

# What is wrong with Shanghai?

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## Abstract

This paper is based on and adapted from a chapter for a book project entitled Capitalism with Chinese Characteristics. The basic idea of the book is to get the facts right about China's reforms. For example, one chapter of the book on rural entrepreneurship refutes the notion that township and village enterprises (TVEs) were innovative, successful local government enterprises. Many Western economists, based on this idea of TVEs, have proposed elaborate theories to explain why China could succeed without private ownership. In reality, the label of TVEs was entirely a product of an arbitrary statistical reporting procedure in the Chinese system that reported all the non-farm business activities in the rural areas under a generic label called TVEs. A more detailed inspection of the data on the control structures of TVEs shows that *vast majority of TVEs as early as the mid-1980s were purely private firms*.

The idea of this paper/chapter is similar—to get the facts straight about Shanghai. The data come from household and indigenous private sector firm surveys and a comprehensive patent database. The largely descriptive analysis of these data shows that despite the impressive visual images of the city Shanghai has a surprisingly small entrepreneurial sector and troubled private-sector firms. While it is widely believed that Shanghai is the high-tech hub of China, Shanghai's patenting activities in fact experienced a steep decline vis-à-vis the more entrepreneurial provinces such as Zhejiang and Guangdong in the 1990s. One intriguing finding in this paper is that the national income accounting data—GDP per capita—show Shanghai to be much richer than the income data from the household surveys. Shanghai residents have the highest wage income in the country, but household surveys show that a typical Shanghai household has among the lowest income from asset ownership—interest income, dividend income and rental income—in the country and it has fairly low business income from self-employment businesses. One way to describe the “Shanghai model” is that the city has created the richest proletariat in the country but it has some of the poorest capitalists in China.

## What is wrong with Shanghai?

Shanghai has powerfully shaped how China is viewed both within the country and outside the country. Chinese leaders would like to showcase Shanghai to foreign visitors and foreign politicians and academics reciprocate with an enormous admiration of the city. Many of them view Shanghai as a symbol of the rise of China. Probably nowhere else in the world has Shanghai inspired more imagination—and despair—than in the Indian city of Mumbai (particularly during its monsoon season). Indian intellectuals and business people ask, often in great exasperation, “Why cannot Mumbai be more like Shanghai?” Indian politicians, while disagreeing almost on everything else, agreed on the need for Mumbai to emulate Shanghai. Jayant Patil, Finance Minister of the state of Maharashtra, recently asked, “Why can’t India plan bullet trains when China can smoothly roll hi-speed trains between Shanghai and Pudong covering a stretch of over 450 km in one hour?” Prime Minister Manmohan Singh, an Oxford-trained economist and a man steeped in humanistic values, also sees the heavy-handed Shanghai as a model. This is an excerpt from his speech given in March 2006<sup>1</sup>:

When I spoke of turning Mumbai into a Shanghai, many wondered what I had in mind. It is not my intention to draw a road map for Mumbai’s future. But I do believe that Mumbai can learn from Shanghai’s experience in reinventing itself; in rebuilding itself; in rediscovering itself.

Statements by Patil and Singh show a fascinating aspect of the Indians’ perception of Shanghai: The city is deeply admired in India but there is virtually no knowledge about the city. The high-speed train referred to by Patil travels not from Shanghai to Pudong but between two locations in Pudong. It does not cover 450 km but only 30 km and it completes its journey in eight minutes. It is unlikely that Prime Minister Singh has any detailed knowledge about how actually Shanghai generates economic growth and wealth creation and yet the presence in Shanghai of a dynamic economy and a wealth-creating machine is simply presumed.

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<sup>1</sup> The speech is printed on the website of Indian embassy to the United States. See [http://www.indianembassy.org/newsite/press\\_release/2006/Mar/35.asp](http://www.indianembassy.org/newsite/press_release/2006/Mar/35.asp), accessed on August 23, 2006.

Much of this source of admiration for Shanghai is visual in nature. Just look at Shanghai's impressive and imposing skylines and the conclusion is obvious. Simon Long of The Economist opined that India has been "lapped" in its race with China. Why? To Long (2005), the proof is in the contrast of his experience traveling to Shanghai and Mumbai. Going back to Shanghai was "a bewildering experience" as "[o]ccasionally, through the new skyscrapers, a familiar building appears, lost in the concrete jungle." Going back to Mumbai was infinitely more assuring. There was no new airport and the only innovation was an improved queuing system in the immigration hall. Long thus concludes, "Whereas its neighbor has been transformed out of all recognition, India has, in most visible essentials, stayed the same." Thomas Friedman, the influential New York Times columnist predicted Shanghai to be a great world-class city in the near future (Friedman 2000).

Academics are equally enthusiastic about the city. Doug Guthrie (2001), a NYU professor, who did his entire field research in Shanghai for his book, Dragon in a Three-Piece Suit, described Shanghai as "the head of the dragon." Shanghai is the vanguard of market reforms in China and, as he put it, is one of "the most legalistic and institutionalized areas." Like almost all the academic works touching on Shanghai, Guthrie produced no empirical evidence actually demonstrating Shanghai to be the vanguard of economic reforms. The fact is so obvious and one has only to assert it.

Yusuf and Nabeshima (2006), two economists at the World Bank, produced more data about Shanghai in their book, Postindustrial East Asian Cities. But almost all these data are essentially numerical equivalents of tourist pictures of Shanghai. These include the fact that Shanghai constructed more than 3,000 buildings taller than 18 stories since the mid-1990s, that it has a Maglev express train, the most advanced in the world, the massive restoration of its historic buildings to their original grandeur, and the new developments to revitalize Shanghai's cultural life.

The World Bank has long been enamored with Shanghai. In 2004, the Bank convened a large-scale international conference on poverty reduction in a posh Pudong hotel. In the 1980s, Pudong was a large tract of farmland. Today, it is a venue of five-star hotels, modern conference halls, business offices, and luxurious villas. The delegates of the conference had a chance to observe personally what China was supposed to have accomplished. One of the main themes emerging from the conference is that China succeeded in reducing poverty precisely because China did not protect its peasantry. Rapid

urbanization was the only way out of poverty, the Bank pronounced at the end of the conference. There was very little discussion on the effects of a state-led and often forcible urbanization program vis-à-vis those of a market-driven urbanization process.

It would seem preposterous to even ask the question, “What is wrong with Shanghai?” The purpose of this chapter is to show that plenty is wrong with the city. The basic idea is that the impressive skylines and the exalted GDP performance in fact mask a troubling reality—its indigenous corporate sector is deeply problematic. In this paper, I stay away from the usual indicators that economists use to look at China—GDP, export and FDI—but focus on the microeconomic dimensions of Shanghai. In particular, the state of entrepreneurship and the innovative activities in Shanghai have performed very poorly in the 1990s and in the 2000s even against some of the benchmarks that Shanghai should have trumped very easily (such as some poor, agricultural and interior regions of the country). Furthermore, some of the indicators show that Shanghai has performed poorly not only relative to others but relative to its own past in the 1980s and early 1990s.

Much of the hype about Shanghai is heavily based on impressions (and on GDP data). The “Shanghai miracle” is always assumed, but not demonstrated. The “tyranny of numbers,” in the words of Alwyn Young (1995), has led me to question the very foundation of this miracle. For this book project, I have assembled a large number of data from diverse sources—well-designed household surveys, private-sector surveys and a comprehensive, professionally-managed patent database. Apart from the fact that these data get at the important microeconomic dimensions of Shanghai, they have another distinct advantage over GDP and FDI data: GDP and FDI data are explicit benchmarks used by the Chinese political system to promote or demote officials. The data I will use are not used this way. Indeed there are some large, unexplained discrepancies between the survey data and the GDP data—namely that GDP data show Shanghai to be much richer than the survey data.<sup>2</sup>

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<sup>2</sup> For example, in 2004 GDP per capita of Shanghai was 55,037 yuan. The GDP per capita of urban Zhejiang in the same year was 28,869 yuan. The Shanghai/Zhejiang ratio is thus 1.92. But in the urban household survey, the per capita household income in 2004 was 18,501 yuan in Shanghai and 15,881 yuan Zhejiang. This gives rise to a Shanghai/Zhejiang ratio of 1.17. The discrepancy between these two ratios in and of itself does not suggest statistical falsification. One possibility is that the income share of GDP in Zhejiang is much

Here are some of the major findings based on a largely descriptive analysis of the aforementioned data.<sup>3</sup> By the two measures of entrepreneurship—self employment businesses and indigenous private sector firms, Shanghai compares poorly with the rest of the country along many dimensions. Shanghai has the highest GDP per capita in the country. In 2005, its GDP per capita was 12% higher than the second-highest GDP per capita in the country—that of Beijing and it is 3.66 times the national average. Yet the per capita income from operating self-employment businesses in Shanghai is a fraction of the national average in the rural-to-rural comparison and about the same as the national average in the urban-to-urban comparison.<sup>4</sup> The performance of rural entrepreneurship in Shanghai is especially remarkable. The Shanghai rural entrepreneurs have a huge locational advantage—by being located close to a massive, cosmopolitan and rapidly-developing metropolis. Yet, their per capita business income started out at 1.44 times that of the national average in 1985 but the ratio declined to 0.46 in 2005 during a twenty-year period of a supposedly massive boom.

Despite a rich history of creating some of the largest businesses in China and in Asia in the first part of the 20<sup>th</sup> century, the average size of Shanghai private-sector firms is among the smallest in the country by employment and is on the smaller side by sales. Despite the image of the city as a high-tech hub, the private-sector firms in Shanghai, on average, are less likely to hold patents and/or hold fewer patents than private sector firms based in the heavily agricultural, poor and interior province of Yunnan. Aggregate data on patenting activities—measured by annual patent grants—show that in the 1990s Shanghai experienced a steep decline in patenting activities relative to Zhejiang and Guangdong, two provinces that are the most entrepreneurial in China but are widely believed to be low-tech.

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higher than income share of Shanghai. If this is the case, then why the income shares differ so much between them is interesting to explore.

<sup>3</sup> The published household survey data are only available at a provincial level. Effort is being made to collect data on patents at the patent level. Private sector survey data are available at the firm level and this paper generates some regression results on the basis of the private sector survey data.

<sup>4</sup> Rural-to-rural comparison means comparing the rural vicinity of Shanghai with rural China; urban-to-urban comparison means comparing the urban part of Shanghai with the urban areas of China.

I will also show that Shanghai has the curious combination of being income-rich but asset-poor. Shanghai has the highest per capita GDP in the country and its wage level is high. Yet a typical Shanghai household has a smaller income from asset ownership than a typical household in far poorer provinces. The interest income—income from holding bank deposits—of a typical Shanghai household is extraordinarily small and it kept declining in the 1990s. And despite being located in the hottest real estate market in China, a typical Shanghai household received a rental income that was a fraction of the national average. One way to describe the ‘Shanghai model’ is that the city has created the richest proletariat in the country but it has some of its poorest capitalists.

Although I do not demonstrate this point directly in this paper, let me provide a hypothesis—and some rudimentary evidence—about the mechanisms of the ‘‘Shanghai model.’’ The key insight, I believe, has to do with the massive financial flows that the central government directed to the city in the 1990s. The mechanism was completely political. Herein lies a deep connection between Chinese politics and Shanghai’s growth model. In the 1990s, there was a rise of cadre of technocrats in the Chinese politics and many of them came from Shanghai. In the 1990s, the so-called ‘‘Shanghai gang’’ completely dominated the Chinese politics and they used their positions to shower massive resources on Shanghai. There was an element of crony capitalism involved in this allocation but I think that the main motivation was to use Shanghai to carry out the technocratic visions of these leaders.

In this paper, I first show that two kinds of entrepreneurship—self employment businesses and established indigenous private-sector firms—have been under-developed in Shanghai, relative to the country as a whole, to more entrepreneurial provinces and even to some of the poorest provinces in China. I will then show that one measure of innovation—patenting activities—shows Shanghai in a poor light. The concluding section offers some speculations about the mechanisms of ‘‘Shanghai model.’’

## **Entrepreneurship in Shanghai**

In 1992, a book with the title, *Shanghai: Her Character is Her Destiny*, became a best seller in China. The mayor of Shanghai, Wang Daohan, wrote a preface for the book. The book itself was sponsored by the Shanghai government to research the identity of the city. The main argument of the book is that Shanghai has a distinct culture in China and its culture is characterized by ‘‘its great tolerance, diversity, individuality, and entrepreneurship.’’

The book went on to assert that the renaissance of Shanghai in the 1990s owed much to the city's distinct cultural heritage.<sup>5</sup>

The claim that Shanghai is historically entrepreneurial is accurate. In the first three decades of 20<sup>th</sup> century, Shanghai was a major business and financial hub of Asia. It was the home of the country's biggest textile firms and banks. It was the founding venue of a number of firms that are still major MNCs in the world today, such as Hong Kong Shanghai Banking Corporation (HSBC) and American Insurance Group (AIG). A very powerful illustration of Shanghai's rich entrepreneurial heritage is the near absolute dominance of Hong Kong economy by the industrialists who left Shanghai in 1949.<sup>6</sup> During the take-off period of Hong Kong, the most important industry in Hong Kong was textile. The industry produced 47 percent of its export value and employed 45 percent of the workers as recently as 1977. Shanghai industrialists owned twenty-five—out of a total of thirty—cotton spinning mills in Hong Kong as of the late 1970s. Between 1947 and 1959, the Shanghai industrialists created twenty out of twenty-one cotton spinning mills established in that decade. It is not an exaggeration to say that Hong Kong miracle was a Shanghai miracle in disguise.

The claim that the boom in Shanghai in the 1990s is a product of its entrepreneurial culture, however, is quite problematic. This paper uses survey data to generate some preliminary findings about entrepreneurial activities in Shanghai. And the main finding is that entrepreneurial activities in Shanghai lagged significantly behind the rest of the country and that some dimensions of entrepreneurial activities in Shanghai atrophied over time. We use two sets of data. One set of data draws from the annual household surveys conducted by the National Bureau of Statistics (NBS). These are large-scale surveys. For example, the 1995 rural survey covered 67,000 households (0.03 percent of the rural population) and the urban survey covered 35,000 households (0.04 percent of the urban population). These household surveys are very well designed and China economists have relied on them heavily to undertake research on income distribution and savings behavior in China.<sup>7</sup> One part of these household surveys focuses on self employment and we will use data from this section of the

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<sup>5</sup> See Li (2001).

<sup>6</sup> For a very good account of the role of Shanghai industrialists in Hong Kong, see Wong (1988).

<sup>7</sup> One example is Kraay (2000).

surveys to look at entrepreneurial developments in Shanghai. (More details of these household surveys are provided in the appendix.)

The other set of data came from surveys on private-sector firms in China. Private sector firms can be considered as “entrepreneurial firms” in the Chinese context. They are overwhelmingly family-owned and they are much smaller than the incumbent business establishments, such as SOEs or affiliates of MNCs (although they are larger than the self-employment businesses.) Most of them are also first-generation entrepreneurial businesses in the sense that those with control rights are the founders of their firms. Thus these private-sector firms are considered entrepreneurial in our context both because their operators still bear the residual risks of ownership and that they disrupt the existing equilibrium in a Schumpeterian sense.

### ***Self-employment businesses in Shanghai***

The formal and legal name for self-employment businesses in China is individual household businesses. The technical definition of an individual household business is that it has a total employment of or under eight persons (including the business owners). This is the primary difference with the private-sector firms which we will look at next in that the private-sector firms are much larger in employment. In terms of their incorporation rights and responsibilities, the difference between an individual household business and a private-sector firm is quite minor. For example, all the individual household businesses and most of the private-sector firms have unlimited liabilities.<sup>8</sup>

We look at self employment activities both in urban and rural areas of Shanghai. The rural entrepreneurship is important in a number of aspects. First, while Shanghai is widely viewed as a sophisticated, cosmopolitan metropolis, a surprisingly high number of people

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<sup>8</sup> The difference in the size employment between these two types of businesses is entirely arbitrary. The origin of this designation goes back to the early 1980s when private sector development was ideologically controversial. One source of controversy then had to do with the issue of labor exploitation. Larger private-sector firms were viewed suspiciously because of their greater potential to exploit workers. Thus the policy environment for smaller private-sector firms—i.e., those employing less than eight workers—was made more favorable as a result.



still work in the rural areas. By employment, in 2004, 2.48 million worked in the rural areas out of a labor force of 8.36 million. Thus rural employment accounted for 29.7 percent of the employment (National Bureau of Statistics 2005 p. 369), although many of them have non-farm sources of income.

The second reason is that rural residents are, almost by definition, entrepreneurs. Farmers bear the residual benefits and risks of their production because agricultural production is organized as a business. Although a large number of rural residents in China work in rural enterprises as employees (such as township and village enterprises or TVEs), many of these rural enterprises themselves were started by rural entrepreneurs. We will look at the relative returns in rural Shanghai between self-employment earnings and paid employment earnings as a way to gauge the environment facing entrepreneurs in Shanghai.

Finally, we pay special attention to rural entrepreneurship in Shanghai because of our theoretical priors. We know from the early works of Schultz (1953) that urban/industrial centers exert a powerful boosting effect on the surrounding rural areas. Economic development emanates outward from the urban centers because the farmers in their vicinity have greater access to industrial inputs, opportunities to improve their human capital and non-farm business and employment opportunities. To the extent that this idea holds true in China, one would expect that rural entrepreneurs near Shanghai to have outperformed the rest of the country on average during the explosive growth period of the 1990s.

### **Rural self-employed businesses**

We start on the side of the production inputs—machinery and equipment in the production process—and then we will proceed to look at the earnings side of rural entrepreneurship in Shanghai. We undertake two kinds of comparisons. One is to compare Shanghai with the rest of the country; the other is to compare Shanghai across different time periods. It should be stressed that all the comparisons presented in the following paragraphs are rural-to-rural comparisons, i.e., we are comparing the rural households in Shanghai with rural households in the rest of China or rural households of another municipality (Tianjin). We are not comparing rural Shanghai with urban China or with urban Tianjin.

The two panels of Figure 1 present a number of ratios calculated on the basis of data on the book value of production-related fixed assets in the possession of rural households. Panel (1) presents ratios of Shanghai relative to the national average; Panel (2) presents ratios

of Shanghai relative to another municipality, Tianjin (population at 10.4 million in 2005). The latter comparison controls for a number of factors that may affect entrepreneurship, such as geographic proximity to urban and industrial hubs and the differences in the rural and urban administrations.

Figure 1 about here.

Panel (1) presents the ratios of the book value of production-related fixed assets per rural household in Shanghai relative to their national average values. The ratios are broken down in three ways. The first is a ratio of aggregate fixed assets; the second is a ratio of industrial fixed assets, and the third is a ratio of those fixed assets deployed only in service industries. Service industries here refer to construction, transport, warehousing/postal services, and distribution/catering services. We singled out industrial and service fixed assets because those industries should have thrived more rapidly given their close proximity to a huge urban economy such as Shanghai and therefore rural entrepreneurship in Shanghai should have benefited the most due to its locational advantage.

Data, in fact, point in the opposite direction. The size of the production-related fixed assets is uniformly smaller in rural Shanghai than in the rest of rural China. In 2001, the ratios are 0.53 for the fixed assets in all sectors, including agriculture, 0.27 for fixed assets in the industrial sector and 0.82 for fixed assets in the service sector. The small size of the industrial fixed assets in rural Shanghai is particularly noticeable. Shanghai itself is a large industrial economy and yet rural households located nearby do not seem to have benefited much from this fact.

Panel (2) presents the same three sets of ratios of Shanghai relative to another municipality, Tianjin. The purpose is to come up with an apple-to-apple comparison because we are comparing the rural areas in the vicinity of two major cities. The direction of the results is identical to those when we compare Shanghai with the country as a whole, except that Shanghai comes out even worse in the comparison. The ratios across all three categories in both 2001 and 2005 are smaller in the Shanghai-Tianjin comparison than in the Shanghai-national comparison (except for the industrial fixed asset ratio for 2001). One background factor is worth emphasizing. Tianjin is not known particularly for its economic dynamism in China. It attracted a far smaller level of FDI and it was not showered with the same degree of policy resources compared with Shanghai.

Another observation easily discernible in the data is that the fixed asset size of rural households in Shanghai actually got smaller relative to the rest of the country between 2001 and 2005. All three ratios are smaller in 2005 than in 2001. This is a remarkable development given that Shanghai economy expanded massively during this period. In nominal terms, GDP of the city expanded by 1.84 times between 2001 and 2005. The real GDP growth rates are 10.5 for 2001, 11.3 for 2002, 12.3 for 2003, 14.2 for 2004 and 11.1 for 2005. The comparison with Tianjin points to the same direction, except that the decline of Shanghai is even more steep. The decline of Shanghai's industrial fixed assets is particularly noticeable. It was 0.62 in 2001 but only 0.07 in 2005. Compared with Tianjin, Shanghai's rural households as industrial producers almost disappeared entirely.

We want to highlight one finding here—that the ratios of fixed assets in service industries in Shanghai declined from 0.82 to 0.56 between 2001 and 2005. This is an important finding because service industries are normally urban-intensive, i.e., while urban centers may decline as manufacturing hubs, normally they should expand in these service areas. In fact, the size of the two service components of GDP—transport/warehousing/postal services, distribution and catering services—nearly doubled in Shanghai, from 89.5 billion yuan in 2001 to 159.2 billion yuan in 2005.<sup>9</sup> Shanghai was abundantly endowed with business opportunities in these areas but the benefits of these opportunities did not accrue to its rural residents.

Let's turn to look at the earnings side. The NBS rural surveys provide income data in two ways. One is total income, which is the sum of cash income and income in kind. The other is just cash income. The reason that income in kind can be a large portion of a farmer's total income is because under the Chinese income accounting procedures the government imputes income to the unsold production possessed by the farmers. This income accounting procedure can be potentially very arbitrary and produces variances in income estimates across different regions. Throughout this chapter, we use income data denominated on the cash basis in order to minimize some of the cross-region variances in the accounting and reporting procedures.

We measure the earnings from self employment with what the NBS describes as “household business incomes” in its surveys. According to NBS, household business

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<sup>9</sup> The regional GDP are available from NBS (2006 pp. 63-64).

incomes derive from “rural residents using households as the production or business units” and from “production coordination and management.” The sources of the business incomes include agricultural production but also cover industry, construction, transport, distribution and all other non-agricultural activities. We undertake two types of comparisons. One is to compare per capita business incomes in rural Shanghai with the rest of the country; the other is to compare per capita business incomes in rural Shanghai with wage income. Wage income, according to NBS, is labor compensation and it is entered into the surveys on a separate line as the business income. Thus wage income is the closest proxy of earnings from the paid employment. The wage income data do not appear to include benefits.

Figure 2 reports these two components of per capita income in rural Shanghai as compared with the national average for 1980, 1985, 1990, 1995, 2000 and 2005. We present all the income data in two ways. One is based on the nominal values of the data; the other is based on the real values of the data. The real values are derived by deflating the nominal values to their 1978 price levels. The national data are deflated using the national consumer price index and the Shanghai data are deflated using the Shanghai consumer price index.<sup>10</sup>

Figure 2 about here.

Panel (1) of Figure 2 compares the level of Shanghai’s per capita business income with that of the national average. The ratios based on both the nominal and real business income data show an identical trend: Shanghai was improving relative to the rest of the country between 1980 and 1985 and then it began to decline sharply since 1985. (One should be cautious in drawing the conclusion that the ratio peaked in 1985. We do not have data for the years between 1985 and 1990 and it may be the case that the ratio peaked between 1985 and 1990.) The decline of the measure based on the real business income data is particularly sharp in the 1990s. Shanghai in the 1990s experienced a higher inflation than the rest of the country and Shanghai’s position deteriorated both because of the slow nominal growth of its business income and because of the *negative* growth of its business income in the 1990s. When deflated by the 1978 consumer price index for Shanghai, the per capita business income in rural Shanghai peaked at 282 yuan in 1985 and then it declined to 254.8 yuan in

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<sup>10</sup> The national consumer price index is available from NBS (2006). The Shanghai data were downloaded from the website of the Shanghai government, <http://www.stats-sh.gov.cn/2003shtj/tjnj/nj05.htm?d1=2005tjnj/C0901.htm>.

1990, 251.7 yuan in 1995, 196.2 yuan in 2000 and 198.5 yuan in 2005. It is important to emphasize this finding—that business income in Shanghai deteriorated both relatively and absolutely.

Panel (2) presents ratios of Shanghai's per capita business income to its wage income. This is to get at the relative returns story—the earnings from self employment compared with earnings from paid employment. This ratio peaked in 1985 and then it continuously declined since 1985. At its peak, the ratio is 0.86 in 1985; in 2005 it was 0.183. The ratio in 2005 is less than half of the ratio prevailing in 1980 (0.38). Because business income includes returns from agricultural production whereas wage income is most likely all derived from non-agricultural activities, the above comparison may introduce a bias. We may over-estimate the extent of the business income decline if farmers near Shanghai increasingly shifted from farm business activities to non-farm business activities. So Panel (2) also presents ratios of non-agricultural business income relative to wage income. Non-agricultural business income excludes income from primary industries. The results do not show any substantial improvements in the non-agricultural business income relative to wage income. There was a modest increase of the ratio between 1990 and 1995 but the ratio declined in other periods. A related observation is just how low the non-agricultural business income is relative to the wage income. The ratio never exceeded 0.1; the peak in 1995 is 0.07. There is very little evidence that rural Shanghainese were able to receive high business income streams from engaging in the non-agricultural activities.

But is the above finding driven by the fact that rural Shanghai experienced a usually fast growth in the wage income in the 1990s? Not at all. Panel (1) of Figure 3 presents the ratios of per capital wage income in rural Shanghai relative to the rest of the country. This time, the ratio peaked in 1990 and it then flattened out by the nominal measure between 1990 and 1995 and went into a sharp decline by the real measure of the wage income beginning in 1990. Throughout the period from 1995 to 2005, this ratio declined continuously. Recall the previous finding that the business income in rural Shanghai also deteriorated relative to the rest of the country in the 1990s and 2000s. So the rural Shanghainese failed to improve both sources of income—business income and wage income after 1990. The only difference appears that their business income began to fall relatively earlier, in 1985 or in the late 1980s, than their wage income. (The other difference, which is implied in the graph but not expressed explicitly, is that the growth of real wage income in

rural Shanghai was positive between 1980 and 2005, rather than negative, as in the case of the business income.)

Figure 3 about here.

The net effect of both declining business income and wage income positions is a deterioration of the income position of rural Shanghainese as a whole compared with the rest of the country. This is indeed the case. Panel (2) of Figure 3 presents ratios of per capita income in rural Shanghai relative to the rest of the country. That ratio climbed in the 1980s both in nominal and real terms. Between 1990 and 1995, the nominal data still show an improvement whereas the real data show a sharp decline (from 2.55 in 1990 to 2.27 in 1995). As of 2005, a typical rural Shanghainese was still better off compared with a typical rural Chinese but the differential is narrowed from 2.49 in 1980 to 1.82 in 2005.

### **Urban self-employed businesses**

We now examine self employment businesses in the urban part of Shanghai. Shanghai is heavily industrial so if rural entrepreneurship stagnated the impact may not be so severe if the urban entrepreneurship flourished. We first present data on the number of self-employed business owners per household in Shanghai, relative to the country as a whole and to the urban areas in two provinces, Zhejiang and Yunnan. Figure 4 presents the data.

Figure 4 about here.

Shanghai again underperformed. We have two sets of ratios. One is calculated on the basis of data on the number of individual business owners per household; the other is calculated on the basis of data on the number of employees working in the individual businesses. (As pointed out before, individual businesses also hire a small number of people, typically less than eight employees.) There are some interesting similarities and differences between these two measures of entrepreneurship. In terms of the similarity, on a per household basis, the ratio of Shanghai relative to the country as a whole is always less than one in the four years for which data are available, 1996, 1999, 2002 and 2004. This is in Panel (1).

There are also noticeable differences. One is that the ratios of individual business owners are significantly smaller than the ratios of individual business employees. For example, in 1999, one ratio is half of the other ratio. The other difference is that individual business owner ratio declined between 1996 and 2002. (The ratio rose slightly in 2004). The

employee ratio rose or at least held steady during the same period. Taking these two findings together suggests the possibility of the following dynamic: In Shanghai, relative to the rest of the country, the constraints on business ownership were both severe and were rising during this period but the constraints on employment were easing. So Shanghai discriminated more against capital providers but not the labor working for them.

Panels (2) and (3) compare Shanghai with Zhejiang and Yunnan, respectively. Zhejiang is known for being the most entrepreneurial province in China; Yunnan, on the other hand, is a poor, multi-ethnic and heavily rural province. Shanghai performs badly against these two extreme benchmarks. In the business owner category, not a single ratio exceeded one and the ratio declined between 1996 and 2002. The other finding is very surprising. Despite its reputation as a laggard province, Yunnan in fact has a vibrant entrepreneurial population as benchmarked against Shanghai. The business owner ratio in Panel (3) is extraordinarily low, 0.39 in 1996 and then 0.21 in 2002. A further finding is consistent with what is reported on benchmarking Shanghai against the national data: Shanghai is a better place for employees than it is for business owners. The contrast with Yunnan here is especially sharp. The ratios in the employee category all exceed one but the ratios in the owner category are a fraction of one.

Let's look at the earnings side. Figure 5 presents the per capita wage income and the per capita business income of Shanghai compared with the rest of the country and with one entrepreneurial province and with one laggard province. A worker derives his wage income from working for businesses owned by others and an entrepreneur derives her business income from owning and managing a business. So these two measures come close to measures of returns on labor and returns from business operations. (We show separately what happened to Shanghai's returns on financial assets.) Shanghai has very high levels of wage. All the ratios in Panel (1) of Figure 5 are about 50 to 100 percent larger than one (or near one as in the case of Shanghai/Zhejiang ratio in 2002). Also the three ratios—relative to China as a whole, to Zhejiang and to Yunnan—increased from 2002 to 2004. Shanghai workers thus earned higher wage incomes over time.

Figure 5 about here.

In contrast, the business income level in Shanghai is significantly lower. Except for 2002, the per capita business income in Shanghai is comparable to the country as a whole and to Yunnan province. The ratios for 1996, 1999 and 2004 are close to one. In comparison

with Zhejiang, however, the per capita business income in Shanghai is significantly lower and is decreasing over time. The ratios hovered around 0.6 in 1996, 1999 and 2002 and then decreased to 0.4 in 2004. Shanghai has a higher GDP per capita as compared with China as a whole and with Zhejiang and Yunnan. Yet its entrepreneurs are doing as well as those in China as a whole and as those in Yunnan but they are doing significantly worse than entrepreneurs in Zhejiang.

To summarize our findings so far, we can lay out the “Shanghai model” in the following terms. The city has created an attractive environment for factory or managerial jobs but the same environment has been detrimental to those with entrepreneurial inclinations and capabilities to start and operate small-scale businesses. So the city has the highest paid proletariat in the country but it has some of its poorest capitalists. One way to illustrate the latter point is to look at asset ownership in the city. We do not have data on asset ownership but we have some data on the returns from owning assets and property. Relative to their exalted income positions, Shanghai households turned out to have very low returns from property ownership and this is consistent with the portrayal that the city is income-rich but asset-poor.

Panel (1) of Figure 6 presents ratios of per capita property income of Shanghai households relative to households elsewhere. Property income is mainly comprised of interest income from holding bank deposits, dividend income from holding stocks, and rental income from leasing—mainly—real estate. Relative to all of urban China, the per capita property income of Shanghai households is between 0.6 (in 1996 and 1999) and 0.8 (in 2002) of the national average. There was a sharp increase in 2004, to about 1.3. This was mainly driven by the sharp growth of rental income in 2002 and 2004.

Figure 6 about here.

Another interesting finding is that the interest income in Shanghai is very low. The ratio is less than one except in 1999 when it was 1.03 and the ratio declined from 1.03 in 1999 to only 0.4 in 2004. Thus while Shanghai increased its wage payments during this period, the returns on bank deposits were decreasing at the same time. Panel (2) of Figure 6 compares Shanghai with Zhejiang, the most entrepreneurial province in China and the same patterns hold in that comparison.

Table 1 presents the actual yuan amount of various components of household incomes in urban areas of several provinces. And it shows that a typical Shanghai household



in 2004 received a smaller property income compared with a typical household in the urban part of the poor Yunnan province.

Table 1 about here.

### ***Entrepreneurial firms in Shanghai***

We define “entrepreneurial firms” as indigenous private-sector firms. This definition makes sense in the Chinese context. In an economy dominated by SOEs and, increasingly, MNCs, indigenous private-sector firms are entrepreneurial in a Schumpeterian sense. They are also entrepreneurial because many of them are still run by their founders. So unlike managers in SOEs and MNCs, the managers of these private sector firms bear the residual risks and benefits of ownership. They also fit with a behavioral definition of entrepreneurship. These firms are very nimble, completely profit-driven and market-driven. This is one attribute emphasized by writers such as Frank Knight (1921) and Israel Kirzner (1979).

To compare the state of the private-sector firms in Shanghai with those elsewhere in the country, we rely on one of the most well-designed and systematic survey projects in China—the private sector survey regularly conducted by the All-China Federation of Industry and Commerce, the organization that represents the private sector. These surveys were conducted in 1993, 1995, 1997, 2002 and 2004. The findings in this paper are based on the 1993 and 2004 surveys primarily and partially on the 2002 survey.

Both the 1993 and 2004 survey were nationwide. The 1993 survey sampled 1,440 firms and the 2004 survey sampled 3,012 firms. The sample selection is stratified by the economic development levels of a region. The private-sector surveys in this series focus on six types of regions selected on the basis of both political and economic criteria. The political criteria were: 1) the provincial capital, 2) a prefecture-level city, and 2) a county-level city. On economic criteria, the survey sampled firms located in the advanced, medium advanced, and least advanced areas. Within each region, the firms were randomly selected from the registration lists maintained by the local bureaus of industry and commerce.

The main questions of the survey cover (1) firm size, status of development, organization, and operation; (2) management system and decision-making style; (3) social-economic background of enterprise owners; (4) social mobility and network of owners; (5) source and composition of employees and employee-employer relations; (6) self-assessment

by entrepreneurs on a range of issues related to government-business relations, business environment, financing, and (7) income, expenditures and assets of entrepreneurs.

The survey is biased toward the large private-sector firms in China as members of the All-China Federation of Industry and Commerce are more established firms. This bias is not a problem for this paper since our interest is to explore whether or not private sector firms in Shanghai are large or small relative to private sector firms else. We borrow insight from the economics literature that firm size is a function of legal and financial environment of firms net of other influences such as market size and industry characteristics (for example, Kumar, Rajan, and Zingales 1999). Our interest is to see if the private sector in Shanghai is large or small relative to the private sector in other parts of the country. Our theoretical priors are that Shanghai ought to have some of the largest private-sector firms given its large GDP, superior human capital formation, connections to the international markets, excellent infrastructures, and the city's long history of creating some of the largest businesses in China and in the world.

From the NBS household surveys, we have already seen that self-employment businesses in Shanghai are scarce and are less well performing compared with their counterparts elsewhere. One could argue that the reason for this is that Shanghai has an efficient *established* private sector. So Shanghai may have a size bias but it does not necessarily have a bias against private sector per se. It may like large entrepreneurial businesses but not small entrepreneurial businesses.

Our private sector survey contradicts this expectation. A descriptive analysis of the survey data shows that the indigenous private sector in Shanghai is massively under-developed. Panel (2) of Table 2 presents data bearing on the size of private sector firms. We have two indicators. One is the average and the median values of sales per firm; the other is the average and the median number of employees per firm. Panel (1) presents data on urban per capita income of these regions and their percentage shares of non-agricultural employment. We have data for 1990, 1992, 2001 and 2003.

Table 2 about here.

Shanghai under-performed just about in every dimension. Its firm size is not just smaller than rich and entrepreneurial provinces, such as Zhejiang and Guangdong; it is smaller than the firm size in Yunnan. Recall the previous finding, based on NBS household surveys, that the average business income and property income are higher in Yunnan than in

Shanghai. Now we know the reason why—Yunnan has a more developed private sector. Yunnan is much poorer than Shanghai. The urban income in Yunnan was about half of that of Shanghai in 1996, as shown in Panel (1). In fact the economic gap is much bigger. Yunnan has a sizable agricultural sector. Its non-agricultural employment is about one-third of that of Shanghai. The per capita GDP of Yunnan in 1996 was about one-sixth that of Shanghai. Yet not only does Yunnan have bigger private-sector firms, it has *substantially* larger firms. As shown in Panel (2), in 2003, Yunnan firms on average are 87 percent (38.8/20.8) bigger by sales and 457 percent bigger (260.3/46.7) by employment than Shanghai firms.

Shanghai firms look especially poor when the firm size is measured by employment per firm, the most frequent measure of firm size used by economists. The average employment per firm in 2003 is 46.7. This compares with 260.3 persons in the poorer and agricultural Yunnan and 299.8 persons in Zhejiang and 319.6 persons in Guangdong. The last row of Table 2 presents data on all the surveyed firms in China. Shanghai firms are smaller in sales or employment than the national average in all the years for which data are available (1990, 1992, and 2003).

In fact the state of Shanghai's private sector is even worse than what is portrayed above. Let's look at some data in more detail. In addition to the average size of sales and employment, I have also included median values. This is so for a reason. Median values are a better reflection of middle-sized firms. Several studies have shown that there is a "middle-sized firm" problem, i.e., a difficult business environment may not be detrimental to small firms or large firms but may place an onerous burden on the firms in the middle. The reason is that small firms are nimble enough to evade the regulatory imperfections and the large firms have the political and financial power to overcome them. Middle-sized firms have neither.

Shanghai exhibits a classic symptom of a "middle-sized firm" problem. The median values of sales and employment are much smaller than the average values would indicate. Take as an example the Zhejiang/Shanghai comparison. Measured in terms of sales, the Zhejiang/Shanghai ratio in 2003 is 4.4 for the average measure but 5.2 for the median measure. The differential between the average and the median measures is of the similar magnitude for other paired comparisons as well (i.e., the differential in the median measure is always larger than the differential in the average measure).

The employment measure shows an even more remarkable development: The median employment declined for Shanghai firms between 1992 and 2003. This is telling on several accounts. One is that the average employment rose during the same period so this suggests that Shanghai is easier for large firms than it is for smaller firms. Second, Shanghai bucked the national trend. In every other province and in the sample as a whole, both the average and median employment rose between 1992 and 2003.

The above findings are based on a descriptive reading of the survey data and one might object that these findings do not sufficiently control for factors that might account for some of these differences between Shanghai and other regions. It is important to keep in mind that our priors ought to be very strong that given its good fundamentals and history Shanghai firms ought to be more developed than firms elsewhere. So the finding that Shanghai firms are less developed even compared with firms located in the poor Yunnan province is quite surprising.

But to allay fears about confounding influences on firm size, let me undertake a simple regression analysis to control for factors such as industry characteristics, the rural/urban location of a firm, the age of a firm, etc. The purpose here is not to explain the size of firms but to demonstrate the size of Shanghai firms after controlling for those factors affecting firm size. Table 3 presents the OLS estimates of the size of private-sector firms as measured by employment. The dependent variable is the log value of number of employees at the time of the survey. The 2004 private-sector survey provides 15 industry breakdowns and we include industry dummy variables to control for industry characteristics. We also control for the age of the firm and three rural dummy variables—whether the firm was founded in a rural area, whether the firm has its main production facility in the rural area and whether the firm is headquartered in the rural area. We arrive at the OLS estimates in three ways—1) including firms in all fifteen industries, 2) including firms in the manufacturing industry only, and 3) including firms only in service industries. Service industries refer to construction, transport, distribution/catering, finance, real estate, social services, healthcare, education, and science/technology. Our assumption is that these service industries are urban intensive and Shanghai firms would perform relatively well at least in these industries, if not across the board.

Table 3 about here.

There are thirty-one provinces in the private-sector survey so I coded thirty-one provincial dummy variables. In the OLS regression, the Shanghai dummy variable is omitted so all the other provinces are benchmarked against Shanghai. Shanghai firms would be larger compared with a province, *ceteris paribus*, if the dummy variable for that province is negative and statistically significant. Shanghai firms would be smaller otherwise. Table 3 arrays the provinces according to their economic size relative to Shanghai. At the top of the table are the poorest provinces in China and at the bottom are the richest provinces. We use the GDP per capita for 2003 to array these provinces. Guizhou, the poorest province in China, has a per capita GDP that is only 0.077 of Shanghai; Beijing, the second richest region in China—Shanghai being the richest—has a per capita GDP that is 0.686 of that of Shanghai.

The regression analysis yields identical results as the descriptive analysis. Controlling for industry characteristics, rural locations, and firm age, Shanghai firms are undersized relative to 24 out of 30 provinces and there is no statistical difference between Shanghai and the remaining six provinces. This finding on the undersize of Shanghai firms holds regardless whether we include firms in all the industries, firms only in manufacturing industry or firms in the service industries. The only difference is that in the manufacturing sample, Shanghai firms are undersized relative to 19 out of 30 provinces and in the service industry sample, Shanghai firms are undersized relative to 13 out of 30 provinces. It is important to emphasize that across all three regression specifications, not a single provincial dummy is simultaneously negative and statistically significant at the conventional level.

Another finding is worth highlighting. Shanghai firms are undersized not only relative to rich provinces such as Guangdong and Zhejiang but also relative to some of the poorest provinces in China—such as Guizhou, Guangxi, and Sichuan. These three poor provinces have a per capita GDP that is of 0.077, 0.128, and 0.137 of that of Shanghai. Henan province, with a per capita GDP 0.162 of that of Shanghai is the median province in the array. Of twenty-four provinces with larger firm sizes than in Shanghai, twelve are richer than Henan and eleven are poorer than Henan and one is Henan itself. The level of per capita income does not correlate in any systematic way with probability of Shanghai being undersized.

We use employment size because this is a measure frequently used by economists in this type of work. One objection is that this measure may not be an accurate indicator of the

entrepreneurial environment. For example, Shanghai may be too expensive for running large-scale labor-intensive operations and thus it is natural that Shanghai should have smaller firms as measured by employment. But if this is the case, then a rich but entrepreneurially-friendly province would also have a smaller firm size. We thus apply the same regression analysis to a specification that uses Zhejiang as the benchmarked province, rather than Shanghai. Zhejiang has the most dynamic entrepreneurial sector in China and it is also rich. It is ranked fourth in the country in terms of GDP per capita. The results show that twelve provincial dummies are negative and statistically significant and only two are positive and statistically significant. This finding refutes the notion that the employment measure only picks up the income effect, not the effect of the entrepreneurial environment.

Shanghai firms do significantly better when we use log value of sales as the dependent variable. Nine provinces have smaller firms than Shanghai (i.e., their coefficients are negative and statistically significant at the conventional level). Ten provinces have larger firms in Shanghai at the 10 percent level of significance test. (There are three additional provinces that have positive coefficients at 11 percent significance level.) But contrast this finding with Zhejiang. In the regression benchmarking against Zhejiang, eighteen provinces have negative and statistically significant coefficients and not a single positive provincial coefficient is statistically significant.<sup>11</sup>

## **Is Shanghai innovative?**

Stephen Green, an economist at UBS based in Shanghai, wrote that Shanghai authorities liked to treat foreign visitors with a tour of Fuxing Group, a Shanghai's based private sector pharmaceutical firm. The purpose was to showcase "Shanghai's vibrant private, high-tech economy," Green observed (p. 153).

There are at least two errors in Green's observation—that Shanghai has a vibrant private economy and that its economy is high-tech. I have already shown that in terms of business income and income from holding assets Shanghai is remarkably poor, not just in comparison with the entrepreneurial Zhejiang and Guangdong but also in comparison with some of the poorest regions of China. In this section I will deal with the second of Green's observation—that Shanghai has a high-tech economy. We first look at the results of

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<sup>11</sup> The results are not shown and are available from the author upon request.

analyzing the 2004 private-sector survey and then present some aggregate data on patenting activities.

### *Private-sector surveys*

We use a measure of technological development that is probably as good as any—patenting activities. Patenting is widely used by economists as a measure of innovations or competitiveness of firms or regions. The idea stressed in the literature is that firms are naturally motivated to build up their intellectual property rights in order to gain a competitive edge in the marketplace.<sup>12</sup> Competitiveness is a complex phenomenon but patent data provide a convenient starting point to assess whether Shanghai firms are competitive vis-à-vis firms elsewhere in China.

There is also a Shanghai-specific reason to look at patenting activities. Shanghai itself has endeavored to become the high-tech hub in China and the government has poured substantial resources into the high-tech industries. The Shanghai government has an explicit industrial policy targeting R&D and industrial upgrading. For example, in the 1990s, the Shanghai government closed down many textile factories on the ground that the textile industry was a sunset industry. Instead the government has turned to support automobile industry and microelectronics. Foreign analysts, as usual, are very impressed with what Shanghai has done. In a book titled Technological Superpower China, Jon Sigurdson (Sigurdson, Jiang, and Kong 2006), a professor at Stockholm School of Economics, argues that “Shanghai’s economic development is based on the twin pillars of knowledge creation and knowledge applications.” Given this perspective on Shanghai, it is only appropriate to ask the question whether or not Shanghai firms are actually innovative.

Let’s revisit Table 2 Panel (3) of that table presents descriptive data on the state of technology on the part of indigenous private sector firms in Shanghai compared with their counterparts elsewhere. We present data on the percentage share of firms which hold patents and of those patent-holding firms the average number of patents they hold. We also have data on whether or not a firm has developed its own products and if it has, how many. As always we benchmark Shanghai against other regions of China and we include a variety of

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<sup>12</sup> For a comprehensive treatment of issues on patent and a good summary of works, see Jaffe and Lerner (2004).

provinces to represent geographic characteristics, different growth models, and different developmental stages. For example, Jiangsu and Zhejiang border with Shanghai. Guangdong and Zhejiang represent an entrepreneurial growth model. Yunnan is poorer and more agricultural.

Fewer Shanghai firms hold patents than the firms in all the benchmarked provinces in 2003, including firms in Yunnan. To the extent they do hold some patents Shanghai firms hold fewer patents than the firms in other provinces, except for Yunnan. In 2001, Shanghai firms performed marginally better vis-à-vis firms in Jiangsu and in Yunnan. It is a similar story when it comes to product developments. For two years in which data are available, Shanghai firms under-performed—i.e. having fewer products developed by the firm—than all the firms in the benchmarked provinces and against the national average.<sup>13</sup>

Statistical analysis yields a similar finding.<sup>14</sup> We use the number of patents as the dependent variable in regressions with the provincial dummies and the same set of controls we used in regressions on the size of firms. The 2004 private-sector survey also asked the respondents to provide information on the number of products developed in-house. We also use this measure to assess the innovativeness of Shanghai firms. We restrict our analysis to manufacturing firms only since these two measures are most germane to manufacturing firms. In terms of patents held by firms, Shanghai firms are outperformed by firms in four other provinces and they do not outperform firms in any other provinces. In terms of in-house product developments, Shanghai firms are outperformed by firms in six other provinces and they do not outperform firms in any other provinces. There is no evidence whatsoever that Shanghai firms are more innovative than firms elsewhere and this finding, combined with the finding that Shanghai firms are unduly small, points to the problematic state of Shanghai's private sector.

### ***Aggregate patent data***

I have cross-checked several sources on Chinese patents. Chinese patent data, unlike its economic data, are quite consistent across different sources and are clearly labeled and

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<sup>13</sup> Ideally, we would want to show a longer series of data but the private sector surveys only began to collect data on patents in 2002.

<sup>14</sup> The results are available upon request.



well defined. The annual patent application and grant data are published in Chinese Statistical Yearbook from 1988 to 2006. In addition, I have drawn on two specialized publications on Chinese science and technology. These are NBS and Ministry of Science and Technology (1999) and (2002).<sup>15</sup> All the patents used in this paper refer to patents granted by the Chinese patent authorities. Otherwise unless noted, all the patent data refer to patent grants rather than patent applications.

We compare the patenting activities in Shanghai with two of the more entrepreneurial provinces in China, Zhejiang and Guangdong. Figure 7 presents the ratios of Shanghai's annual patent counts to those of Zhejiang and Guangdong, respectively. Panel (1) graphs the ratios of all the patent grants from 1987 to 2005 and Panel (2) shows the ratios of invention patents only and excludes the two other categories of patents, utility model and design. Invention patent applications go through a more rigorous examination for utility, novelty, and non-obviousness. The utility model and design patents are held to a less substantive scrutiny. Incremental improvement, rather than novelty, is required for these two categories of patents. The protection coverage is longer for invention patents. Under the Chinese Patent Law the invention patents enjoy protection for 20 years whereas the protection is only for 10 years for the other two categories of patents.<sup>16</sup>

Figure 7 about here.

Panel (1) shows a steep decline in Shanghai's patent ratios relative to Zhejiang and Guangdong between 1987 and 2005. In 1987, Shanghai had about three times the patent

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<sup>15</sup> All the patent data that will be presented in this section refer to patents granted to domestic residents. China's patent data also include patents filed by foreign residents—firms or individuals operating in China. I exclude those for the purpose of illustrating “newness” of products or technologies. Including patents filed by foreigners complicates the patent counts because the Chinese law does not recognize patents registered outside of China and therefore foreign firms have to register their patents in China in order to access patent protection in China. Thus the high levels of FDI would automatically push up the patent counts, not necessarily suggesting inventions of new products or new technologies.

<sup>16</sup> For a succinct description of the main features of the Chinese patent system, see Hu and Jefferson (2006).

grants as Guangdong and 1.8 times as Zhejiang. In 2005, the ratios are 0.34 and 0.88, respectively. Except for a blip in 2003, Shanghai consistently under-performed Zhejiang and Guangdong. The ratio vis-à-vis Zhejiang was all smaller than unity except for 2003 and it was less than unity vis-à-vis Guangdong in all the years between 1990 and 2005. Shanghai began to improve somewhat in the second half of the 1990s. Its patent rank hovered between No. 9 and No. 10 in the first half of the 1990s and then between No. 6 and No. 8 in the second half of the 1990s. In 2004, Shanghai's ranking improved to No. 4 in the country, after Guangdong (No. 1), Zhejiang (No. 2), and Jiangsu (No. 3).

It is important to separate invention patents from the other two categories of patents to see if Shanghai managed to maintain its edge in a more exacting innovative area. It turns out that Shanghai lost much of its initial and substantial lead in invention patents as well. Its decline vis-à-vis Zhejiang and Guangdong was less steep and less linear, as the staggered lines in Panel (2) of Figure 7 show. But a clear declining trend is visible in the graph. The sharpest decline again occurred in the late 1980s and early 1990s, although, compared with the utility model and design patents, Shanghai largely stemmed its decline in the invention patents vis-à-vis Zhejiang in the second half of the 1990s. However, Shanghai continued to lose to Guangdong.

There are a number of factors to consider when looking at this long decline of Shanghai. For one thing, Shanghai started out with a huge advantage, not only in the level of patenting activities but also with a richer endowment of those factors conducive to patenting. It had far more engineers, scientists, and universities than Zhejiang and Guangdong. In 1981, for example, there were 87,000 college students enrolled in Shanghai. Zhejiang and Guangdong had about half of this number.<sup>17</sup> In 1981, in terms of engineers,

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<sup>17</sup> The 1981 data are from (1982, p. 443 and p. 454). The number on engineers and scientists refers to those working in the SOEs only. In 1981, however, this is likely to match exactly what the total number of engineers and scientists was. The number of college students does not begin to describe the full difference in terms of the level and the quality of human capital. Shanghai is the home of some of China's best-known universities, such as Fudan and Jiatong. Zhejiang University, a historically strong academic institution, is usually ranked below these two Shanghai universities. The Sun Yat-sen University in Guangdong is considered as a second-tier institution.

Shanghai's numeric advantage to Zhejiang was 2.8 and to Guangdong, 1.6. The gap was even greater in terms of the number of research scientists. The ratio of Shanghai to Zhejiang was 5.9; to Guangdong, 2.37. Shanghai also spent far more on R&D. The earliest figures we have are for 1992 and the data only cover the R&D spending of the large and medium industrial enterprises. Shanghai firms spent 2.4 times on R&D than Zhejiang firms did and 1.89 times as the Guangdong firms did (See National Statistical Bureau 1993, Table 18-59, p. 759).

Also a number of legislative changes should have favored Shanghai. In 1993, the Chinese Patent Law was amended to extend protection to previously uncovered areas, such as pharmaceuticals, food, beverages, flavorings, and chemical compounds. In many of these areas, Shanghai firms possessed formidable pre-existing capabilities. Yet there is very little evidence that Shanghai firms patented more aggressively as a result of the 1993 legislative change.

In their paper on Chinese patents, Hu and Jefferson (2006) noted “a patent explosion” in China since 2000 and they attribute this explosion to the inflows of FDI after China joined WTO in 2000. This explanation sits less well with the cross-regional distributions of patenting activities. The fact is that Zhejiang and Guangdong experienced a patent explosion in the late 1980s long before WTO. Also Zhejiang patented aggressively despite the fact it has received very little FDI. Both Shanghai and Guangdong are large recipients of FDI but their patenting activities differed substantially.

Another finding in Hu and Jefferson (2006) accords better with our findings here. They found that private-sector firms have the highest propensity to patent as compared with SOEs or even with affiliates of MNCs. Thus one hypothesis to explain this decline of Shanghai vis-à-vis Zhejiang and Guangdong is that Shanghai has repressed the part of the economy most likely to innovate—its entrepreneurial sector. And it is in this connection that the two parts of this paper on the microeconomic dimensions of Shanghai reinforce each other in generating an empirically more accurate portrayal of Shanghai.

There may be two alternative hypotheses. One is that because we are comparing total patent counts we are not controlling for the potential pool of firms or institutions that generate patents. Guangdong and Zhejiang may simply have a larger pool of potential patent-generating firms. This hypothesis is difficult to test because we do not have a measure of the potential pools of the patent generations. However, it is important to stress that Shanghai led Zhejiang and Guangdong in the 1980s by a huge margin in total patent counts.

So if the declining curves in the graph are a result of expanding pools in Guangdong and Zhejiang, then the appropriate question is why the potential pool of patent generations expanded in these two provinces but it shrank in Shanghai. In fact, this is the crux of the entire issue: Zhejiang and Guangdong enabled the firms based there to become more innovative or provided a business environment attracting more innovative firms to them. That fact itself suggests some substantial differences between Shanghai on the one hand and Zhejiang and Guangdong on the other.

The second hypothesis is that this is a natural technological diffusion story whereby laggard provinces catch up with the leader. However, this explanation does not quite accord with a number of features in the data. Notice that the speed of Shanghai's decline was particularly dramatic in the late 1980s and the early 1990s. In 1987, the ratio was 1.8 vis-à-vis Zhejiang and 3.18 vis-à-vis Guangdong. In four short years, the ratios fell below one for both Shanghai/Zhejiang and Shanghai/Guangdong pairs. The logic of the diffusion story would suggest a smoother decline stretched over a period of years.

The other fact does not sit well with the diffusion logic. If the technological diffusion is the only driver behind the rise of Zhejiang and Guangdong, then we would see Shanghai's decline to be primarily concentrated in the less demanding areas of utility model and design patents, not in the invention patents. It is only natural that the backward regions first master the less sophisticated technologies. It is an incremental process. But as we see in the data, Shanghai lost its edge vis-à-vis Zhejiang and Guangdong also in the invention patents as well.

### **Some concluding remarks**

In this part of the paper, let me speculate about the actual mechanisms of the "Shanghai model." Let's revisit Figure 7. There was a dramatic decline of Shanghai in the area of patenting activities between 1987 and 1991. This period warrants some special attention. This was a critical period for both Shanghai and for China. For Shanghai, much of the model that guided its development in the 1990s was laid down during this period. The plan to develop Pudong was conceived in 1986 and was formally unveiled in 1990. The Pudong development project, in essence, was a massive state-led government project. Many of its core features were fundamentally anti-entrepreneurial. For example, a huge tract of

land was forcibly acquired by the state at a price far below the market value. Small-scale entrepreneurs often run businesses that are land-intensive.

The second important detail about this period is that Jiang Zemin and Zhu Rongji were the Party secretary and the mayor of Shanghai, roughly from 1986 to 1991. Jiang and Zhu are widely regarded as the consummate technocrats in China and yet they presided over the worst technological performance of Shanghai. In 1987, when these two leaders began their tenure in Shanghai, there were 575 patents awarded to individuals and institutions located in Shanghai. This was second in the country, next to Beijing (776 patents granted). In 1991, immediately after they left Shanghai, Shanghai's position slipped to No. 9 in the country in terms of the patents granted. In that year, Shanghai, with 1,025 patents, was not just behind Beijing (2,369 patents) but also behind two of China's biggest agricultural provinces, Hunan with 1,174 patents and Sichuan with 1,232 patents.

Understanding the patent performance under Jiang and Zhu in Shanghai holds a critical insight for us to understand China in the 1990s. These two Shanghai leaders left Shanghai in the late 1980s and early 1990s to rule China for the rest of the 1990s. Jiang was the Party Secretary of the Communist Party from 1989 to 2002. Zhu was the executive vice premier in charge of economic policy from 1991 to 1997 and then he was the premier from 1998 to 2003. Between two of them, they brought a large number of bureaucrats from Shanghai to the national government.

They rolled out and scaled up many of their Shanghai policies to the rest of the country. These policies include imposing or consolidating the political control of the city over the adjacent rural areas, heavy subsidization of FDI, targeting big firms for support, rapid scrapping of the existing capital stock, state acquisitions of land for huge industrial projects, and state-led urbanization programs closely modeled after Pudong. Shanghai began to implement many of these policies in the late 1980s and China began to do so in the mid-1990s.

The extremely poor performance of rural entrepreneurs in Shanghai as shown in Figure 1, Figure 2, and Figure 3 provides an important clue to understand Shanghai as well as China in the 1990s. I have shown elsewhere that the most entrepreneurial part of the Chinese economy is rural in nature and that in the 1980s rural entrepreneurship thrived across the country. The rural Shanghai performed very well relative to the rest of the country in the 1980s. Figure 3 shows that rural per capita income in rural Shanghai rose rapidly

against the rest of rural China in the 1980s and this is consistent with what the economic theory would predict—that rural areas near an urban center are best positioned for growth, as theorized by Schultz (1953). But Professor Schultz made his prediction assuming a market economy in place and the sharp decline of rural income—relative to the national average—in Shanghai suggests a rollback of market reforms in rural Shanghai in the 1990s.

A search in the archive of government documents unveils one development in Shanghai in the late 1980s. In 1987, Shanghai rolled out “A comprehensive development program for Shanghai.” This program laid out many of the key elements of Shanghai’s aspirations to transform itself into a world-class city in a short order. The program did not have the specifics of what became Shanghai’s hallmarks in the 1990s—the Pudong district, the Maglev train, etc.—but it laid out some mechanisms to achieve this goal. One mechanism was known as “integrated rural/urban planning” and a super municipal agency was set up to carry out the planning. The agency was headed by Mayor Jiang Zemin. The idea of “integrated rural/urban planning” is that rural and urban economies should be planned in conjunction with each other and in a context of a planned economy this would inevitably suggest an extension of urban controls over the rural areas. This may be one reason why the rural entrepreneurship began to atrophy in Shanghai in the 1990s. The urban part of Shanghai economy in the early 1990s was completely state-owned; the rural part less so. Thus the integrated planning approach amounted to a takeover of a less state-controlled economy by an economy that was more state-controlled.

Finally, I believe that a critical piece of the puzzle is to understand the land policies of the Shanghai government. We know that in the 1990s the Shanghai government or its business affiliates have engaged in a massive real estate program. The basic mechanism is very simple. The government would reclaim the buildings and land from the incumbent residents and then lease the land to real estate developers. The government is the monopoly on the buy side and would pay far below the fair market value to acquire the land but it would sell or lease the land to the highest bidder. The program was massive. According to one estimate, between 1992 and 1997, the government demolished 22.46 million square meters of building area and 541,400 households were displaced (Zhang 2002).<sup>18</sup>

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<sup>18</sup> The Shanghai government justified this program as an effort to clear the “slum areas.” But a commonsensical reasoning would refute this rationale. In 1997, Shanghai had

The issue for this paper is to think about the effect of this land policy on entrepreneurship in Shanghai. Figure 6 shows that the per capita rental income in urban Shanghai is extremely low. The ratio relative to the country as a whole was 0.01 in 1996 and 0.3 in 1999. One explanation for this low returns on rental property is that the government restricted private land lease. This finding provides an important clue as to why small-scale entrepreneurship in Shanghai is so under-developed. Both rural and urban entrepreneurs run businesses that are land-intensive and/or that may be location-demanding. Rural entrepreneurs need land to build factories and they need space in the urban areas to hawk their ware. Urban entrepreneurs similarly need fixed points of services since many of them specialize in service provisions that require them to be in places of high population density. The tight control of land may have suppressed the entrepreneurial supply on the hand and on the other reduced the rental income to the average Shanghai households who otherwise could have leased their housing facilities to would-be service sector entrepreneurs. This explanation would explain why rental income per capita is much higher in the more laissez-faire provinces in China.

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about 4.8 million households. Displacing 541,400 households would suggest that 11 percent of Shanghai households lived in slums in the mid-1990s.

## Tables and Figures

**Table 1 Income and income structures of urban households in five provinces: Annual surveys, 2002 and 2004 (Yuan)**

	Annual per capita income	Income components:			
		(1) Wages	(2) Transfer payments	(3) Net business income	(4) Property income
<b>Panel (1) Shanghai</b>					
2002	14,396 (100)	8,975 (62.3)	4,891 (34.0)	436 (3.0)	94.4 (0.7)
2004	18502 (100)	13,157 (71.1)	4,624 (25.0)	507 (2.7)	215 (1.2)
<b>Panel (2) Entrepreneurial provinces</b>					
Zhejiang					
2002	12,682 (100)	8,534 (67.3)	3,185 (25.1)	761 (6.0)	202 (1.6)
2004	15,882 (100)	10,753 (67.7)	3,409 (21.5)	1,336 (8.4)	384 (2.4)
Guangdong					
2002	11,961 (100)	9,284 (77.6)	1,887 (15.8)	561 (4.7)	229 (1.9)
2004	14,953 (100)	11,646 (77.9)	2,197 (14.7)	738 (4.9)	371 (2.5)
<b>Panel (3) Laggard provinces</b>					
Jilin					
2002	6,523 (100)	4,295 (65.8)	1,673 (25.7)	486 (7.5)	68.5 (1.1)
2004	8,227 (100)	5,447 (66.2)	1,918 (23.3)	792 (9.6)	69.7 (0.8)
Yunnan					
2002	7,690 (100)	5,447 (70.8)	1,894 (24.6)	279 (3.6)	70.8 (0.9)
2004	9,546 (100)	6,138 (64.3)	2,555 (26.8)	518 (5.4)	334 (3.5)



**Table 2 The state of indigenous private sector in Shanghai, Various years**

	Panel (1) Regional indicators		Panel (2) Indicators of the size of private-sector firms					Panel (3) Indicators of the development of private-sector firms			
	Urban per capita income <sup>a</sup> , Yuan	% non-farm employment	Average (median) sales, Million Yuan			Average (median) employment, Person		% firms with patents (Average # of patents per holder-firm <sup>c</sup> )		% firms with own product developments (Average # of own products per firm)	
Regions/Year	1996	1996	1990	1992	2003	1992	2003	2001	2003	2001	2003
<i>Shanghai</i>	8,191	90.7	0.42 (0.17)	0.9 (0.34)	20.8 (2.8)	36.2 (23)	46.7 (16)	15.3 (3.7)	14.6 (2.97)	28.0 (16.7)	23.8 (9.2)
Zhejiang	6,960	58.1	1.0 (0.4)	2.4 (1.0)	91.6 (14.5)	49.5 (35)	299.8 (80)	17.4 (5.2)	22.1 (5.3)	42.1 (11.3)	40.1 (33.8)
Jiangsu	5,188	58.4	0.46 (0.0 b)	2.8 (0.35)	26.8 (5.4)	36.2 (12)	129.9 (53)	14.3 (2.3)	16.0 (3.1)	33.8 (8.6)	32.2 (7.9)
Guangdong	8,166	60.3	1.7 (0.45)	4.9 (1.3)	62.8 (8.4)	89.2 (38)	319.6 (60)	13.9 (5.7)	22.7 (7.9)	29.0 (8.3)	38.1 (36.2)
Yunnan	4,999	24.7	0.59 (0.0 b)	1.6 (0.4)	38.8 (4.45)	64.4 (30)	260.3 (47)	12.2 (1.8)	18.4 (2.67)	34.7 (2.7)	32.0 (4.1)
<i>National average</i>	4,844	52.2	1.4 (0.26)	3.8 (0.8)	34.0 (4.2)	61.3 (30)	166.7 (40)	16.6 (3.9)	15.7 (4.37)	34.3 (9.4)	29.6 (15.7)

Notes:

a: Based on the urban household survey data, not national accounting data.

b: Some of the median sales values are zero because the number is too small to be reported.

c: Refer to firms with patents/own products.

Sources: Urban Social and Economic Survey Team (1997), PSS1993, PSS2002 and PSS2004.

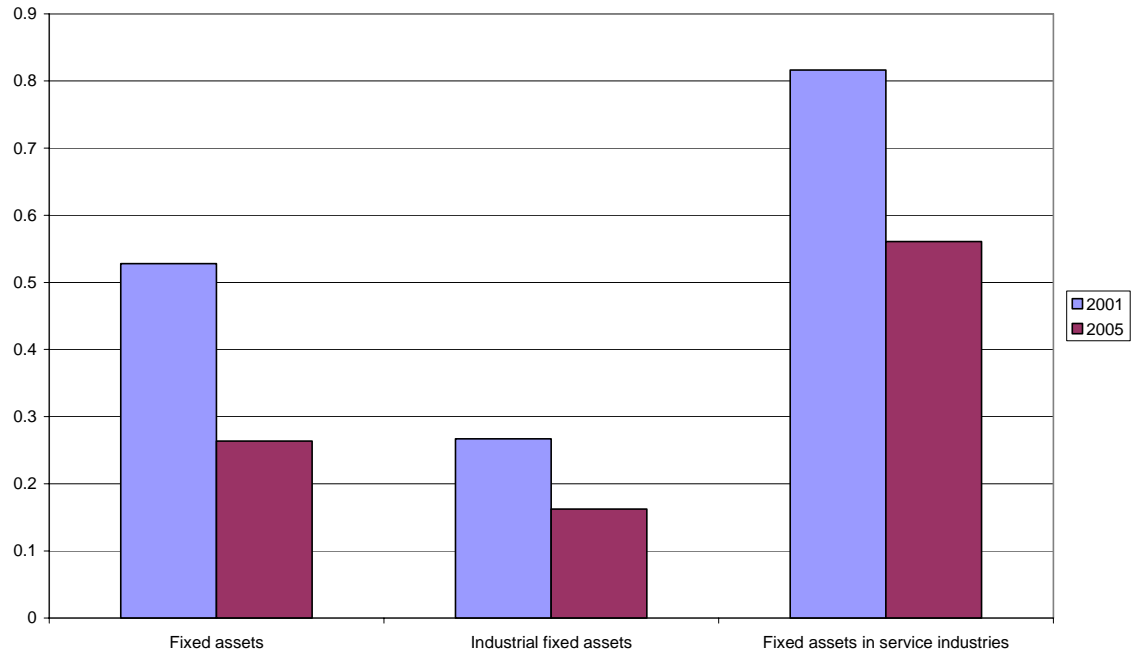
**Table 3 OLS estimates of the size of firm employment**

Dependent variable: Log value of firm employment		Independent variables: 1) Age of firms, 2) 14 industry dummies, 3) Dummies for rural location, 4) 30 provincial dummies with Shanghai being omitted					
		All industries		Manufacturing industries only		Service industries only	
Provinces	GDP per capita ratio to Shanghai (2003)	Coefficients	T-statistic	Coefficients	T-statistic	Coefficients	T-statistic
Guizhou	0.077	0.40	2.46	0.815	2.22	0.492	2.13
Gansu	0.107	0.013	0.09	0.158	0.50	-0.116	-0.56
Yunnan	0.121	0.29	1.6	0.489	1.12	0.117	0.51
Guangxi	0.128	0.48	2.93	0.867	2.85	0.244	0.97
Sichuan	0.137	0.536	3.87	0.892	3.3	0.237	1.17
Anhui	0.138	0.323	2.31	0.366	1.32	0.091	0.48
Shaanxi	0.139	0.279	2.11	0.479	1.57	0.109	0.62
Jiangxi	0.143	0.464	2.97	0.546	2.04	0.439	1.68
Ningxia	0.143	1.43	3.56	1.14	0.98	1.33	2.66
Tibet	0.147	0.142	0.28	-0.264	-0.32	0.257	0.23
Chongqing	0.154	0.75	4.8	1.18	3.52	0.334	1.67
Qinghai	0.156	0.778	4.26	0.92	1.86	0.611	2.38
Shanxi	0.159	1.34	5.55	1.35	2.71	1.21	3.72
Hunan	0.162	0.77	3.3	-0.11	-0.16	0.889	2.43
Henan	0.162	0.262	1.64	0.409	1.44	0.175	0.73
Hainan	0.178	0.152	1.06	-0.129	-0.30	-0.109	-0.57
Inner Mongolia	0.192	0.535	3.62	0.70	1.98	0.395	2.06
Hubei	0.193	0.233	2.06	0.83	3.68	-0.129	-0.80
Jilin	0.20	0.30	1.96	0.025	0.08	0.30	1.35
Xinjiang	0.208	0.245	0.98	0.34	0.63	0.175	0.41
Hebei	0.225	0.713	3.66	0.559	1.76	0.817	2.85
Heilongjiang	0.249	0.149	0.62	1.52	2.21	-0.233	-0.58

Shandong	0.292	0.564	5.32	0.71	3.81	0.261	1.62
Liaoning	0.305	0.318	2.25	0.433	1.73	0.225	0.93
Fujian	0.321	0.737	4.95	0.95	4.26	0.477	1.65
Jiangsu	0.36	0.577	5.43	0.863	4.69	0.267	1.75
Guangdong	0.368	0.52	4.82	0.803	4.23	0.185	1.14
Zhejiang	0.431	0.663	5.99	0.738	3.91	0.524	2.9
Tianjin	0.568	0.473	2.96	0.657	2.70	0.374	1.16
Beijing	0.686	0.716	5.17	0.579	1.77	0.700	3.92
# of positive (negative) coefficients at 10% significance level	25 (0)		19 (0)		13 (0)		

Figure 1 Book value of production-related fixed assets in rural Shanghai

Panel (1): Book value of production-related fixed assets per rural household:  
Shanghai/national average ratios, 2001 and 2005



Panel (2): Book value of production-related fixed asset per rural household: Shanghai/Tianjin ratios, 2001 and 2005

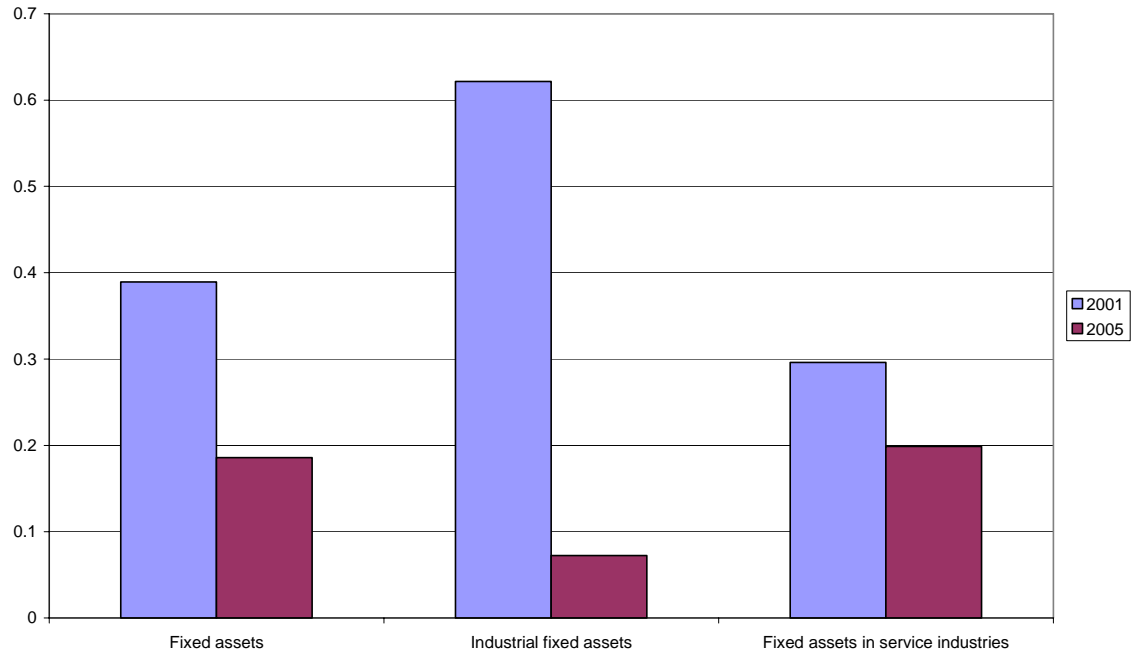
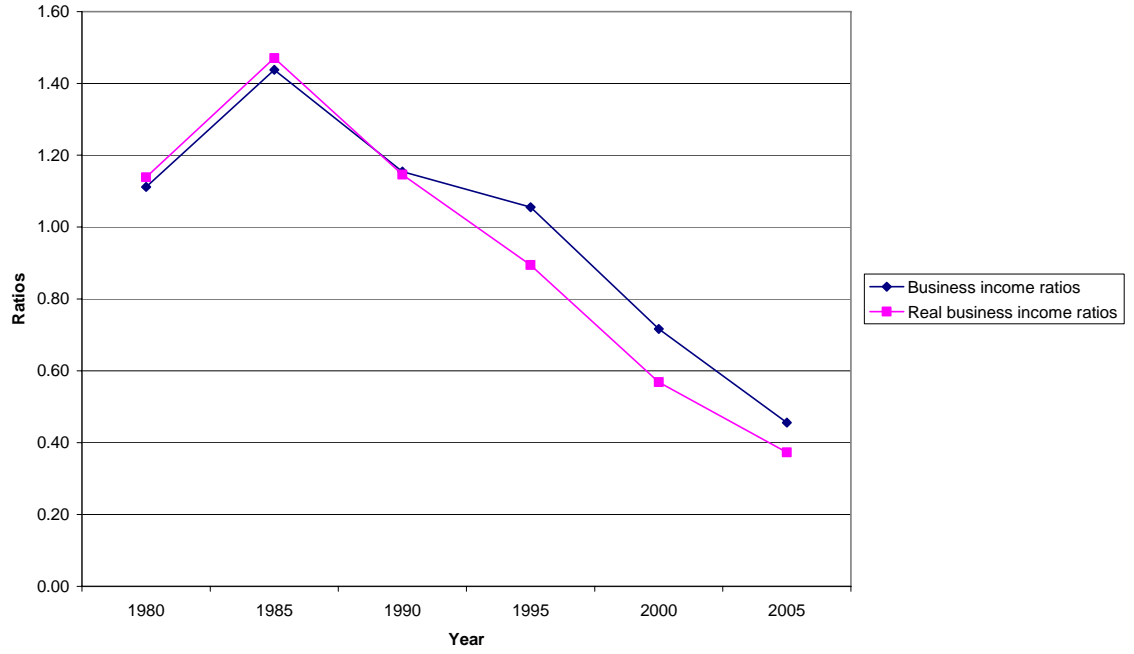


Figure 2 Business incomes in rural Shanghai, 1980-2005

**Panel (1) Per capita business income in rural areas: Ratios of Shanghai to the national average**



**Panel (2) Business/wage income ratios: National and Shanghai**

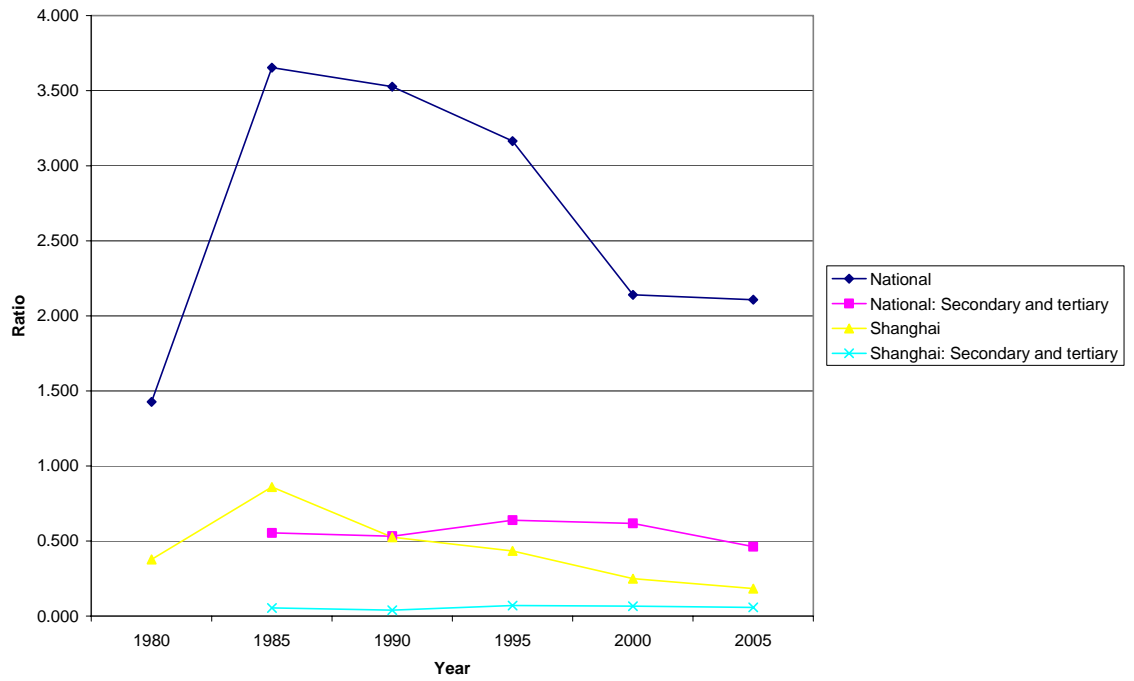
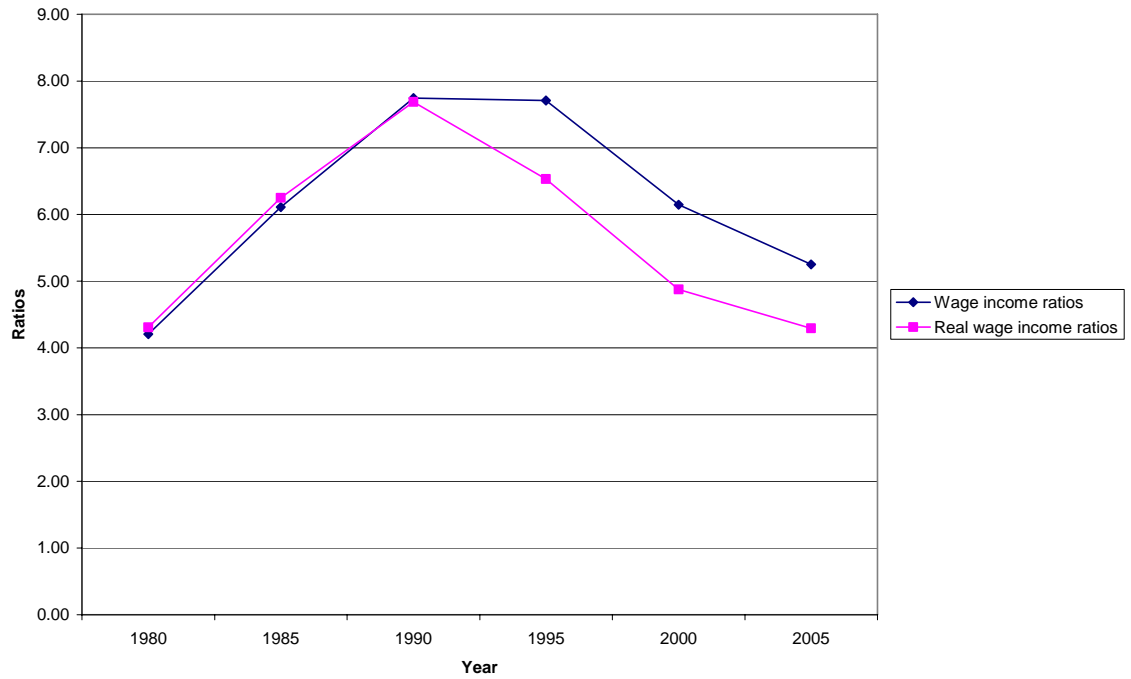


Figure 3 Rural per capita income in Shanghai, 1980-2005

Panel (1) Per capita wage income in rural areas: Ratios of Shanghai to national average



Panel (2) Rural per capita income: Ratios of Shanghai to the national average levels

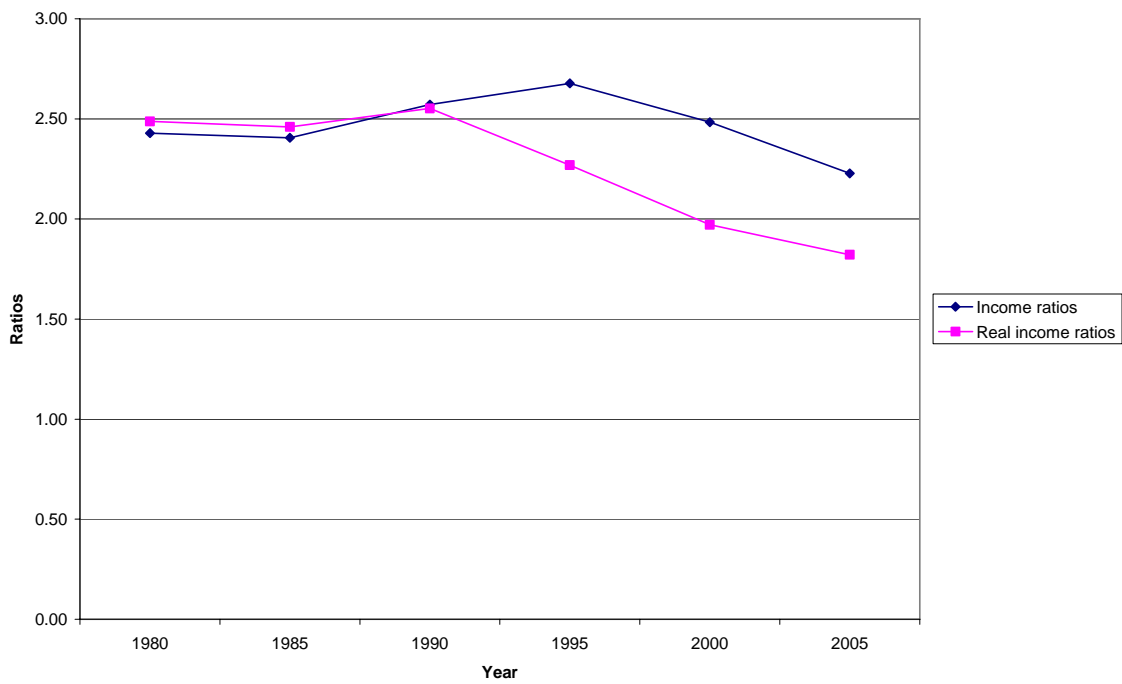
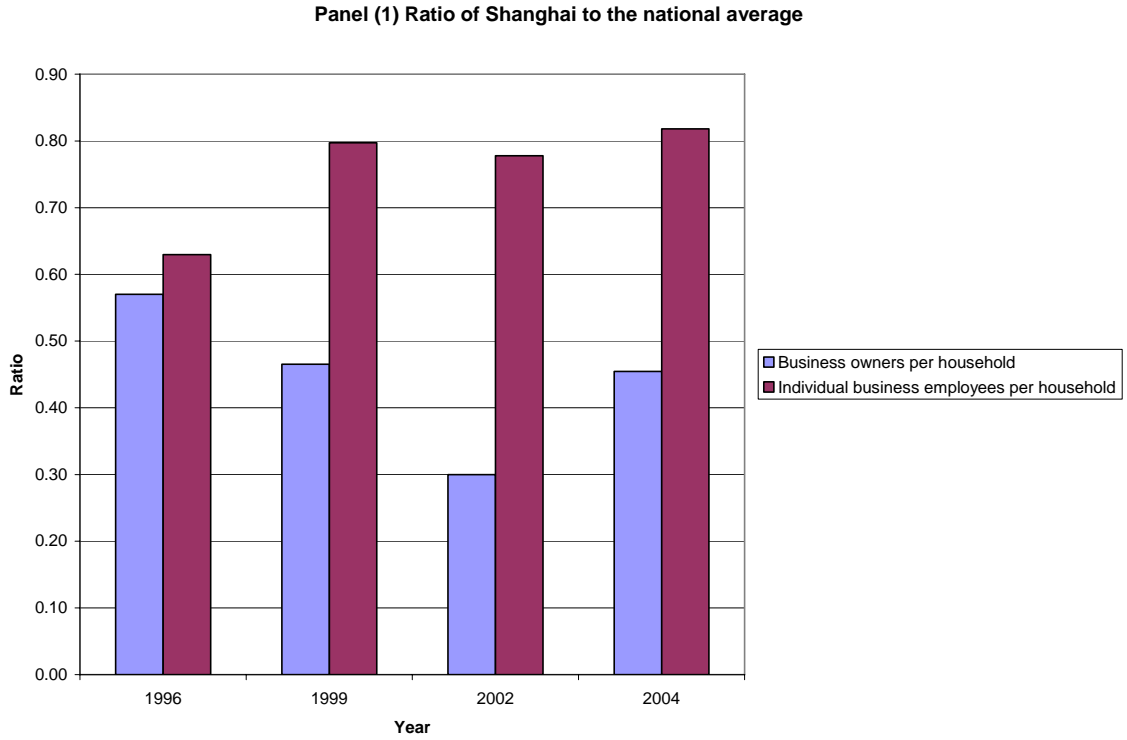
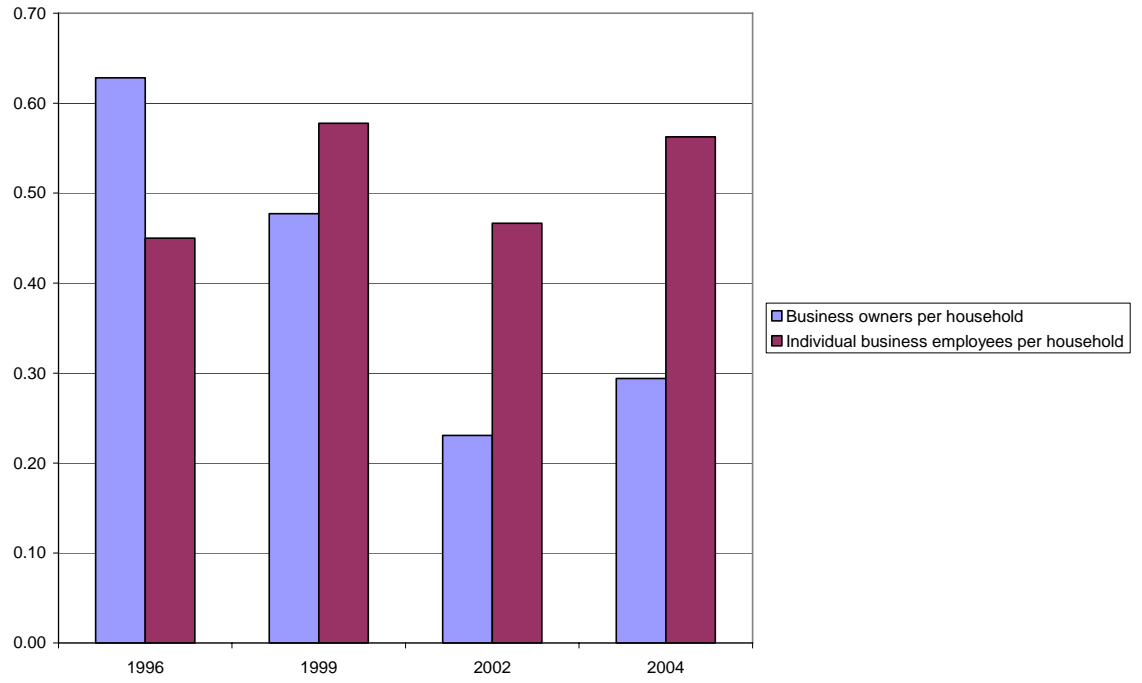


Figure 4 Individual business owners and employees (per household), Shanghai compared with others





Panel (2) Ratio of Shanghai to Zhejiang



Panel (3) Ratio of Shanghai to Yunnan

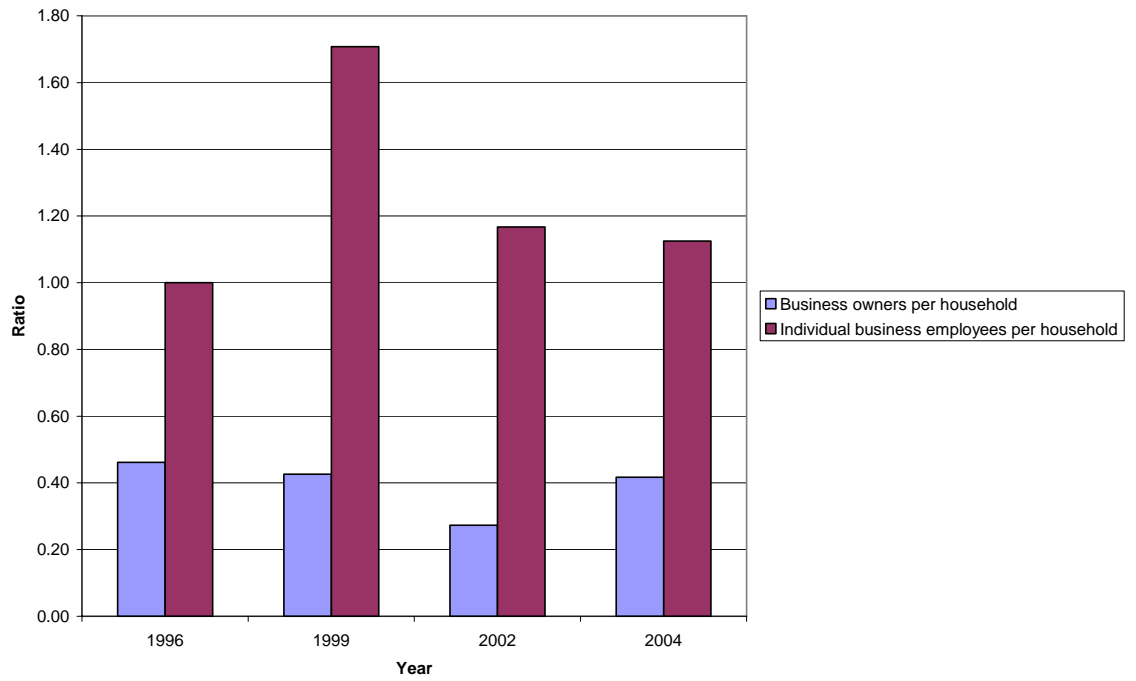
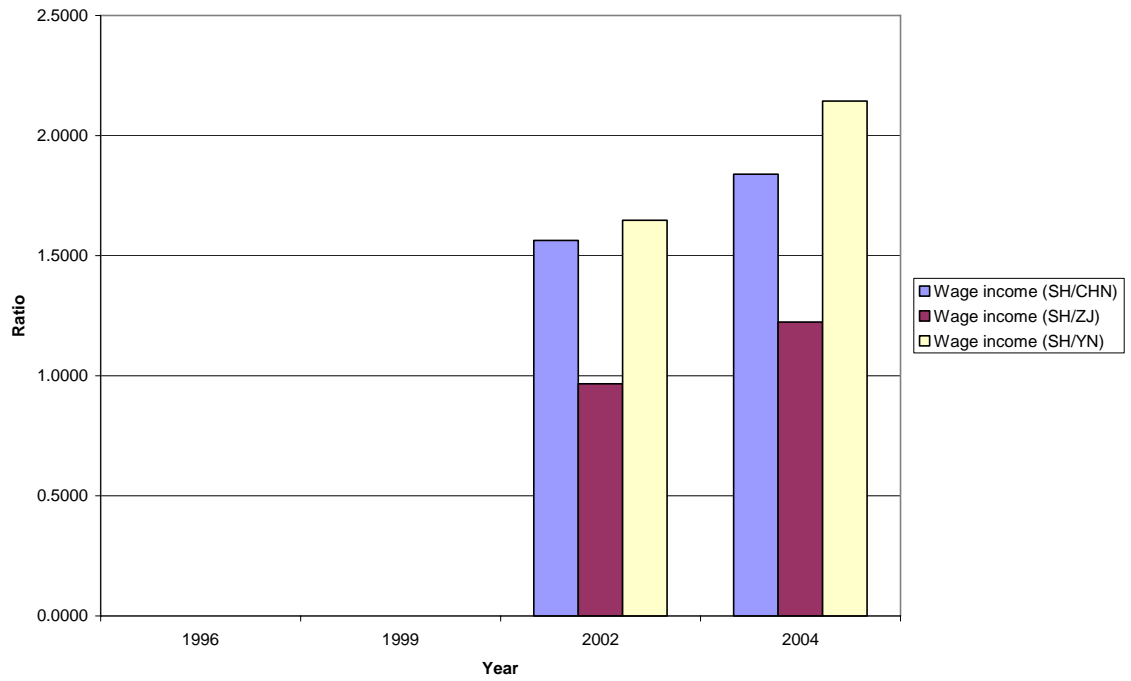


Figure 5 Returns on labor and on capital: Shanghai compared with others

Panel (1) Ratios of per capita wage income



Panel (2) Ratios of per capita business incomes

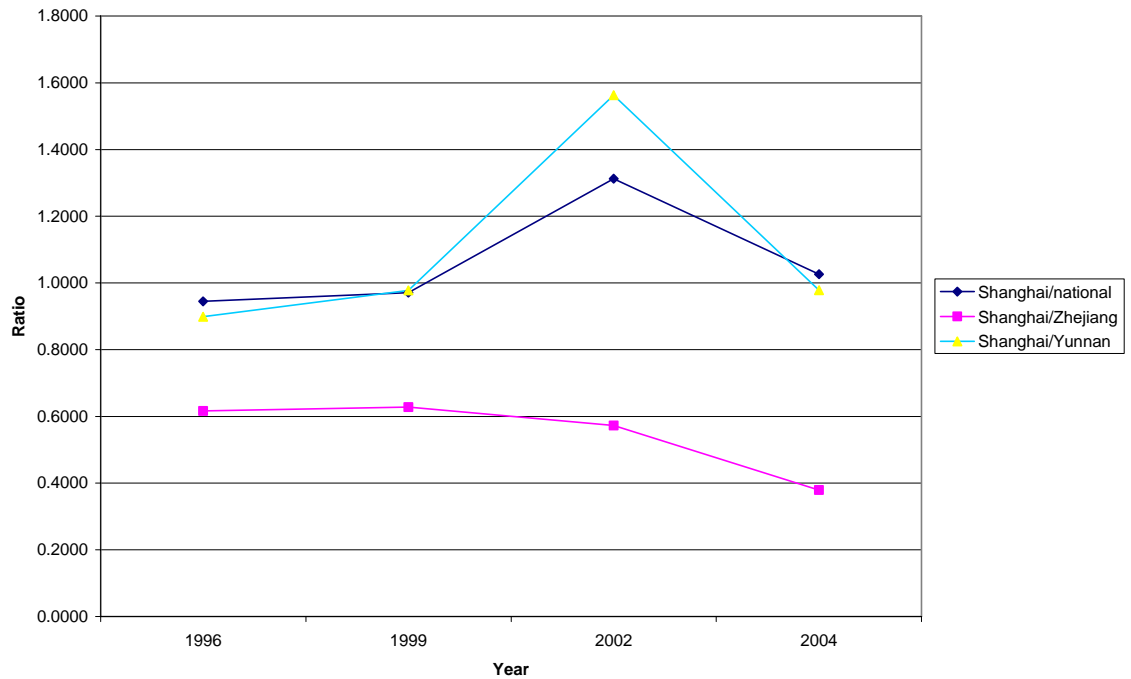
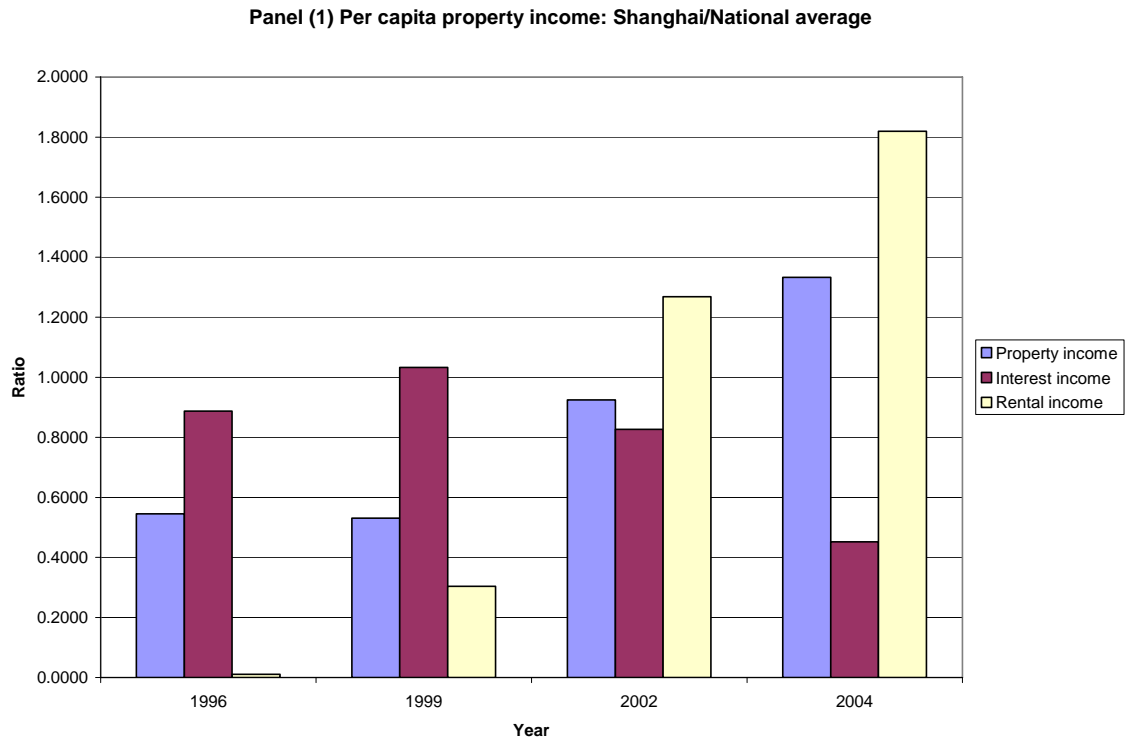


Figure 6 Property income comparisons



Panel (2) Per capita property income: Shanghai/Zhejiang

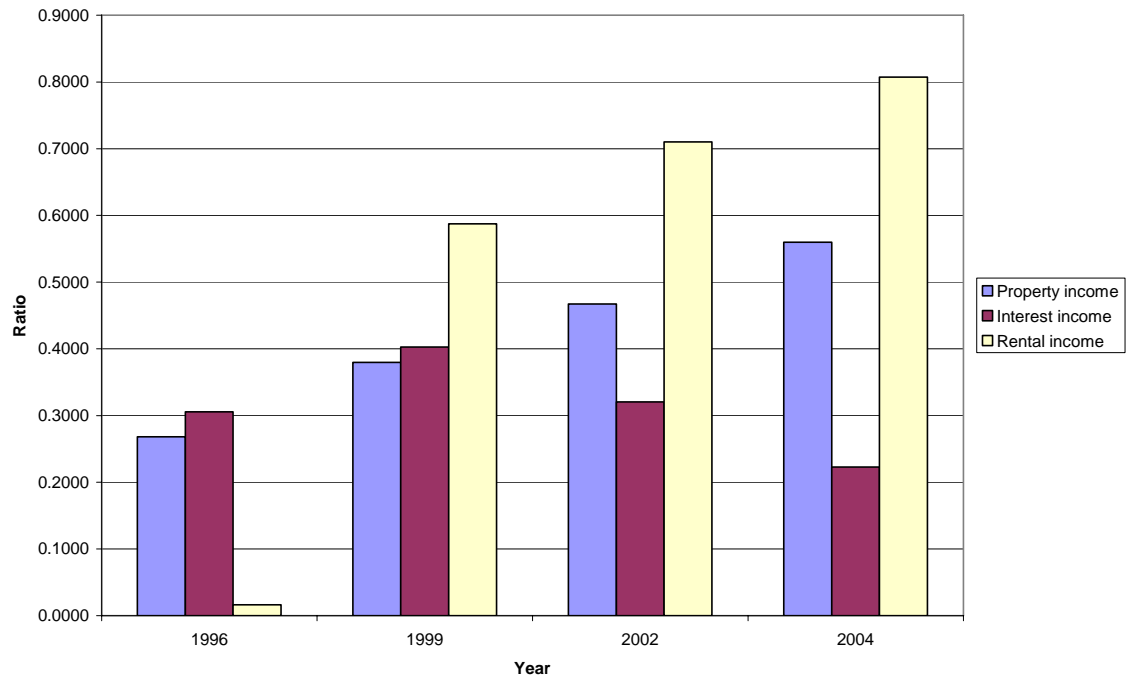
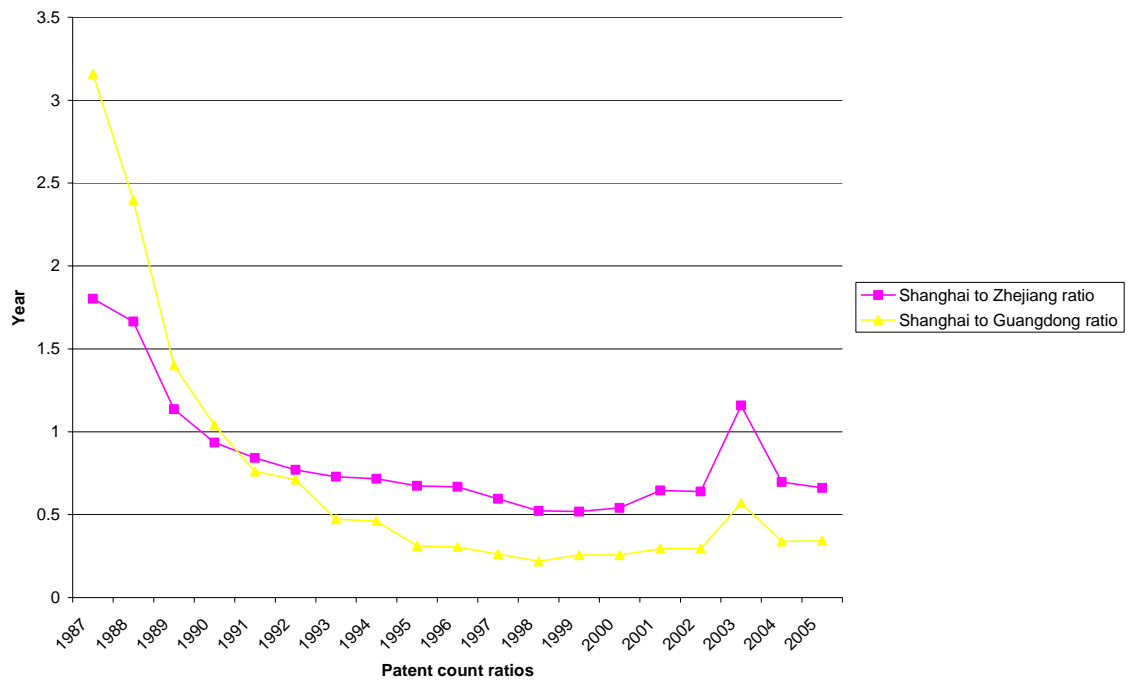
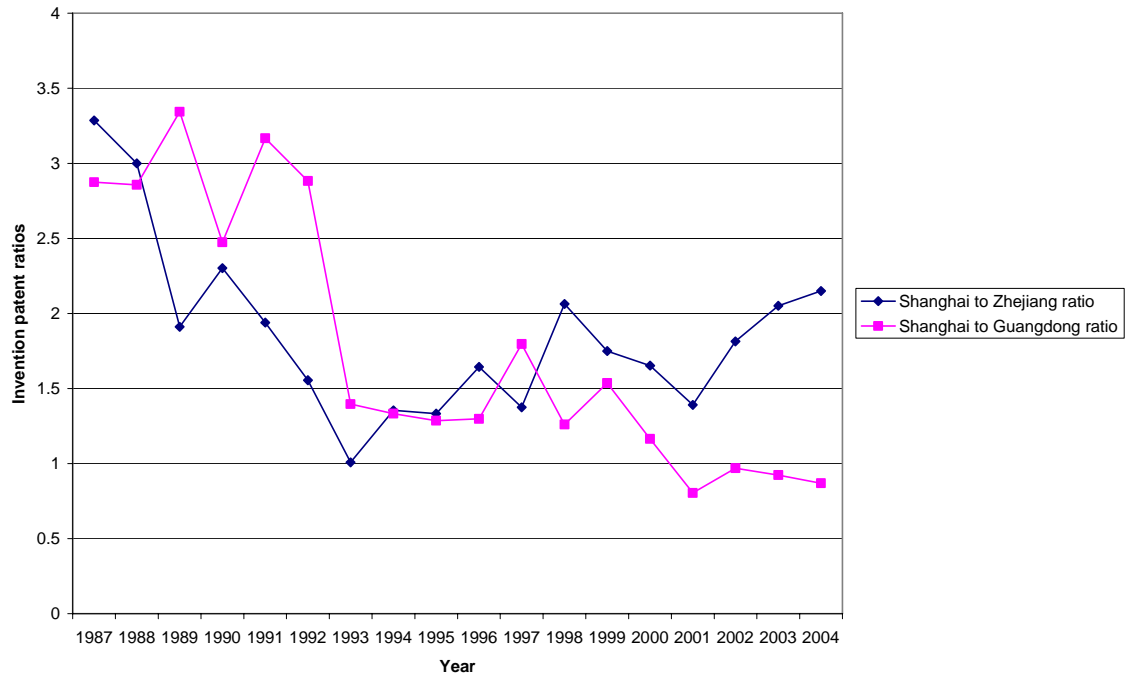


Figure 7 Patenting activities in Shanghai, Zhejiang, and Guangdong: A comparison

Panel (1) Patent count ratios: Shanghai/Zhejiang and Shanghai/Guangdong



Panel (2) Invention patent count ratios: Shanghai/Zhejiang and Shanghai/Guangdong



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