provinces are exchanging goods within broadly similar categories. But the data are strong enough to show that inter-provincial flows are certainly not dominated by one-way transfers of raw materials, such as we might expect to see under a central planning regime, or perhaps at an early stage of economic development. At least China’s inter-provincial flows are not inconsistent with a hypothesis of an integrated national market with competition among producers located in different provinces. Moreover, when we examine trends in inter-provincial trade *by value*, we are primarily examining trends with respect to manufactured goods.

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<sup>7</sup> The commodity data include domestic outflows from the ten provinces which separate domestic and foreign outflows, plus total outflows from the fifteen provinces that do not separate outflows. Provinces separating domestic and foreign flows include Guangdong, Shanghai and Liaoning, the three largest exporters in 1992, accounting for half of total exports. Therefore, remaining included exports are a very small proportion of total outflows. Share of final uses is from the 1995 Input-Output Tables.

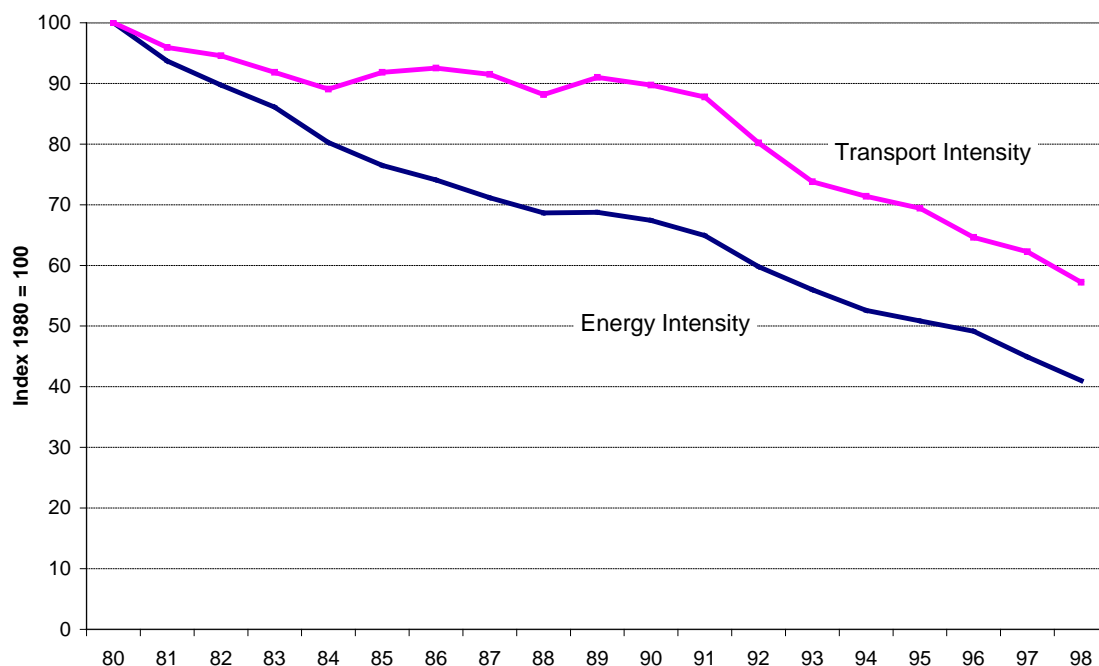
**Table 3: Characteristics of Goods in Interprovincial Trade**

	Share of Total Domestic Outflows	Intra-Industry Trade Share of Total Trade	Percent Final Use
Chemicals, Rubber, Plastic	12.7%	70.3%	8.5%
Machinery	9.8%	63.4%	43.9%
Food Products	9.4%	67.5%	63.1%
Agriculture	8.9%	56.2%	42.5%
Textiles	8.7%	62.8%	7.2%
Transport Machinery	8.4%	56.2%	36.3%
Metallurgy	8.3%	55.4%	0.8%
Building Materials	5.0%	49.0%	10.9%
Electric Machinery	4.7%	39.8%	23.5%
Electronics	3.6%	50.4%	41.8%
Metal Products	3.2%	50.1%	12.7%
Coal Mining	3.2%	33.5%	11.6%
Garments	3.0%	50.4%	66.2%
Paper, Toys, Handicrafts	2.9%	59.2%	16.9%
Petroleum Refining	1.6%	36.7%	3.7%
Petroleum	1.5%	35.2%	0.0%
Other Industry	1.4%	44.0%	5.4%
Mineral Mining	0.9%	37.0%	9.8%
Ferrous Mining	0.8%	36.7%	0.0%
Instruments	0.8%	61.8%	18.0%
Coking & Coal Gas	0.5%	35.9%	35.2%
Lumber & Furniture	0.4%	32.0%	28.3%
Electricity	0.3%	15.4%	16.6%

***Bulk Goods and Materials***

When we examine trends in inter-provincial trade by volume or weight, we are primarily examining trends with respect to intermediate goods. If we do not adequately differentiate between intermediates and final products, we are in danger of misunderstanding other data about the Chinese economy. Figure 5 shows that, according to official Chinese data, the energy intensity and transport intensity of the Chinese economy have both declined dramatically since 1980. To be sure, the figure overstates the magnitude of decline because it uses official Chinese data that overstate the growth of real GDP. But it is important to recognize that the underlying phenomena appear in the

**Figure 5: Energy and Transport Intensity of GDP**



data even with fairly radical revisions of GDP growth. If real GDP growth is reduced by two percentage points every year from 1980 through 1998—which is near the upper range of the consensus critique of Chinese GDP figures—energy intensity still declines significantly. Taking a unit of energy consumed per unit of real GDP produced in 1980 as 100, energy usage declines to 57 in 1998 under adjusted GDP growth (instead of 41 if official data are used), and transport intensity declines to 80 (instead of 57). Under any reasonable set of assumptions, the Chinese economy has dramatically reduced the amount of energy required for a given output value.

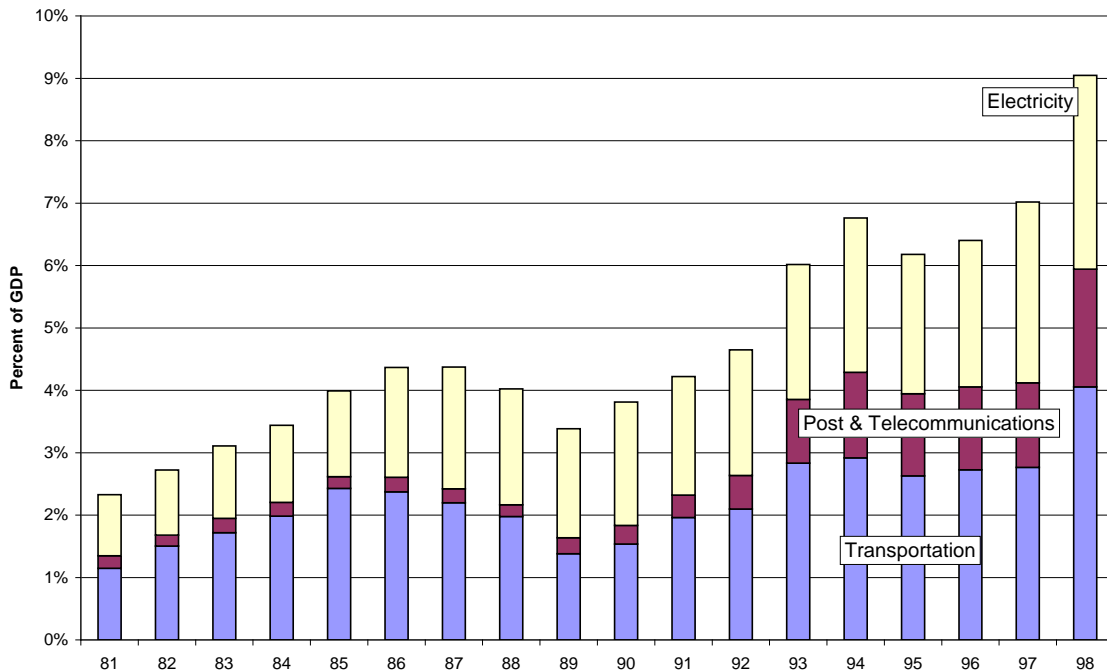
In fact, it would be astonishing if this were not true. In the early 1980s, there were virtually no commodities in the Chinese civilian economy that had high value per weight. The economy displayed the pathologies both of a centrally planned economy, and an underdeveloped economy. There has been vast change in the economy since then. Reduction in the share of bulk, low-value commodities in the economy improves the energy and transport efficiency of the economy. Consider these points from (Rong, Li et al. 1997):

“The inadequacy of the national transport system remains the major barrier to greater regional integration....Coal alone accounts for two-fifths of the

overall railway ton/km freight task....Apart from coal, the other main freight flows are of grain and iron and steel (each 8 per cent of the railway ton/km task)...The main transport problem....is the serious shortage of railway capacity, largely because of the priority given to coal, building materials, and other bulk freight. Space for non-priority freight has to be booked weeks in advance and there is no certainty as to when consignments will reach their destination.”

Although coal, grain and iron and steel account for well over half of railroad freight task, they make up at most ten or fifteen percent of the value of inter-provincial trade. At one point, the need to ensure shipments of these bulk commodities obstructed the development of shipments of high value commodities. However, that is unlikely to be the case today, except in individual areas of China. During the 1990s, China has made a major investment effort to upgrade its transportation and communications infrastructure. This has included substantial upgrading of the railroad infrastructure (double-tracking, conversion to electric and diesel engines, etc.) as well as construction of major new inter-provincial express highways and fiber optic backbones for communication. Figure 6 shows the increase in investment effort in infrastructure that became evident in 1993. Since 1993, investment in physical infrastructure has always been above 6% of GDP.

**Figure 6: Infrastructure Investment: Major Trends**





The combination of improving availability of transport and declining transport intensity of GDP almost certainly reflects an underlying shift in the structure of the economy. The overall materials- and energy-intensity of the economy is declining. This is strongly supported by the data on energy consumption. The result is less pressure on transport infrastructure, and more room for inter-regional exchange of higher value commodities. In a broad sense, then, the data on transport infrastructure and transport intensity should reassure us the physical bottlenecks are unlikely to pose the major obstacle to regional integration (contra Rong et al). We have already seen that manufactured final goods make up a large proportion the value of inter-provincial shipments. Neither “Integration A” nor “Integration B” seems to be at crisis levels.

### ***Provincial Policies that Restrain Trade***

Thus far we have focused on data that encourage us to view China essentially as a normal developing economy. Inter-provincial trade is substantial, and increasingly consists of manufactured goods; an intensive investment effort is easing transport bottlenecks and lowering the effective cost of transport and communications. At the same time, there are clearly institutional features of the Chinese economy that retard the growth of regional specialization and interfere with national integration. At the heart of these institutional features is the continuing role of local governments as owners and managers of a significant part of the local economic base. Local government ownership is significant because local officials have complex objectives that extend beyond the normal economic activities of the enterprise: local officials have interests in sustaining employment and maximizing tax revenues and non-tax benefits. In addition, local officials have a number of strategic objectives: positioning themselves to obtain rents and central government subsidies, and preserving firms that may serve as suppliers or customers to other strategic firms. Because local officials also have significant regulatory powers over both production and trade, it is not surprising to find that on occasion they use their diverse portfolio of powers to protect local firms and obstruct competition from firms outside their locality.

Institute of Industrial Economics (1998) describes the situation a year or two ago:

In recent years, as reform and opening has developed in greater depth, regional protectionism has been reduced, but not eliminated. For example, some local governments have used administrative, economic or legal measures to protect their local beer or chemical fertilizer industries, creating obstacles for competing products from outside. Some localities turn a blind eye to substandard or defective products sold by their firms, while at the same time intentionally creating problems with commercial registration, health inspections, or technical certification for top quality products from outside. Some local governments encourage discriminatory treatment in access to bank credit between local or outside firms, and some even go so far as to forbid bank loans to outside firms. In commercial disputes, some local courts blatantly favor local firms (p. 294).

This description rings true. Local governments don't blockade their borders or impose tariffs. But their pervasive influence over the local regulatory apparatus enables them to impose significant non-tariff barriers to outside firms that can significantly increase the costs of trade and cross-border investment.

This description suggests that the key problems with respect to inter-regional trade are the same as the key problems with respect to further economic reform more broadly defined. To understand current and future trends with respect to inter-regional trade we need to examine the benefits and costs to local governments of protecting local economies. Until recently, local governments have had very strong incentives to intervene in local economies, and substantial means to do so. Through the early 1990s, these incentives were shaped by the disproportions between “basic” raw materials sectors (intermediate goods in our terminology) and “processing” sectors (manufactured final goods in our terminology). A long term pricing policy that kept the relative price of most raw materials low, and a development strategy that encouraged energy and material-intensive sectors so that bottlenecks remained pervasive. Under these circumstances, government intervention was repeatedly justified: governments *ought* to intervene in intermediate goods industries to ease bottlenecks, and governments *wanted to* intervene in processing industries because it established a claim on scarce, cheap materials and provided a source of revenues. Local protectionism—including the various “wool wars” and other anecdotal incidents—flourished under this environment.

After the mid-1990s, though, this economic environment began to change. Economic reform reduced demand for intermediates, while supply increased. The “industrial policy” of 1990, which had focused overwhelmingly on energy, steel, and

other “basic industries” was set aside as unnecessary. But planners then took a page from the plan book of Japanese industrial policy, and set out to identify a new list of priority “pillar” industries. Pillar industries were expected to have high income elasticities, significant technological (learning by doing) content, and spillover effects in economic development. Local governments were encouraged to carry out their own planning exercises. In this case, the expectations of industrial policy very much corresponded with the economic interests of local officials as they saw them; they were being invited to stake out territory on the ground floor of the most profitable industries of today and tomorrow. Nor surprisingly, they responded enthusiastically.

**Table 4: Provincial Priority Industries in the Ninth Five Year Plan (1996-2000)**

	Autos	Electronics	Petro- Chemicals	Machinery	Metallurgy	Building Materials	Capacity Under Construction (Thousand Units, 1996)	
							Automobiles	Motorcycles
Beijing	2	1		3	5		120	
Tianjin	1	2			4		100	
Hebei	3	5		3	6	7		
Shanxi				2	1	4	11	
Inner Mongolia	4				3			
Liaoning		3	1	4	2		53	
Jilin	1		2	5			274	
Heilongjiang	1	4						
Shanghai	1	2	5	3,4	5		120	
Jiangsu	4	2	3	1			194	1,200
Zhejiang		2		1		7	21	200
Anhui	1	4	2			3	173	10
Fujian			1	2		4	26	120
Jiangxi	2	1	4	3		8	51	50
Shandong	3	2	1				103	700
Henan	1		3	2		4	337	
Hubei	1	2			3	5	293	275
Hunan	2				1	3	3	307
Guangdong	1	4	2			3	3	450
Guangxi	3			4	2	5	97	100
Hainan	2		1			7	50	
Sichuan	6	5		4	1	7	105	5
Guizhou	4				2	7	90	
Yunnan					3		60	
Tibet						5		
Shaanxi		2		1			23	
Gansu			1	3		2	3	
Qinghai			3		4			
Ningxia					1			
Xinjiang			2			6		
<b>Total (Provinces)</b>	<b>19</b>	<b>15</b>	<b>14</b>	<b>15</b>	<b>15</b>	<b>17</b>	<b>2,017</b>	<b>3,837</b>

Source: Lu Dadao 1997, pp. 62, 84.

As Table 4 shows, at least 19 (out of 30) provinces selected automobiles as a priority industry; and other favorite industries were selected by nearly as many provinces.

As the right two columns of the Table also shows, these desires were translated into investment decisions that sharply increased the new capacity under construction.

The result has been something just short of disastrous, with massive over-capacity in a range of “pillar industries.” Today, however, these incentives are weaker, in part because of the results of past policies. The shift toward pervasive oversupply in many markets, accompanied by fierce competition and falling prices, has made many local governments acutely aware of the costs of being stuck with uncompetitive capacity. During 1998, responsibility over industrial policy was transferred from the State Planning Commission to the State Economic and Trade Commission, which has much more regard for market conditions and more interest in the current economic health of existing enterprises. A notable reduction has occurred in the extent to which sectors and firms are designated for priority support by national policy-makers ahead of marketplace signals (Ma Hong 1999: 101-2). These changes mean that the benefits to local governments of engaging in active industrial policy are being reduced.

At the same time, one of the most important forces constraining local governments and tipping them toward market intervention is also being reduced. This is the need to defend employment levels. Since 1996, the imperative to protect local employment levels has been dramatically reduced. Wide-spread layoffs in state-owned firms have followed. Between 1992 and the end of 1998, the state-owned enterprise work force has declined by 21 million people net, almost a third; the urban collective enterprise work force has declined by 16 million net, more than a third. While 10 million of these workers have been absorbed into joint stock and limited liability corporations, some of which are merely public firms with converted administrations, the net reduction in the size of the public enterprise work force has been very substantial. Local governments no longer need prove that they can protect public employment levels; some, indeed, are even under pressure from above to cut workers. This reduces one of the incentives for active market interventions. The benefits to local protectionism have thus been reduced. Nevertheless, as long as local governments own and regulate firms, there will be incentives to restrain trade.

At the same time, it has become more costly for local governments to attempt to countermand market outcomes. Recourse to bank loans and tax exemptions to prop up

local firms has become more difficult. Premier Zhu Rongji has imposed a harder budget constraint on the state banking system, and reorganization of the commercial banking system has broken the tight link between local government officials and local bank branches. Consistent stress from the central government on the need to increase budgetary revenues has made it incrementally more difficult to prop up local firms through tax exemptions or hidden subsidies.

### ***Enterprise-Level Change***

Changes at the enterprise level are also combining to make local government intervention more costly. Notably, enterprise reforms that may be inadequate to fundamentally change the incentive environment of the enterprise itself may have a positive impact on local government incentives. The clearest example is the conversion of state firms to joint stock companies with majority or complete ownership by government agencies. As a model of enterprise reform, such a conversion is likely to have limited impact. But such an organizational change does tend to break the nexus between local government and enterprise. Because equity control can be exercised by extra-local governments, or even by enterprises in other regions, this model facilitates the diversification of the local economic base and its separation from local government stewardship. Indeed, there has been a wave of takeovers of local by outside firms in recent years, seen as a favored way for local governments to shed responsibility for troubled firms with a minimum adverse impact. Successful producers of consumer durables, for example, have used takeover of local firms to expand market reach in many instances.

In a related fashion, recent years have seen a dramatic diversification in the channels through which goods reach their final consumers. For years, state-run commercial enterprises (or material supply firms for producer goods) ran wholesale networks, firmly positioning themselves between producers and consumers. Even as the apparatus of planning was dismantled, state wholesalers were able to exploit their strategic position to control many commodity flows, and extract profits (and rents). They also provided local governments with a convenient channel to exercise influence over trade. Conversely, Chinese distribution channels were widely recognized as one of the

least efficient parts of the entire economic system.<sup>8</sup> These arrangements are now crumbling. By 1996, state material supply enterprises were transacting only 16% of producer goods sales. Production firms were creating their own sales networks, relying on their own subsidiaries or, increasingly, on designated agents. Producers of consumption goods were experiencing a related diversification, with distribution networks, wholesale markets, and increasingly active retailers expanding upstream into distribution. Former profits of state-owned commerce were eroding (Institute of Industrial Economics 1998: 396-407). Clearly, this means that local governments are losing an important instrument for intervening in inter-regional trade.

It seems clear that the systemic characteristics referred to above—local government sponsorship of specific firms, subsidy and protection to less efficient firms, etc., etc.—have recently been substantially reduced in strength. Under the pressure of a macroeconomic turn-down and an unprecedented level of capacity expansion, competition has recently intensified. The combination of increased competition, reduced resources available for implicit and explicit subsidies, and an ideological green light for restructuring, bankruptcy and privatization (at least of small firms) appears to have led to a rapid growth of consolidation and restructuring. However, we know relatively little about the pace of restructuring in the aggregate. A crucial question is the extent to which surplus, inefficient capacity is being shut down.

In two troubled sectors, textiles and coal mining, the government has taken an aggressive role in shutting down excess capacity. During 1998, 5.12 million spindles were decommissioned, and 660,000 textile workers laid off, both numbers “above targets.” Similarly, during 1998-99 extensive efforts are being made to shut down small-scale, often dangerous and polluting, coal mines whose output is no longer needed (Ma Hong 1999: 96). These efforts certainly seem consistent with the rapid reduction in the public enterprise labor force. We know that there is now substantial change in the number of firms in business, indicating substantial birth and death of firms. For example, in 1998, 40,000 non-financial state-owned enterprises went out of business, and 16,000 new ones were set up! The result was a 24,000 net decrease in state firms, to 238,000

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<sup>8</sup> This inefficiency also attracted interest from foreign firms, and made WTO-related market access provisions particularly controversial.

total at year-end. On a more specific note, the number of breweries declined from 740 in 1996 to 500 in 1998, indicating an industry undergoing rapid consolidation.[She 1999, Chen 1999] There are certainly numerous indirect indications that rapid restructuring is ongoing.

It is inconceivable that changes of this magnitude could not have implications for regional specialization. More rapid restructuring, and particularly a willingness to shut down less efficient producers in different regions, could contribute to a greatly accelerated process of national integration. Nonetheless, there is still much we do not know about the current restructuring. We do not know its overall magnitude. For example, what proportion of laid-off workers come from firms that are shut down, and what proportion correspond to firms that are being slimmed down in an attempt to keep them in business? We do not know the extent to which ongoing restructuring is truly market-driven, and to what extent government is driving it, as in the case of the consolidation of the coal industry described above. Ironically, one of the new incarnations of industrial policy is to promulgate a long list of obsolete and polluting technologies which cannot be used and must be decommissioned by the year 2000 (Ma Hong 1999: 102-112). This can be seen either as a government effort to accelerate a market process, or as an attempt to substitute government fiat for market forces. We may hypothesize that a process of restructuring is underway which we expect to lead to rapid increases in national integration. However, the evidence is not yet sufficient to justify whether this hypothetical process is in fact truly under way, or whether it will be sustained through the coming years.

### ***Conclusion***

There is a great deal we don't know about inter-provincial trade and specialization and national integration in China. One strand of future work would ideally focus on measuring and analyzing inter-provincial trade. Although data sets are in short supply, creative exploitation of existing data may provide some interesting avenues of approach. The 1995 input-output tables should be available soon, and they might provide substantial insight into the process of regional change. Data sets based on shipments might be useful, as Wolf showed for US data. In essence, all the interesting questions

that trade economists have been examining with respect to international trade can be re-examined in the Chinese context, with potentially fertile results. An important sub-strand of this work will be to examine inter-regional flows from the standpoint of services. It appears that finance, trade and transport in particular are growing rapidly in their role in the national economy, but we have almost no clear quantitative understanding of these processes.

Second, regional growth models seem a potential important area for future research. Economic geography has been a source of excitement in economics lately, and China should provide a fertile source of empirical data and new hypotheses. The work is difficult, though: Chinese price data in particular need to be carefully handled in order to produce meaningful results. One essential finding of nearly all careful empirical work has been that there are large, enduring productivity differentials favoring coastal provinces in a wide range of production sectors. We need to understand better the sources of such differentials. We also need to understand and anticipate the consequences of such findings, if they are confirmed by future research. Enduring productivity differentials and a more integrated national economy imply that shifts of output and income toward the coastal areas can be continued for another couple of decades. That implies that Chinese economic geography will be dramatically reshaped in coming years, with labor and capital migrating eastward, and creating productive new agglomerations along the Chinese coast.

Third, and finally, topics related to regional integration cannot be separated from an understanding of the ongoing process of enterprise reform, privatization, and marketization in the Chinese economy. Despite the enormous progress that has been made since 1978, these processes have by no means run their course. This means that although serious problems still lie ahead, the potential productivity gains that might be reaped in a relatively short time in the future are still enormous. Probably, it will be possible for China to reap most of these gains with an ongoing reform process, even if that process did not include WTO membership and radical opening to the outside world. But in that case, dramatic domestic initiatives would have to take the place of WTO membership. Otherwise, a failure on the WTO front, plus a slow-down of domestic



initiatives would mean a huge cost in terms of foregone output and failed developmental initiatives.

We know enough about Chinese inter-provincial trade to know that it is an important topic for future research. Overly simple characterizations of Chinese provinces as quasi-autarchic protected economies simply don't fit the facts. Instead, important flows of materials link these different regions. It is worthwhile to understand the content and determinants of these flows. Moreover, it is clear that the system still imposes unnecessary costs and limitations on inter-regional flows. Removing those barriers will provide an additional source of growth and improved productivity to the Chinese economy. A better understanding of the issues would give us a better grasp of the magnitude of the potential benefits to growth from great integration.

## **Data Appendix**

The provincial input-output tables provide a superb source which allows us to approach much closer to the information we actually need on inter-provincial flows. However, the provincial tables appear to vary substantially in quality and reliability. It is clear from visual inspection of the input-output tables that (a) provinces follow somewhat different procedures for collecting information and compiling tables, so inconsistencies may exist when provinces are compiled; (b) quality of collected data varies substantially; and (c) there may be conceptual errors in the way some provinces have collected or recorded data. Clearly, one should be cautious in relying too heavily on these tables for specific points. Yet, if the tables provide strong and unambiguous for any general point, they are far to be preferred to indirect inference from other data sources, which suffer *both* from data presentation inconsistencies and from significant theoretical problems with the inferences used to get to observations about inter-regional integration.

For 1992, I have access to the final demand columns for 27 provincial I-O tables (missing are Tibet and Inner Mongolia. In addition, Hainan and Chongqing, which now have provincial status, are included with Guangdong and Sichuan respectively). Unfortunately, the full tables are considered sensitive information (perhaps for both national security and commercial reasons), and require formal government approval to be released; I have not seen the full provincial tables. Two provinces (Anhui and Heilongjiang) have only net outflows, so they are not usable for studying inter-regional integration. Therefore, useful information exists for 25 provinces. Ten of these tables break the outflow and inflow columns into domestic outflows and exports. These, not surprisingly, tend to be the provinces for which foreign trade is most important-- Guangdong, Shanghai, Beijing, Liaoning, and Jiangsu--or those in which potential for increased foreign trade appear significant--Xinjiang, Guangxi, Ningxia, Hebei and Jilin.

For provincial (foreign trade) exports and imports, I have used a series from the General Administration of Customs, published in China's Latest Economic Statistics, February 1993, pp. 16-26. Note that 1992 was a year in which China's statistical collection system for foreign trade was in transition. From 1993 onward, we have complete data, from the Customs Administration, breaking down exports and imports into provincial totals both by location of the ultimate producing and purchasing enterprise as well as by location of the enterprise that carried out the export or import transaction. The data for 1992 are available only for location of the enterprise that carried out the export or import transaction, and covers 95% of exports, but only 74% of imports. The coverage of imports is more incomplete because trade by China's large centrally controlled foreign trading companies (FTCs) are not included in the provincial figures, and these large central-government FTCs mainly serve to import bulk commodities (grain, fertilizer, etc.), and feed them into the domestic distribution network. From the standpoint of the province, they are probably indistinguishable from domestic inflows.

Without adjustment, then, the data set understates the importance of foreign trade imports in total provincial inflows. However, we know the average magnitude of understatement: in our total, because we have figures for total imports and exports. The averages are used in the adjusted figures reported in Table 1. Provincial exports are understated by 5%: this is not significant in our context, and I have not imposed an additional adjustment on the data for exports.

The data set has a second shortcoming that may somewhat affect the allocation of flows to specific provinces: it is classified by location of the exporter/importer, rather than the ultimate producer. This may explain one of the anomalies in the data, the considerably large exports from Liaoning reported by Customs than by the I-O table, reflecting export from Liaoning of oil or other products produced further north. At one time, the distinction between producer and exporter was important, but gradually most provinces have gained control of their own export companies, and the difference for most provinces is not large. By inspecting data for the following year, 1993, we can see that only two provinces—Shanxi and Heilongjiang—produce significantly more exports than they transact (coal and oil respectively). These caveats are not large enough to affect our conclusions.

In all cases, I have used the Customs Data to measure foreign trade imports and exports. For the 15 provinces that do not break down inflows and outflows into domestic and foreign components, I have simply subtracted Customs imports and exports from total inflows and outflows. For the 10 provinces that do break down inflows and outflows into domestic and foreign components, I have substituted the Customs imports and exports for the I-O table imports and exports, but retained the I-O figures for domestic inflows and outflows. For Guangdong, where it matters the most, this is clearly the correct procedure. The figures in the I-O table correspond to the figures Guangdong province collected and published at that time on foreign trade. “Processing trade,” under which materials enter the province from Hong Kong duty-free, are processed for a fee, and then re-exported, are recorded only to the value of processing fees (in the same way that maquiladora trade in Mexico was originally counted). Since Guangdong procedures are consistent, and consistent with their reported value of domestic outflows, it would clearly be improper to adjust domestic flows to reconcile the total with the much larger Customs figures for exports and imports. For Fujian, however, where no breakdown is provided in the I-O tables, a similar problem might mean that I have underestimated Fujian’s domestic inflows and outflows.

The foreign trade data are collected and reported in US dollars. I have converted to Chinese currency units at the swap rate prevailing in 1992 (6.2 RMB/\$), rather than the official exchange rate. The swap rate probably reflects domestic costs and selling prices more accurately than the official posted rate. Moreover, using the swap rate yields a larger total value of foreign trade. Since this value is subtracted from total flows for 15

provinces, a higher value of foreign trade is unfavorable to my general argument that domestic trade is relatively large and important.

In addition, I have used a similar data set from Zhou Zhenhua 1996, pp. 131-37, which contains essentially the same information for 1987, based on the 1987 provincial I-O tables. I do not have specific information on how Professor Zhou has manipulated the data, but he provides a list of 25 provinces with their domestic inflows, outflows and imports, exports expressed as a share of provincial GDP. His import and export data can be checked with other foreign trade data, and they correspond closely in the overwhelming majority of provinces to a set of exports and imports by provincial trading bodies. This gives some confidence that his methodology is essentially the same as mine, which is reinforced by the underlying nature of the I-O tables. However, while his use of the foreign trade data increases confidence in methodological compatibility, the data he uses are too incomplete to be useful. In particular, the import data only covers one-quarter of total imports, and the export data 80% of exports. Therefore, some of Zhou's inferences are unreliable. There are two provinces for which we have 1992 data, but no 1987 data (Zhejiang and Qinghai), and two provinces for which we have 1987 but no usable 1992 data (Neimenggu and Heilongjiang). The omitted provinces may slightly bias our results, since Qinghai, Neimenggu, and Heilongjiang are relatively slow-growing provinces with lots of problems; Zhejiang, on the other hand, has grown extremely rapidly since 1978. Combining the two data sets gives comparable data for 23 provinces in 1987 and 1992.

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