The Tale of Two Asian Tigers: Comparing Development in Selected Provinces of China and India since 1980[1]

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1 Introduction

The fast rates of economic growth of China and India over the past four decades are among the highest recorded in the history of mankind. They have been accompanied by increasing urbanization and industrialization, sharp reductions in poverty, illiteracy and improvements in many indicators of human development. It is notable that these achievements were broadly comparable despite marked differences in history, culture and political systems. Compared to India, China has a long history of a centralized and authoritarian state, and relatively low ethnic and religious fragmentation. Chinese society and politics continues to be dominated by the Chinese Communist Party (CCP), while control of the Indian government at the central and regional level is divided and frequently contested among rival political parties. However, the transition to fast growth in both countries was accompanied by a move towards a free market economy progressively integrated with the rest of the world through flows of trade and investment.

While there have been some debates regarding the accuracy of statistical data commonly used, it is broadly accepted that of the two countries, China has achieved faster rates of growth, urbanization, industrialization and poverty reduction. In this lecture I shall start with a detailed review of the key facts. I will then argue that part of the difference can be accounted by underlying differences in the role played by their respective states in the development process, which in turn stem from differences in underlying governance

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institutions. Given the vast heterogeneity within the two countries, I shall focus on specific provinces in the two countries which were broadly comparable in the 1970s in terms of population size, cropping patterns, occupational structure and standard of living: West Bengal (Figure 1) in India, and three provinces Anhui, Hunan and Jiangxi (Figure 2) in China. West Bengal occupies a middle rank among Indian states in per capita income, with levels and changes in economic indicators close to the Indian average. The Chinese provinces were chosen for their similarity to West Bengal in population, cropping patterns and per capita income in the late 1970s, besides achievng growth similar to the Chinese average.

There are also some similarities in political context: for much of the period since the late 1970s, the state government of West Bengal was controlled by the Left Front (LF), a coalition of Left parties led by the Marxist wing of the Communist Party of India (CPI-M) whose ideology was the closest among major Indian political parties to that of the CCP in China. The LF was elected to power in the 1977 state elections, roughly the same time that Deng Xiaoping emerged as the leader of the CCP. In both cases, these changes in political control were accompanied by a large land reform, a program of devolution of authority over economic decision making to local governments, and initiation of a market-based strategy of industrial growth. The Left Front held an absolute majority in the state legislature all the way from 1977 until 2011, and was dominated by the CPI-M which was a relatively disciplined party with a top-down hierarchy within the state. Of course there was an important difference in political context: the Left Front was exposed to political competition and ultimately lost the 2011 election to the TMC — an issue we shall return to later.

Section 2 presents indices of income, consumption, nightlights, poverty, inequality and various human development indicators in the selected provinces from the 1970s until 2015. We then review developments in the agricultural sector in Section 3, with land reforms boosting smallholder agriculture and increases in rice yields in the 1980s in both countries. The data also reveals a sustained difference in rice yields between the two countries. Section 4 reviews structural transformation and industrial growth performance of the two economies. The Chinese provinces achieved higher growth of urbanization, industrial pro-

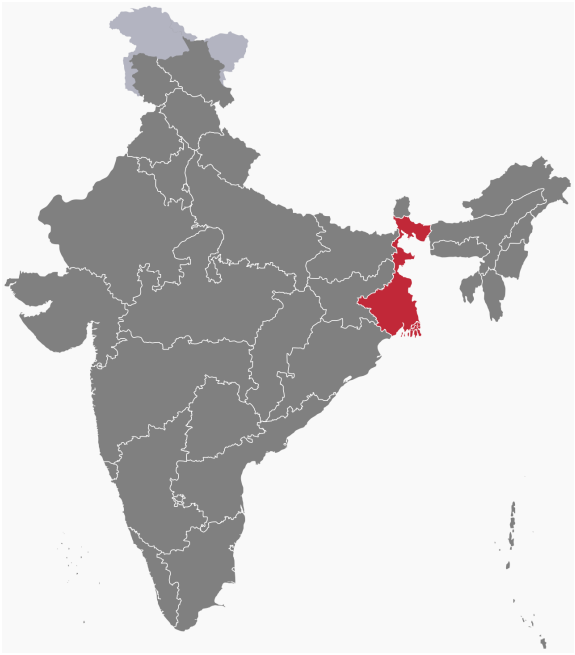


Figure 1: **West Bengal: Selected Province in India**

Figure 2: **Selected Provinces in China**

duction and manufacturing wages, particularly after 2000.

While there are potentially many different explanations for their comparative performance, I subsequently discuss the role of three areas of state policy are likely to have been important: R&D in hybrid rice, land acquisition for urbanization, and urban governance. Section 5 provides further details of each of these policy areas, based on available facts and the respective institutional environments in which these policies were formulated and implemented. This discussion suggests that the distinctive political institutions of the two countries had substantive implications for these policy differences. Besides highlighting these, our review of related research literature in these areas indicate a number of significant gaps in current knowledge, thus suggesting interesting directions for future research. Section 6 concludes with a summary, and reflection on broader implications for existing views on determinants of structural transformation in current macro-development literature.

2 Comparative Development: The Key Facts

2.1 Choice of Provinces

WB occupies middle rank among Indian states on most measures of development. Its growth experience is also representative of the overall all-India performance. Figure 3 plots per capita GDP in West Bengal (WB hereafter) and India respectively between 1980-2014. WB's income starts below the all-India average but catches up by 2005 after which the two figures are very close. Both WB and India show a marked acceleration in growth after 2005.

Moreover, urban and rural per capita consumer expenditure were remarkably similar both in levels and changes (Figure 4). Figure 5 plots poverty head count ratios (with thresholds based on household nutrition standards) and Gini coefficient of household consumption distribution. WB started with higher poverty (70%) than the all-India rate (55%) during the mid-1970s, but declined faster enabling WB poverty to converge to the all-India average rate of slightly under 30% by 1998. Consumption inequality in WB was the same (.3) as India in 1972, with a similar (slight) downward trend thereafter. Overall, both WB and India experienced a marked acceleration in GDP per capita, large drop in poverty and

Figure 3: **Per capita GDP: India and West Bengal**

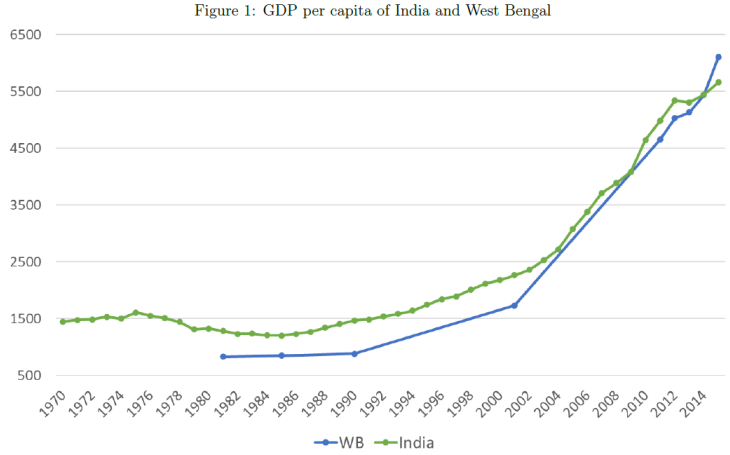
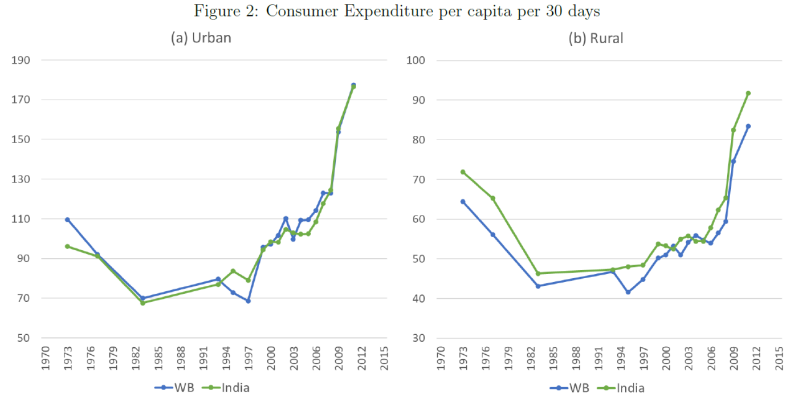


Figure 4: **Per capita consumption: India and West Bengal**



slight decline in inequality.

The three provinces of China were chosen on the basis of two criteria: representativeness of China's growth experience, and similarity to WB with regard to population and cropping patterns in the early 1980s. With regard to the former criterion, Figure 6 shows these provinces occupied a below median rank within China with regard to 1981 GDP per capita, and in this respect were closer to WB compared with the median Chinese province. Figure 7 shows they were similar to the rest of China in levels of rural consumption, while lagging behind in urban consumption. With regard to growth rates of GDP per capita and consumption, the experience of these provinces were representative of China as a whole. Turning to the second criterion, Table 1 shows rice was the dominant crop in WB, Hunan and Jiangxi accounting for approximately 60% of cropped area, whereas wheat was the

Figure 5: **Poverty and Inequality: India and West Bengal**

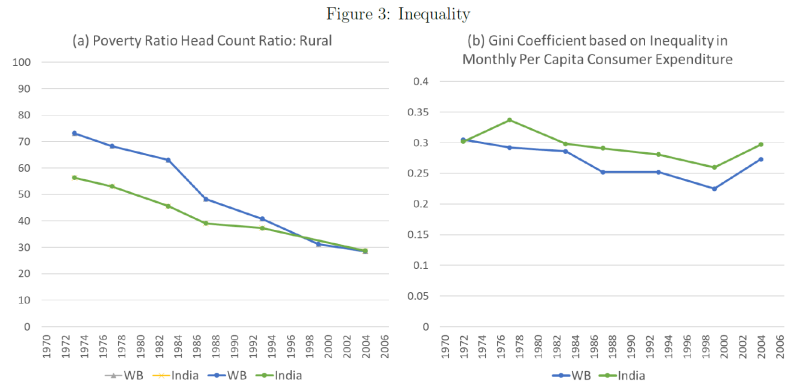
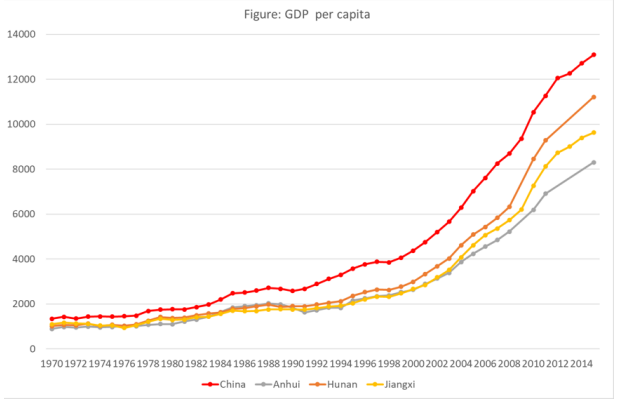


Figure 6: **Per capita GDP: China and Selected Provinces**



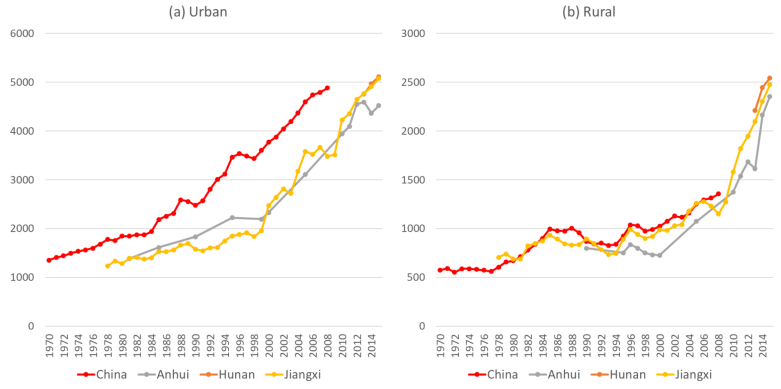
main crop in Anhui. Anhui, Hunan and WB had populations near or slightly above 50 million in 1981, while Jiangxi's population was 33 million.

2.2 Trends in Living Standards, Inequality and Human Development

I start by comparing trends in key indicators of development between WB and the Chinese provinces. Figure 8 shows GDP per capita levels were approximately 50% higher throughout in the Chinese provinces. Table 2 confirms that their per capita GDP growth experiences were similar: annual growth rates over 1981-2015 were identical (6.05%) in WB and Jiangxi, slightly higher (6.3%) in Hunan and slightly lower in Anhui (5.8%). In both countries growth rates nearly doubled after 2001.

Consumption per capita however shows a different picture. Figure 9 presents corresponding comparisons of per capita consumption expenditure between WB and the two

Figure 7: **Per capita Consumption: China and Selected Provinces**



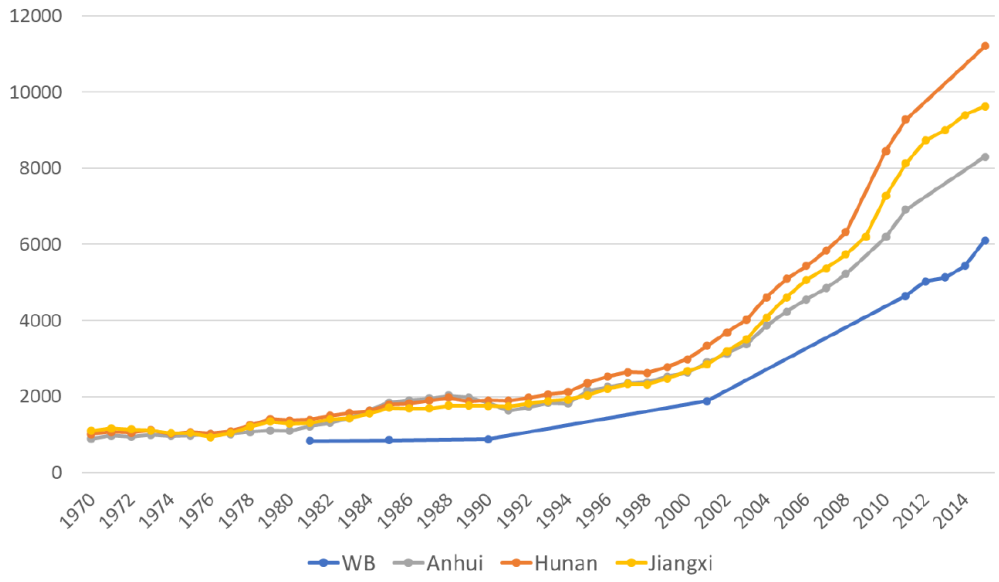
Notes: These figures show the time-series of urban and rural consumer expenditure per capita per 30 days in 2017 US dollars after PPP adjustment. Data are taken from provincial yearbooks, and China Compendium of Statistics 1949-2008. PPP adjustment index data is from the Penn World Table.

Table 1: **West Bengal and Chinese provinces: Comparison in 1980s**

	Year	West Bengal	Anhui	Hunan	Jiangxi
GDP per capita	1981	832	1225	1395	1306
National Rank (GDP p.c.)	1981	7/15	26/31	21/31	22/31
Population	1981	55	50	53	33
Share of Rice in Cropped Area	1985	63	26	58	60

Notes: GDP per capita in 2017 US dollars after PPP adjustment. Unit of population is million. For West Bengal, GDP per capita is taken from the Bureau of Applied Economics & Statistics, Govt of WB; GDP per capita rank is taken from CSO; population and population density are taken from Census; rice share is taken from Directorate of Agriculture, GoWB. For Anhui, Hunan, and Jiangxi, GDP per capita from China Compendium of Statistics 1949-2012; population from provincial yearbooks; rice share from Ministry of Agriculture of the PRC (2009).

Figure 8: **GDP per capita: WB and Chinese Provinces**



Chinese provinces for which we have the data (for Hunan it is missing for all but the last few years). It is remarkable that consumption levels were almost the same in WB and the Chinese provinces in 1978, when the reform process was initiated. However, consumption grew faster in the Chinese provinces, resulting in a significant divergence: in 2012 living standards were more than twice as high in China. This is partly accounted by a relative stagnation in WB until the late 1990s. In both countries we see an acceleration in growth from 2000 onwards. After 1999, Table 2 shows both rural and urban consumption grew considerably faster in the rice growing province of Jiangxi compared with WB.

The discrepancy in the growth comparisons between output and consumption data is somewhat puzzling, but the two sets of data are collected in different ways and many earlier authors have noted similar discrepancies (e.g., Deaton (?), Ravallion (?)). Other possible explanations may lie in differences in saving behavior or in inequality, though these seem somewhat unlikely.

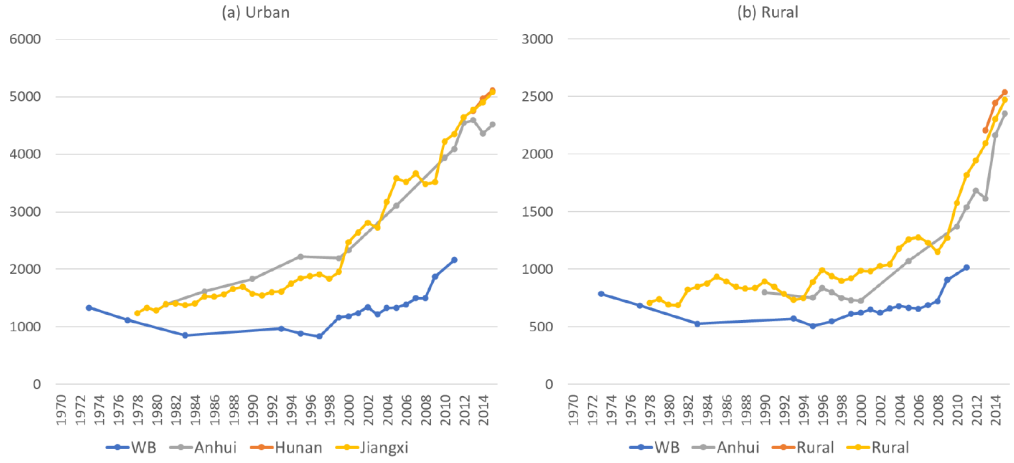
Next, trends in poverty and inequality are compared in Figure 10. Here data is not available at the province level within China, so we compare WB with China as a whole. The poverty line in China was 2300 yuan per year at 2010 prices, which translated into $2.12 per day in 2015 prices after PPP adjustment. In India, the PPP equivalent threshold

Table 2: **Growth Rate Comparisons**

(a) GDP per capita			
	1981-2015	1981-2001	2001-2015
WB	6.04	4.18	8.74
Anhui	5.79	4.39	7.81
Hunan	6.32	4.45	9.04
Jiangxi	6.05	3.97	9.10
(b) urban consumption expenditure per capita			
	1980-2011	1980-1999	1999-2011
WB	3.38	1.97	5.28
Anhui	3.67	2.58	5.34
Jiangxi	4.02	2.25	6.89
(c) rural consumption expenditure per capita			
	1980-2011	1980-1999	1999-2011
WB	2.39	0.96	4.32
Anhui	3.18	-0.96	6.39
Jiangxi	3.17	1.52	5.83

Notes: GDP per capita (in 2017 US PPP adjusted dollars). Anhui's growth rate is calculated for 1990-2011, 1990-1999 in the first 2 columns of Table (b) and (c) due to data limitations. For WB, GDP per capita source: Bureau of Applied Economics & Statistics, Government of West Bengal; consumption source: NSSO,Planning Commission. Data source for Chinese provinces: China Compendium of Statistics 1949-2008, provincial statistical yearbooks.

Figure 9: **Consumption per capita: WB and Chinese Provinces**



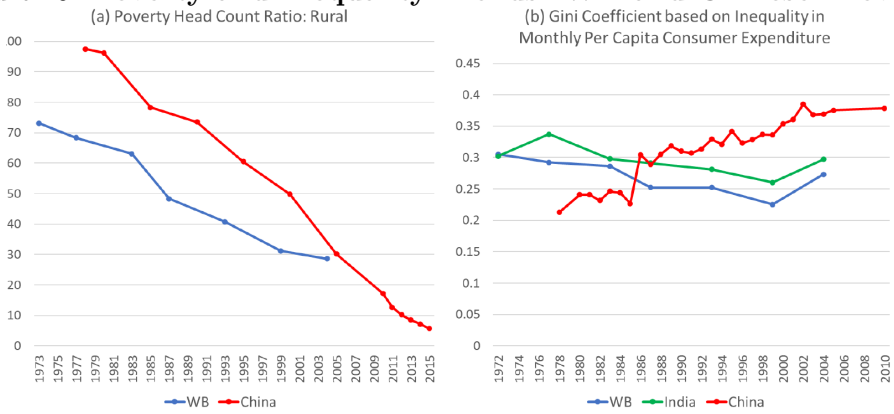
declined from $2.26 in 1973 to $1.51 in 2004. These differences make it difficult to compare poverty across the two countries. The lowering of the poverty line over time in India implies that trend comparisons are also difficult. Based on their respective poverty lines, poverty declined faster in China, while India also achieved a substantial reduction. The falling poverty line however implies the downward trend in India is larger than would have been with a stationary poverty line. Hence the evidence suggests a more significant reduction in poverty in China.

On the other hand inequality of consumption nearly doubled in China, while it declined slightly in both WB and India.

With regard to levels of various human development indicators, the Chinese provinces consistently outperform WB. WB has substantially higher birth and death rates at the beginning, but these had converged to Chinese levels by 2014. Life expectancy rose in both countries, with a faster rise in WB which helped narrow the gap with China. Infant mortality and illiteracy in both countries fell markedly, and the gaps in these did not narrow. WB initially had a substantially lower female/male gender ratio at birth, but it rose faster, eventually surpassing all three Chinese provinces by 2010.

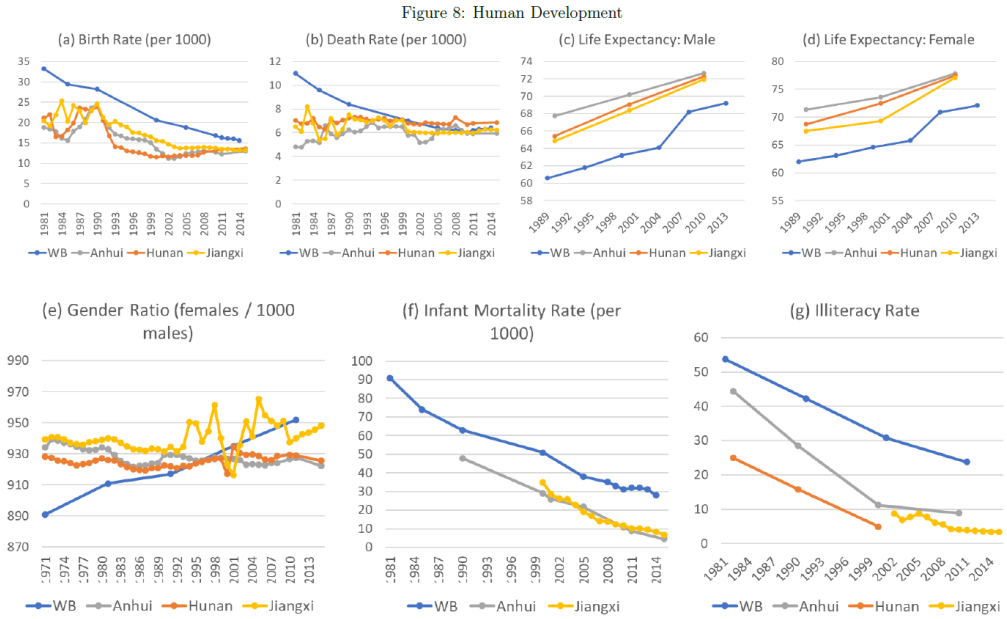
In summary, the two countries achieved similar growth in output over the entire period 1980-2015, while consumption grew faster in China. In both countries growth accelerated markedly after 2000. Standards of living diverged progressively, both in rural and urban

Figure 10: **Poverty and Inequality Trends: WB and Chinese Provinces**



areas. China also achieved faster reduction in poverty but experienced a rise in inequality unlike India. Human development levels were consistently higher in China, while WB achieved greater improvements in some dimensions (mortality, fertility and gender ratio) and similar improvements in others (health and literacy).

Figure 11: **Human Development Comparisons: WB and Chinese Provinces**



3 Agricultural Performance

Starting from 1978-79 both WB and China embarked on ambitious programs of land reform and agricultural development. The transformation in China is described bu Huang (2018). 1978 Chinese agriculture was organized in communes, and characterized by compulsory grain procurement by the government to sustain the industrial sector, which resulted in massive rural poverty. Following 1978, the reform created a new Household Responsibility System (HRS) where land was leased to individual households who were empowered to produce on their own. Grain procurement levels were lowered, with households allowed to retain residual output above the required delivery target to the government. Procurement prices were also raised. Agricultural markets came into being where households were allowed to sell. These reforms led to significant growth in agricultural output and rural household consumption. McMillan et al (1989) report a 61% increase in output between 1978-84, partly explained by increased agricultural labor force, capital and other material inputs, and TFP growth (which varied between 4-10% per year). They estimate 78% of the associated gains in productivity could be attributed to the changes in farmer effort incentives (measured by share in own-output which increased by a factor of three times),

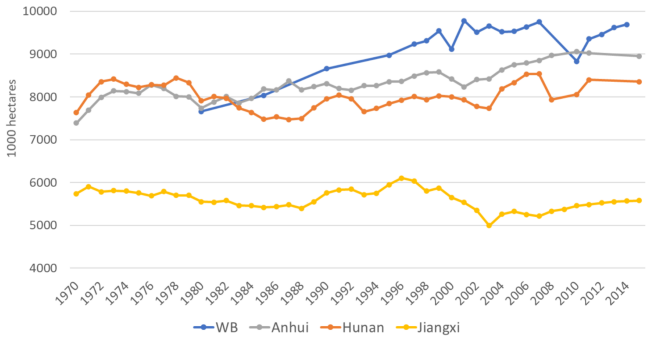
after controlling for changes in output prices.

In WB the new LF government also initiated a large program of land reform and devolution of local agricultural development to elected local governments (described further in Banerjee et al (2002) and Bardhan and Mookherjee (2010, 2011)). The land reform consisted of two components: distribution of titles (*pattas*) to small plots of land acquired in the past from households owning more than the mandated land ceilings, and registration of tenant farmers providing them security of tenure and a minimum crop share (*Operation Barga*). Between 1978-98, the *patta* distribution program expanded from 1.4 to 5.4% of cultivable area, with coverage of rural households expanding from 5 to 15%. The corresponding coverage of Operation Barga expanded from 2.4 to 6.1% of cultivable area, and 3 to 4% of rural households. The two programs combined thus affected nearly 10% of area and 20% of rural households by the late 1990s. Bardhan and Mookherjee (2011, Table 5) estimate value added per farm doubled between 1982 and 1995, accounted partly by a 70% rise in cropped area, a five times rise of value added per acre in rice cultivation (owing to a rise in rice area under high yielding varieties (HYV) from 6 to 67%).

However, the program in WB was accompanied by a reform in the delivery mechanism of agricultural inputs and complementary rural infrastructure. From 1978 onwards, a three tier system of directly elected local governments was created; the state government shifted responsibility to these elected local officials (away from state bureaucrats in line ministries) for selecting beneficiaries of subsidized agricultural 'minikits' containing seeds and fertilizers, subsidized credit, employment programs and construction of local infrastructure (roads and irrigation projects). Bardhan and Mookherjee (2011, Table 11) provide evidence that most of the rise in farm value added per acre between 1982-95 was accounted by the delivery of minikits and credit by local governments, while the contribution of the land reform program was negligible and restricted to the pre-1985 period. However the land reforms contributed in other ways: by inducing expansions in cropped area (Bardhan and Mookherjee 2011, Table 12) and stimulating private investment in minor and medium irrigation (Bardhan, Mookherjee and Kumar 2012).

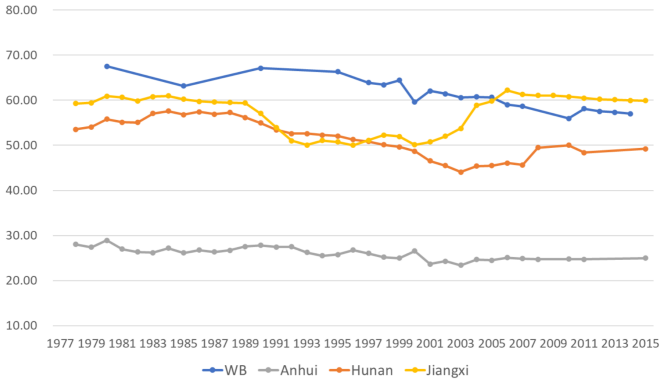
We now examine differences between WB and the selected Chinese provinces with regard to different components of agricultural performance. Figure 12 shows absence of any

Figure 12: **Cropped Areas: WB and Chinese Provinces**



Source: Data of West Bengal are taken from Directorate of Agriculture, Evaluation Wing, GoWB; data of Anhui, Hunan, and Jiangxi are taken from the China Compendium of Statistics 1949-2008 and provincial statistical yearbooks.

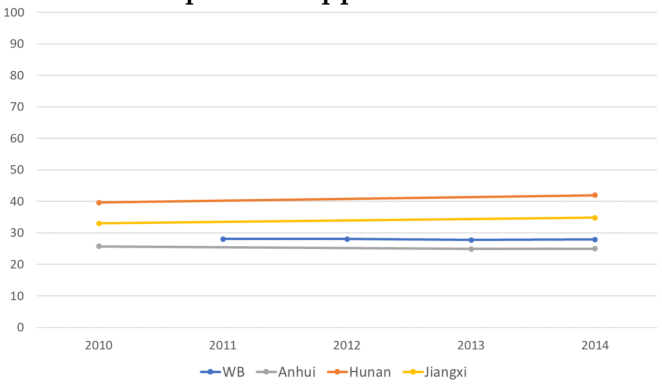
Figure 13: **Share of Rice in Cropped Area: WB and Chinese Provinces**



Source: Data of West Bengal are taken from Directorate of Agriculture, Evaluation Wing, GoWB; data of Anhui, Hunan, and Jiangxi are taken from the Ministry of Agriculture of the PRC (2009) and provincial statistical yearbooks.

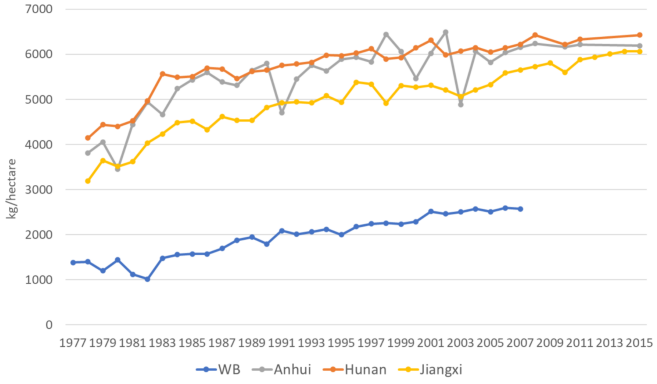
significant changes in cropped area in the Chinese provinces, in contrast to a modest upward trend in WB. Figures 13, 14 show no change in cropping patterns in either country. Figure 15 shows a very marked difference in rice yields, which are at least two times as high in China. Both countries display some growth in rice yields, but the trends are parallel. This indicates a significantly superior level of productivity in Chinese agriculture. To probe possible underlying differences in rice yields, Figures 16, 17 compare fertlilizer and irrigation inputs. Fertilizer application was throughout lower in WB and grew at the same rate as in the Chinese provinces, while irrigation grew faster in WB. Hence differences in fertilizer may account for some of the difference in rice yields. In the next section we shall argue that differences in R&D played an important role.

Figure 14: **Share of Cash Crops in Cropped Area: WB and Chinese Provinces**



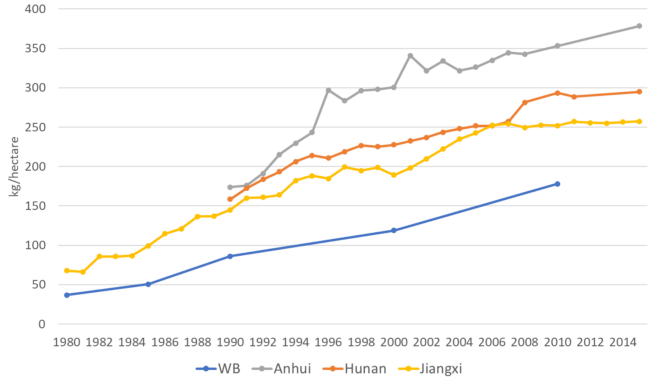
Notes: The 8 cash crops are: Oilseeds, Jute, Fruits, Vegetables, Tea, Sugarcane, Tobacco, and Cotton. Data on West Bengal are taken from Directorate of Agriculture, GoWB; data on Anhui, Hunan, and Jiangxi are taken from Ministry of Agriculture of the PRC (2009) and provincial statistical yearbooks.

Figure 15: **Rice Yield: WB and Chinese Provinces**



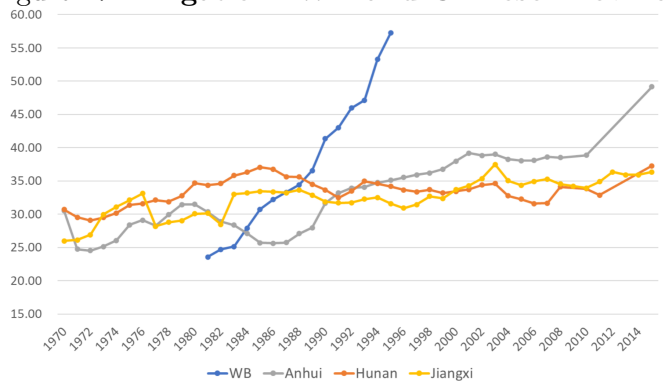
Source: Data of West Bengal are taken from Directorate of Agriculture, Evaluation Wing, GoWB; data of Anhui, Hunan, and Jiangxi are taken from the Ministry of Agriculture of the PRC (2009) and provincial statistical yearbooks.

Figure 16: **Fertilizer Application: WB and Chinese Provinces**



Source: Data of West Bengal are taken from Directorate of Agriculture, Evaluation Wing, GoWB; data of Anhui, Hunan, and Jiangxi are taken from the Ministry of Agriculture of the PRC (2009) and provincial statistical yearbooks.

Figure 17: **Irrigation: WB and Chinese Provinces**



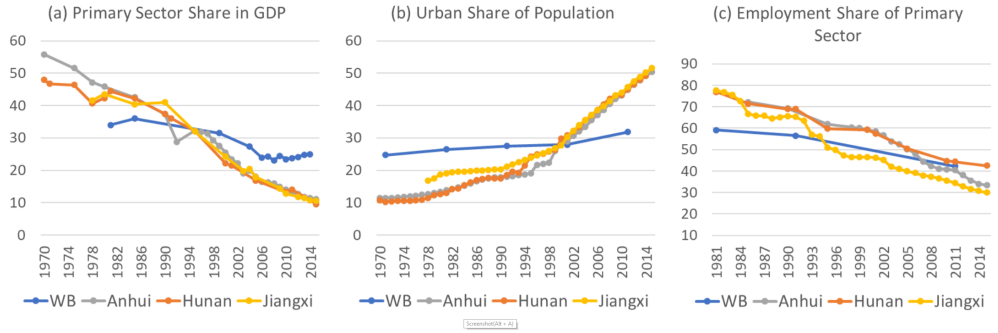
Source: Data of West Bengal are clculated based on Bardhan et al. (JDE2012); data of Anhui, Hunan, and Jiangxi are taken from China Compendium of Statistics 1949-2008 and provincial statistical yearbooks.

4 Structural Transformation: Urbanization and Industrialization

In this section we compare trends in structural transformation and industrial growth. Figure 18 shows a faster drop in the share of the primary sector both in GDP and employment compared with WB. The difference in growth in urbanization is particularly striking: in China the urban share of population rose from 10% to 50% between 1970-2014, compared to an increase from 25 to 31% in WB. Urbanization rates are not comparable across the two countries owing to different definitions, with India using a more restrictive definition that excludes a large number of 'census towns' that are classified as urban in the Census but not recognized by the state government. However, trends in urbanization are likely to be more comparable across the two countries, though it is possible that these measured trends are an underestimate in India if 'census towns' keep growing

Given the large differences in productivity and consumption standards between rural and urban areas, an increase in urbanization tends to raise per capita output and consumption. This is why growth in urbanization tends to play an important role in driving growth in developing countries. Indeed, given the striking difference in growth of urbanization between the two countries, one may have expected China to achieved a substantially higher aggregate growth rate than India. Part of this puzzle may perhaps be explained by underestimation of growth of urbanization in India on account of ignoring growth of 'census

Figure 18: **Structural Transformation and Urbanization: WB and Chinese Provinces**



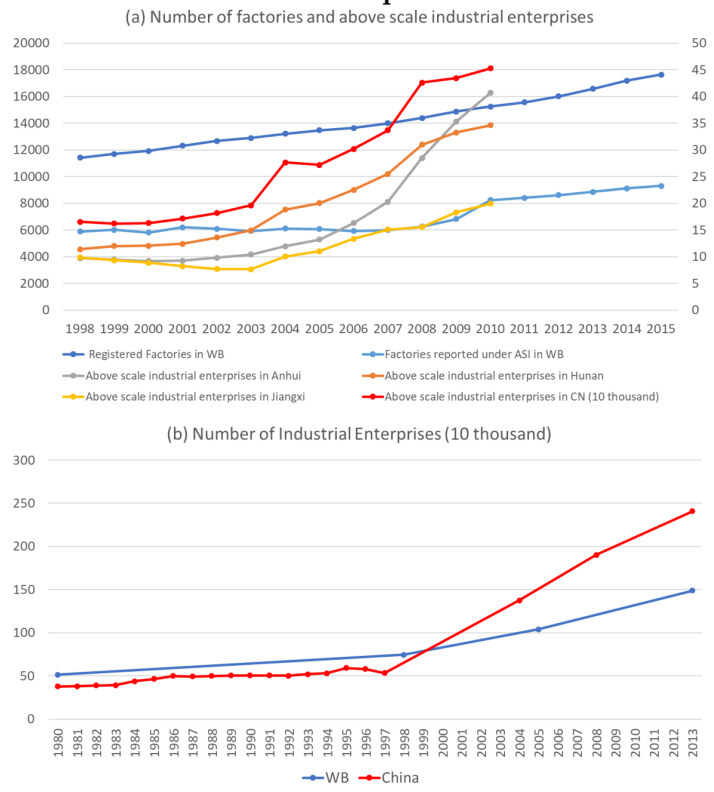
Notes: For primary sector share in GDP, data for West Bengal includes mining, but data for the Chinese provinces do not include mining; data between 2002 and 2012 includes agricultural service for the Chinese provinces. For employment share, data for West Bengal includes mining, but data for Anhui only includes mining after 1995, data for Hunan only includes mining after 2005, and data for Jiangxi never includes mining. For West Bengal, primary sector share in GDP are taken from Bureau of Applied Economics & Statistics, Government of West Bengal, and data on urban share and employment share are taken from the Census. For Anhui, Hunan, and Jiangxi, data were all taken from the China Compendium of Statistics 1949-2008 and provincial statistical yearbooks.

towns'. It is also possible that the gap between rural and urban productivity in India is larger than in China, consistent with evidence on rural-urban wage gaps: 47% in India in 2007 as against 10% in China in 2006 (Munshi and Rosenzweig (2016)).

Urbanization tends to be driven by industrial growth associated with rise in manufacturing and services. Figure 19 shows trends in the number of industrial enterprises. Panel (a) pertains to registered factories in WB and above-scale industrial enterprises in China as a whole and the three provinces, while panel (b) presents data for all industrial enterprises both registered and unregistered (from the Economic Censuses) in WB and China respectively. In both panels we see a faster increase in the number of enterprises in China, particularly after the late 1990s. Figure 20 presents data on employment in registered or above scale factories after 1999, which shows a similar pattern. And Figure 21 shows earnings of factory workers in China and in Anhui grew faster than in WB after the 1990s. In all these respects, the industrial sector was considerably more dynamic in China. Admittedly the choice of WB understates industrial progress compared to the rest of India, as shown in Amirapu and Subramanium (2015).[3] However there is no doubt that China achieved much greater structural transformation and growth in manufacturing than India.

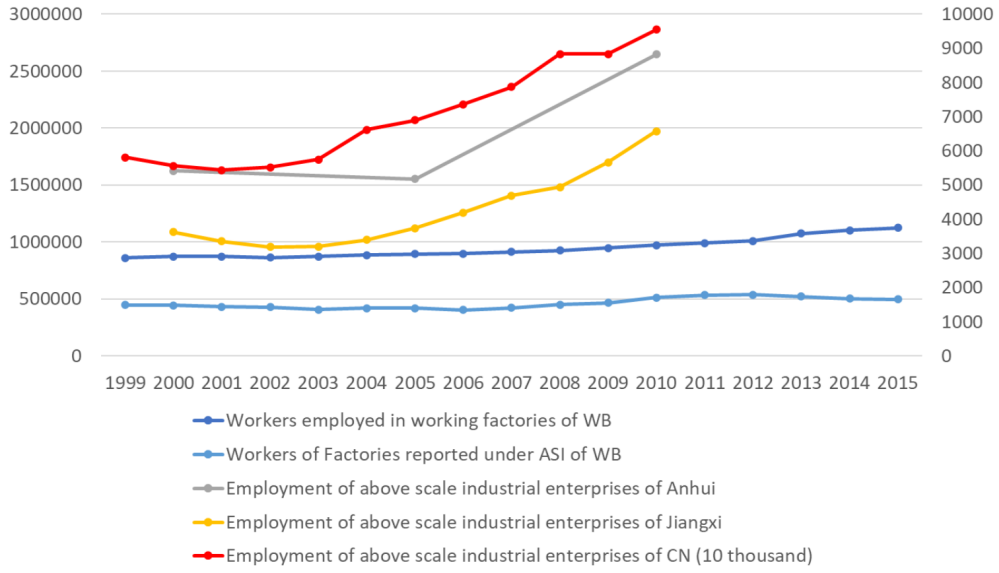
[3]See their Figures VI-VIII which shows a decline in output and employment share of registered manufacturing in WB in contrast to a flat profile for India as a whole.

Figure 19: **Number of Industrial Enterprises: WB and Chinese Provinces**



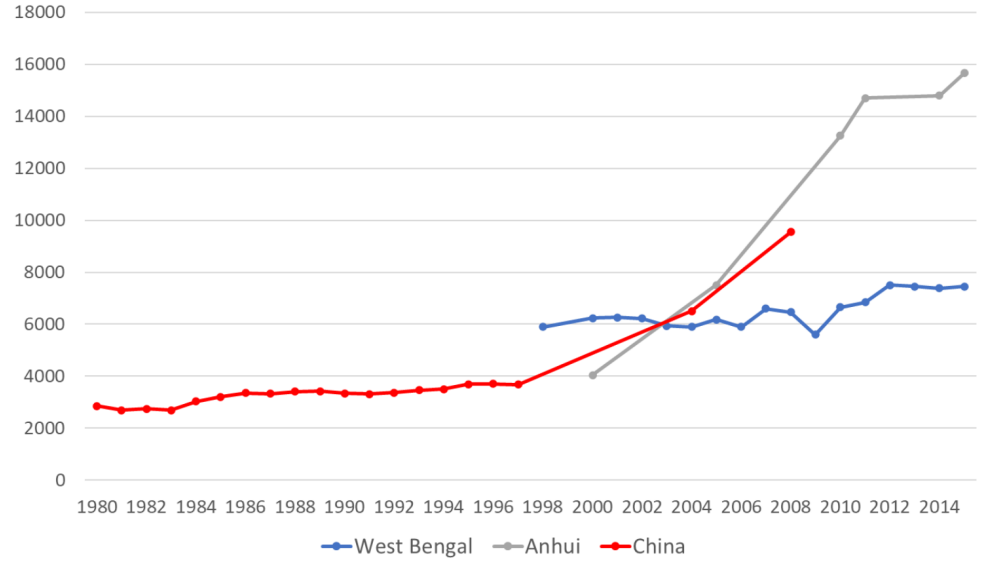
Notes: The right y-axis is for the number in China; others use the left y-axis. For CN, Hunan, and Anhui, the definition for "above scale" in 1998-2006 and 2007-2010 are slightly different. The definitions of "industrial enterprises" are different between India and China so the values are not comparable. But the trends are comparable. Number of Registered Factories of WB are drawn from Chief Inspector of Factories, Government of WB; number of factories reported under ASI of WB are drawn from ASI summary results; number in Anhui, Jiangxi, and Hunan are drawn from China National Bureau of Statistics and the provincial statistical yearbooks; number in China are drawn from China Industrial Economic Statistical Yearbook. Number of enterprises in WB are from Economic Census; number for China are from Industrial Economic Statistical Yearbook and China Economic Census Yearbook

Figure 20: **Factory Employment: WB and Chinese Provinces**



Notes: Right y-axis is for number in CN with unit 10 thousand; others use the left y-axis. Number of workers employed in working factories of WB are drawn from Chief Inspector of Factories, Government of West Bengal; number of workers of factories reported under ASI of WB are drawn from Annual Survey Of Industries summary results; employment in Anhui and Jiangxi are drawn from China National Bureau of Statistics and the provincial statistical yearbooks; employment in China are drawn from China Industrial Economic Statistical Yearbook.

Figure 21: **Earnings of Factory Workers: WB and Chinese Provinces**



Notes: This figure shows the time-series of earnings of factory workers of AIS in West Bengal, average wages of workers in industrial enterprises in China, and wages of workers in above scale industrial enterprises in Anhui. The earnings are in 2017 US dollars after PPP adjustment. Data for West Bengal are taken form the ASI reports; data for China are from the China Economic Census Yearbook; data for Anhui are from Anhui statistical yearbook. PPP adjustment index data is from the Penn World Table.

5 Underlying Policy Differences

In this section we describe a number of specific government policies that likely played an important role in explaining differences in outcomes reviewed in previous sections.

5.1 Hybrid Rice Development

We saw the large difference in rice yields between the two countries, and that part of this could possibly be accounted by higher application of fertilizers in China. Another important cause was the faster progress made by China in developing new hybrid varieties of rice. Yu (2012) estimates that 74% of the rise in rice yields between 1980-2009 was accounted by adoption of superior rice varieties, while changes in climate and in application of nitrogen fertilizers accounted for 4.4% and 9.3% respectively. Song et al (2014) estimate the role of improved rice varieties to have been 62% which is lower than Yu's estimate but still accounts for the bulk of the rise in yields.

Hybrid rice varieties owe their origin to scientific discoveries made in China during the mid-1960s, particularly by Yuan Longping widely recognized as the 'father of hybrid rice' who continued to be active in R&D for the next forty years. In contrast to 'in-bred' HYV rice that was being adopted in India and many other Asian countries during the Green Revolution, hybrid rice involves 'heterosis' or cross-breeding of two different varieties, involving genetic transfer of male sterility genes from wild rice to create a male sterile line for cross-pollination. Though it involves some genetic manipulation, hybrid rice differs from GMO rice because it relies on a natural pollination process rather than being created in a laboratory via gene splicing. In the first phase, the research advances led to 43 different varieties of hybrid rice in China, which began to be planted from the mid-1970s onwards, and spread rapidly throughout rice growing regions, accounting for 50% of total area planted by 2009 (Khush 2013). These varieties were associated with a yield advantage varying between 10-35% over traditional in-bred rice (Cheng et al. 2007a; Huang et al. 2016; Khush, 2013; Peng et al., 2008; Wang et al. 2014; Xie et al. 2013). A subsequent 'super-hybrid' rice project was initiated in 1996. Between 1998 and 2005, 34 commercially released super hybrid rice varieties were grown on a total area of 13.5 million

ha and produced an additional 6.7 million tonnes of rice in China (Cheng et al., 2007b). These hybrid varieties produced a grain yield of 12 t/ha in on-farm demonstration fields, 8 — 15% higher than the hybrid check varieties (Peng et al., 2008).

The hybrid rice program was launched in India only in 1989, releasing 65 hybrid varieties by 2013. However, the area devoted to hybrid rice in India was only 4% (Singh et al 2015), and most of this was in states outside WB (Prasad et al 2012). Low adoption in India has been attributed to higher seed costs (as every year new seeds have to be purchased instead of recycling from the previous crop), fertilizer requirements, greater susceptibility to disease and pests, and problems with low market price owing to problems with cooking quality (Nirmala et al., 2012; Viraktamath et al., 2012; Siddiq and Prasad, 2012; Singh et al., 2015). Not much is known about how these problems were overcome in China.

The public sector played a more important role in R&D efforts for hybrid rice in China. 31 of the 43 varieties released in China were developed by the public sector (including SOEs, universities and state research centers), while another 5 involved joint public-private ventures. In contrast, 40 out of the 65 hybrid varieties in India were developed by private companies. Viraktamath et al (2012) describes how some of the problems associated with slow development in India were related to inadequate public sector investment in research, diffusion of technology and seed production (90% of which happens to be produced by private seed corporations). Karunakaran (2013) estimates 2008 total spending on agricultural R&D to be $3.4 billion (0.5% of GDP) in China, $2.3 billion (0.4% of GDP) in India, as compared to an average of 0.56% of GDP across all developing countries, 1.8% in Brazil, 3.6% in Australia and 4.7% in Japan.

5.2 Land Acquisition Policies

The process of urbanization and industrialization requires a reallocation of key factors out of the agricultural sector into industrial and service sectors. One of the most difficult reallocations in practice concerns land which is converted from agricultural use to factories, roads, office buildings and homes for urban dwellers. In countries like China and India dominated by smallholder agriculture, building even a single factory requires acquiring land from thousands of small farmers. Under laissez faire a prospective factory builder would

have to negotiate simultaneously with all these farmers, which is a forbidding exercise in coordination besides providing individual farmers to hold up the entire project by asking for a sale price that greatly exceeds their true reservation value. The problem is akin to the free rider problem associated with any public project. Even in market societies, therefore, this market failure creates a rationale for rules of eminent domain which empower the government to appropriate private property from multiple owners for the sake of building (or allowing the building of) public projects whose aggregate social benefits outweigh the costs. Such powers of eminent domain wherever exercised require expropriated famers to be compensated, but it is very hard to design acquisition systems which adequately compensate all farmers since the latter are privately informed about their true reservation price. Usually acquisition laws require farmers to be compensated at least at the market value of the property (though compensating at the market value would still be inadequate for those farmers for whom the personal valuation of their land exceeds its market value). But in practice these laws are often not followed, either because problems in assessing the true market value of land (owing to thinness in land markets, or problems assessing the true quality of the land), or because the government intentionally pays less compensation compared to the market value. This can then give rise to farmer distress leading to adverse inequality impacts and possibly political protests.

Both China and India have been subject to these problems in recent decades. Between 1998-2005, the constructed area of Chinese cities grew from 214 sq km to 325 sq km. Cao et al (2008) estimate that this process caused 2.5-3 million farmers to be dispossessed every year, constituting the largest single source of farmer protests (involving approximately 385,000 farmers in 2006 alone). Liu et al (2014) estimate a total of 40 million farmers had been dispossessed by 2006, and estimated this number would grow to 100 million by 2020. Cao et al 2008 explain that the protests were triggered by compensations paid by local governments that were below market value by a huge margin: they were 7 to 10 times lower than the prices charged to private developers, with the difference retained by the local governments. This bolstered the finances of the local governments, and thereby their capacity to finance large urban infrastructure projects (besides also possibly generating high opportunities for corruption). Effectively this meant that the farmers (rather than the

developers) ended up financing urban infrastructure (rather than the actual beneficiaries of the infrastructure). As we explain in the next section, the problem was compounded by competition across different city officials to attract private investment, induced by policies of the central government where local mayors and province governors' promotion prospects depended on how well they fared in boosting growth in their city relative to growth in other parts of China. The central government has also sensitive to the problems faced by farmers and sought in various ways to limit the extent to which these problems arose with suitable laws governing compensation. However, Cao et al 2008 report from a 16 city survey that 50% of the land acquired violated these laws. Farmer perceptions of unfairness were compounded by the lack of any systematic procedure for determining actual compensations that were based on negotiations and discretion of local government officials. Ding (2013) argues that the process resulted in possible over-investment in manufacturing, manifested 30% of real estate consisting of industrial properties as compared to less than 10% in Hong Kong, Seoul and Paris.

West Bengal has also been subject to serious political problems arising from land acquisition via eminent domain. Indeed, there were two prominent cases of such acquisition in 2006 and 2007 in Singur and Nandigram respectively where the Left Front government acquired land from a large number of farmers under the aegis of the 1894 Land Acquisition Act, in order to allow prominent industrialists to build a car factory and chemical hub respectively. These acquisitions led to a large number of farmer protests, eventually creating a law and order problem resulting police violence against the protesters. The news of these incidents were widely circulated in the media, generated widespread criticism from civil society groups, intelligentsia and activists. The protests led to cancellation of both projects. The opposition party TMC capitalized on these events in its electoral campaign to unseat the Left Front, eventually succeeding in defeating the Left Front and wresting an absolute majority in the 2011 state legislative elections. While these events were not the only cause of the loss of power of the Left Front after 35 consecutive years of incumbency, they likely did contribute to it (Bardhan et al 2014).

Interestingly, compared to the Chinese experience, the problem in WB was less related to systematic under-compensation of farmers whose lands were acquired. Ghatak et al

(2014) in their detailed study of lands acquired in Singur show that on average the actual compensation paid by the government was slightly above the legally required compensation of 130% market value (even when the market value used in their estimates were self-reported by the farmers). The problem instead lay elsewhere: in the dispersion of actual compensations around the average. Owing to outdated land records, the government misclassified land quality, resulting in overcompensation of some farmers and under-compensation of others. It was the latter group that constituted the bulk of the protesters. For the latter farmers, detailed survey evidence of their earnings from different sources show that they were indeed left worse off. Besides direct losses of the owners, there were significant indirect costs borne by other groups: tenant farmers who were leasing in land that was acquired were no longer able to cultivate those lands, and landless agricultural workers lost employment opportunities. Neither of these two groups were entitled to any compensation under the 1894 Law.

Similar problems of farmer, civil society and media protests have arisen in other parts of India as well. Misra (2020) provides evidence that a large fraction (approximately 40%) of proposed SEZ projects in India did not receive approval, and that a political economy model of the cohesiveness of farmer coalitions (which is assumed to be decreasing in land inequality, religious and social fragmentation) can explain the pattern of lack of approvals across different Indian states. As the demise of the Left Front in WB showed, the fact that incumbent governments in Indian states are subject to electoral competition means that the scope for land acquisition is more limited in India compared to China. The WB experience and the protests against SEZs in other states eventually led the Indian Parliament to supercede the antiquated 1894 Land Acquisition Act and pass a new law (LARR) in 2011 governing land acquisitions which imposed several lengthy regulatory checks. These contributed to a further slowing of approvals after 2011. It is therefore quite plausible that the greater political resistance to land acquisition arising from pressure exerted by farmer groups and related civil society activists were partly responsible for the slower speed of structural transformation in India.

5.3 Urban Governance

I turn now to differences in patterns of urban governance between the two countries. While systematic research on this topic is lacking, a number of different case studies, reports and examination of municipal government budgets indicate wide differences in the extent of financial autonomy, responsibilities devolved as well as accountability of urban government officials. This implies corresponding differences in the organizational capacity and motivation of urban governments to build infrastructure and attract private investment.

The importance of infrastructure is suggested by Table 3 which compares firm owners' responses to questions regarding the most significant obstacle to their doing business in different locations in WB, Hefei in Anhui province and the average across 25 cities in China.[4] While these indicate relative importance of different obstacles in different regions, and incorporate a combination of demand and supply factors rather than the latter alone, it is notable that access to finance, informal sector practices, and tax rates seem to be the most important problems in both WB and China (rather than problems emphasized in much of the academic literature such as labor regulations, corruption, access to land or courts). However, they differ significantly on the importance of one dimension: electricity which was listed more often in WB (13.4%) than in China (4.8%) or Hefei (0.4%).

Infrastructure of course involves a larger range of services than just electricity supply. The 2011 Urban Infrastructure Report submitted by a High Powered Expert Committee (HPEC) appointed by the Ministry of Urban Development of the Indian government reported severe deficiencies in Indian cities relative to international norms with respect to drinking water, sewerage, solid waste management, roads, street lights and affordable housing. Indian cities have huge slum populations with severely deficient services. For instance, municipal water supply is available to Indian households for an average of 1-6 hours per day, compared to 24 hours in Chinese cities. Required improvements were listed in municipal finances (tax reforms and transfers from upper level governments), accounting systems, human resources and land acquisition processes (which accounted for 70% of delays in

[4]The World Bank surveys are conducted across states in India and cities in China. Hefei is the only one city from the selected three provinces in China covered by the survey. So we compare WB with Hefei and the average across Chinese cities.

Table 3: **Firm Survey Responses on Obstacles to Private Investment**

Percent of Firms For Whom Most Significant Obstacle was:	WB	China (average)	Hefei
Access to Finance	24.7	22.4	13.9
Informal Sector Practices	19.0	19.6	42.5
Tax Rates	17.2	15.1	4.2
Electricity	13.4	4.8	0.4
Labor Regulations	3.9	1.9	0
Corruption	3.3	1.2	0
Licensing and Permits	3.3	0.2	3.9
Access to Land	1.9	5.6	23.9
Courts	0.1	2	0

Source: World Bank Firm Surveys, WB 2014, China (average of 25 cities) 2012.

infrastructure projects in India in 2008). It also highlighted deficiencies in organizational structure and accountability systems in municipal governments, an issue we return to below.

Differences in infrastructure reflect differences in spending on infrastructure. Per capita municipal expenditures in India in 2010 were estimated at $50 per year by a McKinsey Report (cited in Ahluwalia et al 2019), compared with $362 in China, $508 in South Africa and $1772 in the UK. Corresponding capital expenditures were $17 in India, $116 in China, $127 in S Africa and $391 in the UK. Based on data reported in Ahluwalia et al (2019), municipal government expenditures in WB constituted 0.8% of state GDP in 2013. This contrasts with 4.08% in China, 2.87% in Anhui, 2.01% in Jiangxi and 2.94% in Hunan (based on data from China City Statistics Yearbooks).[5] Song (2013) estimates urban infrastructure investments in China rose from 0.5% of GDP in 1980 to over 3% in 2003,

[5]It could be argued that these estimates are not comparable across China and India because local governments in China bear most of the responsibility for education expenditures, whilst this is a state government responsibility in India. However, even if we subtract spending on education from the spending estimates in China, we obtain urban fiscal spending to be 3.58% of GDP in China, 2.52% in Anhui, 1.79% in Jiangxi and 2.65% in Hunan, which is higher than the corresponding proportions in WB by a factor of at least three times.

and thereby declined slightly to 2.5% in 2008.

Part of the reason for low spending on municipal services in India is low tax raising capacity of municipal governments. In 2013 grants from upper level tiers of government constituted 73% of total income of municipal governments in WB. Property and land taxes accounted for only 13% of their revenues, with ratepayers constituting 6.6% of the population, and collections amounting to 26% of assessed demands, reflecting low collection capacity (West Bengal Municipal Statistics 2013).[6] Clearly, WB municipal governments are restricted in their fiscal autonomy. This has been further undermined in recent years after the passage of the new goods and service tax (GST) on an all-India level, which seeks to harmonize taxes throughout the country by eliminating devolution of octroi and other local taxes from local governments.

In contrast, in China the role of central budget grants in local urban finances fell from 40% in 1980 to near 0 in 2000 (Song 2013). After 2000, three sources accounted for approximately one third each of total spending of urban bodies: domestic loans, the local government budget and self-financing mechanisms involving extra-budgetary revenues such as land transfer fees. Song also provides detailed econometric evidence of the role of infrastructure (roads and transport) in stimulating the conversion of land to urban development and thereby raising land prices. Resulting increases in land transfer fees then constituted a form of self-financing in China that seem to have no equivalent in WB.

In India, borrowing constitutes a small fraction (between 2-3%) of municipal budgets. The municipal bond market which developed in India in the late 1990s (allowing Kolkata municipal bodies to supplement their financing in this manner) contracted sharply from 2005 onwards. Banerji et al (2014) explain this by growing creditworthiness concerns on the part of bond investors regarding the capacity of municipal governments to generate own revenue, low productivity of infrastructure investments resulting from low organizational efficiency, and about whether elected governments would honor repayment commitments.

The allocation of grants to municipal bodies by the WB state government do not appear to follow any transparent process, so it is hard to understand how they are determined, and

[6]Admittedly WB is an outlier among Indian states in this regard, as the grants constitute 40% of municipal income for all Indian municipalities on average.

whether they generate incentives to municipal governments to raise local taxes. Moreover, accounting practices are lax, as the Comptroller and Auditor General (2015) report on WB mentioned that most urban local bodies failed to present accounts on time, and exhibited inadequate internal control mechanisms (quoted in Ahluwalia et al 2019).

There is also a growing literature on selection and incentives of local leaders in China resulting from a top-down structure within the CCP generating a system of career mobility via promotion incentives. Maskin et al (2000) initiated this literature highlighting a key difference between Soviet style 'U-form' governments based on line ministries and Chinese style 'M-form" decentralization to local governments, resembling different forms of quasi-corporate organization. Much of the related literature has dealt with this mechanism as it applied to leaders of provincial governments in China whose promotion prospects to the Central Politburo depended on competition based on measures of growth performance of their respective provinces (Li and Zhou (2005), Xu (2011) and Jia, Kudamutsu and Seim (2015)). Papers by Zhang (2015) show a similar phenomenon applied also to career mobility patterns of city mayors, using data from leaders of 312 Chinese cities between 1994-2010. Chen, Li and Yu (2018) show that performance evaluation systems for city mayors were modified in 2005 to give greater weight to reduction in sulphur dioxide emissions, which subsequently resulted in a reduction in emissions as well as local GDP growth rates. Hence the evidence suggests an explicitly designed top-down incentive mechanisms for city mayors to pursue goals set by the CCP. The existence of such disciplinary mechanisms reflect the unique political hierarchy within the CCP. While no comparable studies exist of selection and career incentives of city leaders in WB or India, it seems unlikely to be as high powered as in the Chinese system.

6 Summary and Concluding Observations

In summary, both WB and the comparable Chinese provinces experienced similar growth in GDP per capita between 1980-2014, while WB experienced slightly slower growth in consumption per capita, and a substantially slower structural transformation from an agrarian to an urban industrial economy. Living standards were higher in China to start with, with

a similar gap in proportional terms but widening one in absolute terms. While data comparability problems make it hard to compare the extent of poverty reduction it appears that poverty dropped faster in China. On the other hand, consumption inequality rose markedly in China, but fell in WB. Indices of human development were throughout higher in the Chinese provinces, though on some dimensions the gap narrowed and in others they remained the same. Growth rates in agriculture were similar; rice yields in the rice growing provinces were throughout almost double that of WB, most likely explained by greater investments and success in R&D and diffusion of hybrid rice in China. Urbanization and industrial growth in the Chinese provinces outstripped WB by a wide margin.

While there are many possible explanations for the faster structural transformation in China, we discussed two that stemmed from its distinctive political economy. The first was a faster pace of land acquisition from farmers for purposes of conversion to factories, real estate and construction of related urban infrastructure. Expropriated farmers were substantially under-compensated in China relative to market value, unlike WB. This under-compensation provided a substantial fraction of local governments financing of urban infrastructure spending. In both countries the process of land acquisition gave rise to farmer protests, but the stronger exposure of incumbent governments in India to electoral competition and pressure from farmer groups, media and civil society caused many SEZ projects in India to be reversed or not receive approval. Democratic institutions in India therefore likely imposed stronger curbs on the structural transformation process.

The second difference was in the nature of urban governance. There was greater devolution of authority and responsibilities to Chinese city governments, accompanied by accountability of appointed city mayors to upper echelons of the CCP induced by a within-party promotion mechanism. Accordingly city governments had greater financial resources, autonomy and incentives to pursue goals of growth by investing in city infrastructure in order to attract private investment. Municipal governments in India (and WB in particular) were devolved less authority and finances by upper level governments, had low tax collections and fewer instruments of financing, organizational efficiency was low as responsibility for infrastructure investment was divided among municipal, state, central governments and parastatal corporations, oversight mechanisms were weak, and overall the Indian state de-

voted less resources on urban infrastructure. By enhancing the organizational effectiveness of city governments, the Chinese state therefore played a more positive role in the process of urbanization and industrialization.

I conclude with some observations on the macro-development literature on structural transformation in the light of our descriptive account of comparative development in the selected Indian and Chinese provinces. This literature focuses on the substantial gaps in labor productivity (Gollin et al 201?) and wages (Munshi and Rosenzweig 2016) between urban and rural areas that are unlikely to be explained by human capital differences, thus raising the question why these gaps persist rather than get eroded by labor migration that generates faster structural transformation. Part of the answer may lie in policy induced restrictions on rural-urban migration. However such restrictions were indeed in place in China in the form of its *hukou* registration system; there were no such policy-based migration restrictions in India, so this seems to be unlikely to account for the larger rural-urban wage gaps in India. Some recent literature has explored the role of differences in informal insurance between rural and urban areas in India (Munshi and Rosenzweig 2016), uncertainty, risk aversion and borrowing constraints faced by rural households in neighboring Bangladesh (Bryan et al 2011) and the possible role of non-pecuniary differences in urban and rural standards of living (Lagakos et al 2020). Such non-pecuniary differences may arise from poor amenities in urban slums resulting from low investments in urban infrastructure, besides weaker social networks in urban areas that limit access to consumption insurance and information. Differences in urban governance between China and India may thus partly explain explain the slower rate of labor migration in India, besides lowering the growth of private investment in urban areas that lowered growth of employment opportunities.

References