A Comparative Analysis of China and India's Manufacturing Sectors

Yingqi Wei and V. N. Balasubramanyam

The Department of Economics
Lancaster University Management School
Lancaster LA1 4YX
UK

LUMS home page: http://www.lancaster.ac.uk/lums/

A Comparative Analysis of China and India's Manufacturing Sectors

Yingqi Wei
International Business Research group
Leeds University Business School

V. N. Balasubramanyam
Department of Economics
Lancaster University Management School

February 2015

Abstract

China's manufacturing sector led by labour intensive manufactures has grown much faster than that of India both in terms of production and exports. It is often argued that India's manufacturing sector that is relatively capital intensive must now follow China's example and promote labour intensive manufactures. This is said to be essential if India were to promote growth and employment that are both essential for reducing the relatively high levels of poverty in the country. This paper argues that it may not be feasible for India to follow China's growth strategy based on exports of labour intensive manufactures. India may have missed the boat and in any case it has failed to implement a strategy for agriculture of the sort that China put in place to provide its manufacturing sector with low wages and low cost raw materials. India, however, should utilise its services sector, mostly the IT services, to promote its nascent non- farm manufacturing sector in the rural areas. There may be lessons here from China's town and village enterprises TVEs) programme.

1. Introduction

Is India likely to catch up with China's growth rate? Why can't India follow China's model of manufacturing led growth? If China can generate jobs in the manufacturing sector why can't India, an equally populous country, also do so? Will India overtake China (Khanna and Huang, 2003)? These questions are frequently heard in academic and policy discussions on the failure of India's manufacturing sector to generate employment and contribute to the reduction of poverty in the country on the same scale as China. Several commentators are emphatic that India should follow in the footsteps of China. While growth has helped India reduce its poverty ratio[1] down from 45.3 of the population (403 million)in 1993- 1994 to 21.9 (269 million) in 2011-12, its transition to a modern economy lacks dynamism: it has to move the vast majority of its workforce out of farming into non-farming activities. With the services leg doing all of the walking, the economy can only limp along towards this transition. For a more rapid transformation, India must walk on two legs. That means more rapid growth of the labour-intensive manufacturing (Panagariya, 2008). The National Manufacturing policy of 2011 aims to create 100 million jobs in the manufacturing sector by 2022 and increase the share of manufacturing in GDP to 25% from the present 18%. One prime means of achieving this objective is the creation of National Investment Manufacturing Zones a'la China's policy of building large economic zones. Could or should China be the role model for India?

This paper provides a brief comparative analysis of India and China's manufacturing sectors. It argues that whilst the two countries have much in common, China's policy framework and growth and development experience may not be a role model for India. Political set up, geo-physical features, historical inheritance of policies, demographic structure all differ significantly between the two countries. These differences have an impact on the sort of policy options open to the two countries.

Section 2 of the paper briefly outlines the structure and performance of the manufacturing sector in the two countries. Section 3 and 4 review the proximate reasons for the differences in economic policy and performance of the manufacturing sectors between the two countries. Section 5 presents the thesis of the paper that although there are lessons that India can draw upon from China's growth experience they are limited and the country has to formulate a policy framework drawing upon its endowments. The final section concludes the paper.

2. Structure and Performance of the Manufacturing Sector in the Two Countries

China and India are the two most populous countries in the world with a total population of 1.35 and 1.24 billion respectively (Table 1). They are also the two largest economies measured by GDP in the world next to the USA. China is ahead of India on most economic and social indicators except three. India can claim to contribute much less than China to the degradation of the environment and has a slightly better score on the global corruption league tables. The age dependency ratio in India is higher than that in China at present because of the relatively high proportion of non- working young

---

[1] These estimates are based on the Tendulkar methodology of estimating poverty. This methodology estimates poverty levels on the basis of expenditure in rupees required to purchase a bundle of goods required for sustenance. For the year 2011-12 those spending less than Rs 27($0.43) in the rural areas and Rs 32($0.53) in the urban areas were considered to be poor. A recent report by the Rangarajan Committee puts the poverty level for India s a whole at 29.5%
Source Planning Commission data base .

and not the non- working old people. In other words, the population pyramid is in India's favour more so than that for China. In China, the pyramid has just begun to shrink while in India it is expanding at the base. India's demographic structure is an asset for promoting growth but it can only do soif the young are educated and trained. China ranks above India on most counts in the league table with the exception of the Gini ratio and the age structure.

China's ranks above India on the size of its GNP, per capita GNP and the growth rates of both the total and per capita GNP (Figures 1 & 2). For the purposes of this paper, it is the structure and performance of the manufacturing sector that is of significance. First, share of manufacturing in China's GDP stood at 32.5% in 2010 compared with a low of 17.5% in India in 2012. Number of people employed in industry in China was around 30% in 2011 where as in India it was around 25% in 2012. Another distinguishing feature of China's manufacturing sector is the low capital intensity of most of the industries including the high-tech industries compared with that of India (see Table 2)[2]. It is this feature that accounts for the low level of employment provided by India's organised manufacturing sector (Kannan and Raveendran, 2009).

Whilst we discuss in some detail the factors contributing to the differences in factor intensity of the sector in the two countries two points of some distinction needs to be noted. The organised manufacturing sector of India is characterised by a number of small firms at one end of the spectrum and larger firms employing 500 or more people at the other end with very few firms in the middle range. It is these factors that explain the structure of India's manufacturing sector. The firms at the lower end of the distribution that employ 5-9 people account for a high proportion of total employment as much as 55% of the total (Mazumdar and Sarkar, 2013). But the productive efficiency of these firms is very low. And they pay low wages. The firms at the other extreme, those employing 500 or more workers are productive, pay high wages but are intensive in their use of capital. The wage pattern and jobs provided at the two extremes explain in part the transition of the Indian economy from agriculture to services with very few labour intensive firms in the middle range of the sector - now known as the missing middle in India's manufacturing (Mazumdar and Sarkar, 2013). The production process of the firms at the high end of the spectrum is highly intensive in the use of capital and those at the lower end are too small to employ an adequate number of labourers to increase employment.

China's economy presents a contrasting picture on these counts. Firstly, China has a readily available supply of cheap labour for employers to hire and the country has flexible labour market and loose labour regulations. Secondly, China's financial markets are not well developed. Many Chinese firms rely heavily on retained earnings to finance investment and operational costs (Song *et al.*, 2011). In particular, private firms which account for more than half of the country's GDP lack access to financial markets and are compelled to adopt labour-intensive rather than capital-intensive technologies. These two may be the primary reasons for the predominance of labour intensive technologies opted for by the Chinese firms.

The second point to note is that China has moved up the ladder of manufacturing industries from low-tech to high-tech industries over the years. It has though not entirely divested itself of the low-tech labour intensive industries. These industries are re-located in the relatively poor western parts

---

[2] As asset prices have gone up in China, we cannot use the usual measures of capital intensity, i.e. the ratio of assets to output or the ratio of capital to labour, to compare capital intensity of manufacturing industries in two countries. One way to get round this problem is to look at share of non-wage value added in total value added and this is the measure used here.

of China and continue to contribute to employment and growth of the economy. The paper discusses these and other features of the manufacturing sectors in the two countries in some detail.

3. India's Economic Policy Framework

There are three distinct phases in India's economic policy framework over the years; The Nehruvian Phase (1950-1964) The Indira Gandhi years (1966-84).The Rajiv Gandhi years (1984-89) and the Liberalisation Era (1991-) The Nehruvian years saw the inauguration of planning and the import substitution oriented industrialisation policy. It should be recognised that the Nehruvian IS policy framework though ideologically driven was not entirely averse to private enterprise. The framework was that of a mixed economy with a role for private enterprise though a constrained one with bureaucratic rules and regulations. The import substituting industrial policy framework with an emphasis on capital intensive heavy industries was instituted during the mid fifties with the inauguration of the second five year plan. The policy framework was driven by ideological considerations that the country should be free of economic dependence on the developed countries for its investment goods. It was the belief of the policymakers that an economic model oriented towards producers goods now and consumers goods later would maximise the production of goods and services in the long run. Put another way the policy makers opted for a low discount rate in evaluating the present value of future income streams - less now more later was their economic philosophy.

Nehru's Fabian socialism lasted only for his life time and was followed by the state dominated Indira Gandhi years of increased state regulation, nationalisation of banks and the insurance business and hardening of rules and regulations governing FDI. It is not much of an exaggeration to say these were years of economic stagnation The Rajiv Gandhi phase saw attempts at liberalising the economy with a mild relaxation of the industrial licensing system, reduction of tariffs, an emphasis on the development of information technology and increased subsidies to agriculture. The liberalisation phase saw the virtual abolition of the industrial licensing system, a reduction in some tariffs, substitution of tariffs for quotas, reduction in the number of industries reserved for public enterprises a number of fiscal reforms designed to streamline the system, increased role for the private sector and relaxation of regulations governing FDI. These liberalisation measures though half hearted did have a salubrious impact on the economy. Growth rate of the economy doubled from the Hindu Growth rate of 3% per annum of the previous years and there was also a reduction in poverty levels by around 10%

There is a vast literature on the IS policy framework that was in place until the year 1991 with a gradual move towards liberalisation introduced in the year 1991 (Bhagwati and Desai, 1970; Bhagwati and Srinivasan, 1975). Suffice it to note here that the manufacturing sector was shielded from international competition with quotas and tariffs on imports, a complex system of industrial licensing governed the entry of private firms into the manufacturing sector, production of most investment goods was the preserve of state owned enterprises (SOEs), the production of several consumer goods was reserved for small scale industry sector firms that also had access to various subsidies, a number of industrial financing agencies set up by the government managed financing of industry, agriculture was provided with a number of substantial subsidies including subsidies for fertilisers and electric power and the Food Corporation of India managed the distribution of subsidised food to the poor and the needy. This varied and complex economic policy framework aptly described as the Byzanytine system (Desai Ashok (2001) in V N Balasubramanyam,

Conversations with Indian Economists, Palgrave, Basingstoke) was in place until the mid-1980s when the licensing system was relaxed.

A significant break with the inward looking economic policies administered by the bureaucrats and supported by the politicians seeking votes came to a virtual end in the year 1991. The reasons for the dramatic change in policies from a regulated economic system to one that was exposed to market forces much more so than before is often debated with those arguing that it was all done at the behest of the IMF and others arguing that it was long overdue though expected. Whatever be the motivation for the liberalisation, Indian economy departed from the earlier control regime towards one with a market determined one.

The 1991 reforms, a land mark in India's recent economic history, did away with the licensing system, eased restrictions on FDI, reduced tariffs on imports from a peak of 300 per cent on the average to 15 percent, reduced reservation of industries for public enterprises and introduced a number of fiscal reforms designed to streamline the system. These reforms yielded fruit as stated earlier. Growth rates increased markedly from the Hindu Growth rate of around 3% per annum, poverty levels declined substantially and there were improvements on most other development indictors. First, growth rate of GDP that was around 3% the so called Hindu growth rate until the mid-1980 reached a high of 5.8% between 1990-1999, but it further climbed to 6.9% throughout the first decade of the 21st century and even went past 10% in 2010 before declining to 6.6% in 2011 and then 4.7% in 2012 (see Figure 1) for various reasons including a high rate of inflation and repercussions from the global economy. Second, per capita income levels increased from $1,812 in 1991 to $1,503 in nominal rate and $5,050 in PPP dollars (see Figure 2). Third, levels of poverty (defined at national poverty line) declined from 45% (403 million) in 1993-94 to 21.9% (269 million) by the end of the year 2011-12. Fourth, India's participation in world trade increased significantly, total trade that accounted for 13% of GDP in the year 1990 had increased to 42% by the year 2012.

Even so, levels of poverty remain high compared with that of China, contribution of the manufacturing sector to both employment and the GDP is low compared with the record of China (see Figures 3-4 and Table 3). There are significant differences between the economic policy orientation of China and India. Much of this is to be attributed to the differing political setup in the two countries - a democratic set up in India and the one party rule by the communist party at the centre in China. Policy formulation and implementation in a democracy is most of the times a compromise between parties with differing priorities on development, a process subject to change with changes in the political parties that are elected to office. In India the system is much more complex than in most other democracies given the widespread socio-cultural diversity of the country with sixteen officially recognised languages and several castes and sub-castes in the Hindu religion. According to the cultural diversity index produced by Erkan Gören of the University of Oldenberg in Germany, India has a figure of 0.64, which is in sharp contrast to China's 0.14. The political system in recent years has gone even more complex with differing parties in power in many of the states of the Union of India from the one at the centre, itself at times a coalition of parties. Although there are socio-cultural differences in China too they are much less marked than in India. These factors have influenced the differences in economic policy framework between the two countries.

One of the features of the Indian economy,that departs from the experience of most other developing countries and received wisdom on the transformation of economieswith growth,is the high share of services in GDP surpassing that of manufacturing and agriculture cited earlier (see Figure 4). Agriculture contributed 29% to the GDP of the country in the year 1990, its share had declined to 18% by the year 2012 but more than 47% of the labour force depended on agriculture.

The contribution of organised manufacturing that was estimated at 15.08% in the year 1990-91 had decreased marginally to 14% by 2009-10 and contributed 10.5% tot total employment. Share of services in GDP had increased to a significant 56% by 2012 from around 45% in the year 1990.

Business services, software, and financial services are the main components of the services sector (Eichengreen and Gupta, 2011). The factors that have promoted the growth of services sector may differ between the various states of India, but two of them may be significant for all of them. First is the significance of trade and finance in India's economic history through the ages, especially so from the British colonial days. The ratio of trade to domestic product increased from a low of 1 to 2% in 1800 to 20% by 1914 (Roy, 2011). The second factor that is allied to the first is the education system that is to this day somewhat elitist and in the past caste based. As Roy puts it

"the historical pattern of demand for education at all levels was biased towards certain castes and communities because these people had an inherited association with literate services. Groups that had contact with scribal professions, medicine, teaching, and priesthood, in the pre-colonial times, entered education, medicine and public administration in the colonial times. These classes and castes eagerly used the new schools and colleges, while other classes and castes entered schools on a smaller scale, and dropped out more readily. The correlation between family history of literate services, preference for service professions, and thus, preference for education, was especially close in the three port cities – Madras, Bombay, and Calcutta."

Indeed, India's software industry of the present day reflects the sort of caste oriented education that promoted services in the past. The industry is dominated by members of the middle class, mostly upper castes, especially the Brahmins, that were prominent in civil service jobs in the past (Taebe, 2003; Upadhya, 2004). The legacy of history is also reflected in the sort of managerial expertise and its contribution to the manufacturing sector we discuss below.

It is often argued that Indian policy framework has neglected agriculture for long and hence the absence of a transformation of the economy on traditional lines with growth in agriculture providing the labour raw materials for the manufacturing sector. The much debated agricultural policies of India too have promoted agriculture but they fall short of the achievements of China, discussed later, by a long stretch. India too embarked on land reform policies in the wake of independence from British rule with a visible impact on the fortunes of the rural population. Policies designed to redistribute land, with ceilings placed on the size off farms that could be owned by individuals, and the redistribution of the surplus land do not seem to have had much impact on the fortunes of the poor farmers. But legislation designed to eliminate intermediaries or the so called Zamindars between the farmers and the state and provision of security of tenure to farmers is reported to have had a substantial impact on rural poverty (Besley and Burgess, 2000). Much more impressive is the success of India's technology oriented agricultural policies introduced during the mid-1960s under the banner of the Green revolution. Most commentators on Indian agriculture acknowledge the contribution of these policies, centred on the provision of high yielding varieties of rice and wheat and fertilisers to the farmers, to increased yields and India's self sufficiency in food grains. In addition to these polices there were also the subsidies of various sorts on inputs and price support for the farmers that contributed to the growth of agricultural output. Indeed, since the year 2003, agriculture has recorded remarkable growth compared with earlier years with the exception of 2008 and 2009. Whilst average rate of growth of agricultural output was 2.4% during the years 1994-95 to 2004-05, it increased to 4% for the next nine year period 2004-05 to 2013-14. Fishing, livestock, horticulture and food grains all feature in this impressive performance. Increased private investment is reported to be the main driver of this remarkable growth of agriculture (Deokar and Shetty, 2014).

Although the progress of the agricultural sector is impressive, its contribution to employment, reduction of income inequalities and poverty leaves much to be desired (For an incisive discussion of these issues see Vaidyanathan (1988); Vaidyanathan (1996); Vaidyanathan (2000). Unfortunately food self sufficiency has not increased food consumption of the poor, poverty levels in most parts of the country though they have declined considerably leave much to be desired. Obviously the purchasing power of the poor is inadequate to feed themselves adequately. Allied to this problem, and most intriguing, is the fact that despite the impressive growth of agriculture, centred on productivity, more than 6o% of the population continue to live in rural areas. It should be noted that the millions living in rural areas though are not all jobless and destitute. The rural non-farm sector provides a substantial number of jobs for the rural labour force, but at low wage rates and without any job permanency.

Growth in agricultural productivity should reduce not only labour required in agriculture but also reduce food prices, both of which should provide an adequate supply of labour for the manufacturing sector at a low real wage, the demand for whose goods can be expected to increase with growth of incomes. In due course of time, with the continued growth of the economy the relative share of services would increase in the economy. This in fact is the China's experience . Whilst China demonstrates the existence of the Kuznets phenomenon India defies it[i]. The organised manufacturing sector accounts for 14% of GDP and provides employment for 11% of the total labour force estimated at around 484 millions. Contrary to expectations, the services sector contributed as much as 56% of GDP in 2012 and has surpassed the share of manufacturing and its growth rate, a somewhat of a premature phenomenon. The low level of employment provided by the manufacturing sector in an economy endowed with substantial labour contrasts starkly with the record of China discussed earlier.

It is noteworthy that the implementation of agricultural policies including the introduction of new technologies during the mid sixties was done without extended policy debates and confrontations between various policy makers and institutions such as the food and agriculture ministry, the ministry of finance and the planning commission. These set of policies ,that departed from the earlier state controlled policies,and veered towards market oriented ones were spearheaded by politicians with a vision such as Lal Bahadur Shastri, and C. Subramaniam, prime minister and minister for food and agriculture respectively during the mid-1960s (Varshney, 1998). The implementation of these policies during the mid- sixties attests to the significance of far sighted political leadership in a democracy fraught with controversy on most issues. We now turn to the broad policy framework of the Command Economy - China.

4. China's Economic Policy Framework

China's economic policy framework of export led growth initiated in the year 1978 was a retort or a steadied put down of the ideologically oriented heavy handed policies of the past. Prior to the late 1970s, China followed the centrally planned economic model. Like other countries that adopted planning policy, the experience was more negative than positive. Despite the average growth rate of 5.8% between 1952-1978, many people lived under the $1 per day (PPP) poverty line. According to the World Bank's estimates the figure was more than 60% and China was an insignificant participant in the world economy. The highly unpopular cultural revolution and the demonstrable success of neighbouring countries such as the "four tigers" with liberal economic policies persuaded China and the Chinese people to support support significant economic reforms.

It is noteworthy that China didn't administer sharp swift shocks to the highly protected markets, extensive state ownership of industry, and various regulations of the economy in force when it embarked on liberalisation policies. The introduction of a liberal policy framework including reduction of tariffs was done gradually over decades (Rodrik, 2006). The development of China's manufacturing is the result of a combination of factors including labour reallocation from agriculture to manufacturing, TVEs, privatisation, FDI, Chinese diaspora and the re-organisation of Asian production networks.

The economy of China has grown fast since its opening up in 1978. Between 1979 and 1992, China grew at 9% per annum and the average growth rate increased to 10.4% in the next two decades (Lin, 2011). Such rapid growth has been associated with the Chinese government's pragmatic approach to reforms that are of an evolutionary, experimental and incremental nature (Sachs and Woo, 2001).

Despite Chinese central planners' favouritism towards urban industrial sector over agriculture between 1952-1978, China's reforms first took shape in the agriculture sector with the household responsibility system (HRS) replacing the people's commune system. Individual households were instituted as the basic unit of farm operation, as opposed to a collective team of 20 to 30 households in the past. The HRS gave individual households autonomy over production and farmers were given incentives to increase output. The positive role HRS played in China's agricultural growth is widely documented in the literature (Lin, 1992). Between 1978 and 1984, the average annual growth rate of agriculture was 7.7%. The significant improvement in agriculture helped the country to release labour from land to industry and service sectors (Hu and Khan, 1997). This labour reallocation process was necessary as China' agriculture was characterised by an egalitarian system of distribution of cultivated land with more than 200 million rural households, each cultivating less than 0.55 hectares (Wang and Rungsuriyawiboon, 2010) . With the improvement in productivity in the agricultural sector, there was no need for a large number of people to stay on land. Agricultural employment as a share of labour force fell from more than 70% in 1978 (Sachs and Woo, 2001) to 60% in 1990. Fast forward to 2011, the figure stood at only 35% (see Table 3). The release of such a large number of economically active population from land hugely helped China's development of the labour-intensive, low-skilled manufacturing sector. According to a national survey by the All China Federation of Trade Unions in 2007, the migrant workforce, with an average age of 32 and formal schooling of 10.4 years, was estimated to be 120 million strong, accounting for 64.4% of all workers in industry (Friedman and Lee, 2010). This highly flexible labour force with the required level of schooling offered manufacturers the much needed labour for industrial growth.

In addition to the introduction of the HRS, China successfully re-introduced marketization. In implementing agricultural reforms, China first tried a dual-track approach, i.e. the establishment of a market track in parallel to the pre-existing planning track. Under the dual-track approach, farmers were required to deliver a portion of the output to the state, but they were allowed to sell the rest of the output on the free-market. The success of this strategy influenced the planners to try it out in the industry and service sectors too. The agricultural reforms have vastly facilitated the growth of the non-state sector of the economy. Farmers with the newly earned profits, some of which was surplus to requirements in the agricultural sector, set up or pulled resources into the town and village owned enterprises (TVEs). These policies promoted productivity of agriculture, reduced real wages and provided labour for the manufacturing sector.

TVEs are communal organizations managed by managers through a contract (i.e. management responsibility contract). They are outside of the Chinese government's apparatus and are highly market-oriented. They do not enjoy preferential government treatment, however, they are not also

subject to widespread state regulation. TVEs have played a pivotal role in China's economic development. Between 1979 and 1991, TVEs grew at an average rate of 25.3% in comparison to that of SOE's at 8.4% (Weitzman and Xu, 1994). Much of TVE's output growth could be attributed to TFP growth and secondarily to factor inputs. This impressive performance has transformed TVES from a subsidiary subsector of agriculture to one of the second largest sectors in the economy (Weitzman and Xu, 1994). Though TVEs were not private firms, since they were often owned by local governments or local communes rather than solely by private owners, they introduced competition to the Chinese economy and helped stimulate efficiency of the state-owned enterprises (SOEs). While bankruptcy of TVEs is common (Huang and Meng, 1997), the survivors have proven to be the fittest of all. They were the major export drivers of China's impressive export growth. For example in 1999, the value of TVE exports of US$94 billion accounted for 48% of China's total exports (Fu and Balasubramanyam, 2005) and much of these are labour-intensive products involving simple production techniques (Huang and Meng, 1997).

China's economic success can also be attributed to privatisation. The ownership structure of private firms was not properly defined until 1988 and private firms only became an integral part of the Chinese economy in 1997 and had their legal status established in 1998 (Kanamori and Zhao, 2004; Steinfeld, 2004). However, the private sector grew very rapidly. Not only did the Chinese government lowered entry barriers in most sectors, but it also pursued a policy of "grasping the big, and letting go of the small", which means that SOEs should only be kept in "strategic sectors" and small and medium sized enterprises (SMEs) were either privatised or their ownership transferred from the central government to local governments. Associated with the trend of privatisation, by the late 1990s and early 2000s, most TVEs and SOEs had been privatised (Fan *et al.*, 2013). As a result, the share of state sector in industrial output was reduced from 49.9% in 1998 to 35.2% in 2004. Even within the remaining SOEs, not only the "iron bowl" system was replaced by a monetary incentive-based salary system, but also the relationship between the state and SOE employees was redefined to motivate managers to focus on improving efficiency (Yu, 2013).

China's development in manufacturing has also benefited from inward foreign direct investment (FDI) and China's diaspora. Much has been written on the contribution of FDI to China's growth and there seems to be a consensus on the positive impact of FDI on China's economic growth (Wei, 2004). It is important to note the link between FDI and diaspora. In the early years of China's history of inward FDI, much of the FDI was from Chinese diaspora. At the beginning of China's opening up, the government strategically chose the special economic zones (SEZs) that are in areas bordering Hong Kong, Macao and Taiwan all with a concentration of Chinese diaspora. The government deliberately implemented a policy to attract these diaspora to visit mainland China, not just for economic investments but also social visits. These polices bore fruit given the large volume of investments by the Chinese diaspora. Such investments were often on a small-scale with low- and medium-technology. As Huang (2002) notes they were not the world's best practice firms and their existence was to exploit business opportunities in China created by China's inefficient and financial institutions. However, twelve years since Huang's pronouncement, empirical evidence has shown that these investments were exactly what China needed. These Chinese diaspora-invested firms cooperated with TVEs and other indigenous Chinese firms and introduced them to international markets, freed them from domestic market constraints which favoured SOEs until the large scale of privatisation in late 1990s. The diaspora-invested firms also helped indigenous Chinese firms to exploit the country's comparative advantage in cheap labour and to translate its comparative advantage into international competitiveness. By early 21st century, China enjoyed large world market shares in traditional industries such as leather, shoes and clothing (Gaulier *et al.*, 2007) and had a revealed comparative advantage in a broad-range of labour-intensive industries (see Table 4).

There is no doubt that these low-tech labour intensive industries rapidly advanced China's economy-wide growth of production, income, employment, productivity and exports.

Chinese manufacturing also benefited from Asian production networks. Faced with soaring costs in newly industrialised economies (South Korea, Hong Kong, Taiwan, Singapore, Thailand, Malaysia and Philippine), many multinational enterprises (MNEs) sought low-tech, labour-intensive export platforms that offered low costs. China happened to be in the right place at the right time, given its geographical proximity to these Asian countries and its opening up of the economy beginning in 1978 couldn't have been better timed. Relocation of manufacturing firms from South-east Asian countries to China helped Asian firms and Western firms operating in Asia keep costs down and China to develop its comparative advantage in low-tech manufacturing industries.

In fact, a few years into the 21st century, FDI into China's high-tech industry grew rapidly. In 2001, FDI inflow was US$40.2 billion in the high-tech category, but by 2008, it had shot up to US$208.3 billion, an average annual growth rate of 60% (Liu *et al.*, 2014). There was a structural change in FDI composition by industry, with the share of FDI in high-tech sectors at 66% in 2008, an increase of 9% (?) relative to 2001. FDI in the high tech industries has promoted China's technological upgrading (Wei, 2004). Trade statistics suggest that China is exporting high-tech manufacturing goods such as machinery, transport equipment and electrical and electronics products and achieved a revealed comparative advantage in some of these industries (see Table 4). It is though arguable if the high-tech products produced in China are of a genuinely high-tech nature or it is just due to statistical classification. However, it is clear that China has become a formidable player in the high-tech industry. with ever increasing R&D expenditures and FDI in the high-tech sector, the determination of the government to support the sector, the large number of returnees who were educated in the West equipped with advanced knowledge, a highly developed infrastructure and efficient supply chains. Chinese firms are emerging on the world stage to give established MNEs a run for their money even in the high-tech sector. However, Chinese firms are not giving up their established position in the low-tech sector. Given China's immense geographical size and large regional variations in income levels (the Western China's level of economic development and income is substantially lower than the East), MNEs in China are moving production from the East to the West. In other words, China is not ready to vacate the space for inexpensive goods that it has occupied. Whilst firms move up the value chain in one part of China, in another part of China firms occupy the place that the firms that have moved up have vacated. It is important to recognise the heterogeneity of China's manufacturing sector.

Earlier we noted that the growth of China's manufacturing is due to labour reallocation from agriculture to industry and cheap labour. Another relevant factor related to labour is the C virtual absence of labour laws in China. Prior to economic reforms, legal contracts for labour were abolished on the premise that workers were the "masters of the nation", following China's ideology and the fact that most industrial workers worked for SOEs, and held permanent positions. However, with the diversification of firm ownership to include TVEs, foreign firms, private firms and collectively-owned firms, and the elimination of the "iron rice bowl", the Chinese government recognised that many workers were not under any legal protection and conflicts around workplace conditions became troublesome for many local governments. China introduced the first Labour Law in 1995. However, the law was widely regarded as narrowly focused, vague and overly simplified and compliance was spotty (Friedman and Lee, 2010). The law required all employers to sign labour contracts with their employees, but only about 50% of all enterprises did so and among the labour contracts that were signed, 60-70% were short-term contracts of under one year. Non-compliance was particularly significant in the private and foreign sectors and with migrant workers from rural areas. It wasn't until 2007, a new law was published as part of a new legislative structure which

included the Employment Promotion Law, the Law on Medication and Arbitration of Labour Disputes at the national level and a number of local regulations. Whilst we cannot discuss the legitimacy and rationale of these laws, we merely note that because of weak labour laws Chinese workers were working in an environment with low pay and low protection which means low costs for manufacturers. Chinese workers also faced the problems of long hours, absence overtime pay, wage arrears, health or social insurance, and discrimination (particularly one of gender), illegal dismissals and severe fines for common workplace errors (Friedman and Lee, 2010).

It may though be impractical for India to embark on the so called labour intensive exports led growth at the present juncture. China's export trade now consists of high-skill and technology-intensive manufactured goods (around 38.5% of total exports) and the low-skill and labour intensive goods such as toys and leather goods accounted for less than 10% in 2013. The mass markets for labour intensive goods in Asian countries and elsewhere that China dominated for long is now taken over by other Asian exporters such as Vietnam. What we see is a flying Geese formation with China being the lead goose, as it vacates the space for inexpensive goods it previously occupied and moves up the value chain other Asian countries occupy the space it vacates.

India is not amongst the flying geese, for reasons stated earlier. It never was a part of the formation. Primary commodities, precious stones and non-monetary gold remained to be an important part of trade, accounting for 47.4% of India's total exports in 2013. The share of labour intensive export oriented industries was only 8%. As noted above three of the relatively capital intensive industries Chemicals, Metals and Metal products, Machinery and transport equipment accounted for nearly 50% of a total output of Rs 27757 billion. These industries along with gems and jewellery and other technology intensive products account for more than 60% of exports of the country (Figure 5). Could it be argued the sort of goods that China is exporting now are the ones that also figure prominently in India's exports (see table 4)? Why can't India outperform China, the latecomer, in the export markets for these goods? Why are India's manufacturing industries much more capital intensive than that of China right across the board? Why can't India's organised manufacturing sector be the leading sector?

5. Patterns of Management and the Manufacturing Sector

The received wisdom for the less than expected contribution of the organised manufacturing sector to the economy is mainly twofold; the intricate pro-labour legislation in force to this day and the inward looking IS policies in force until the year 1991 when the protection afforded to industry was reduced substantially. The IS policies not only tilted the market determined factor price ratio in favour of capital as opposed to that of labour and away from the shadow rate of factor prices but also promoted inherently capital intensive industries. The intricate labour laws discussed at some length in the literature on the economy (Bhagwati and Panagariya, 2013) have no doubt contributed to the missing middle. The labour laws extend from the requirements to provide adequate and safe working conditions for labour, and a minimum wage to the strict rules and regulations against retrenchment and lay off of workers even by unprofitable firms facing forced to close down. In fact, empirical evidence on the issue of the impact of labour laws on the manufacturing sector for the period 1958-1992 suggests that states that were pro-labour as opposed to states that were pro-employer experienced reduced output employment and investment. In the pro-labour states labour legislation of various sorts imposed on the registered manufacturing sector appears to have increased output in the unregistered or the informal sector (Besley and Burgess, 2004) not subject to rigid labour laws. One other consequence of both the labour laws and the distorted factor prices is

the very low presence of middle sized firms that employ relatively large volumes of labour. These are the firms that are unable to cope with labour laws and various other distortions in the economy. The large firms that employ more than 500 labourers cope with the distortions by substituting capital for labour. The small firms that employ 5 to 9 people are not subject to the labour laws to the same degree as the large firms but their productive efficiency is low and so is their contribution to the total output of the sector.

In contrast, China's strategy during post-reform period has pretty much been pro-employer. On the aspect of labour and employment, China has faced two huge challenges. The first is the huge number of migration from agriculture to industry, i.e. from rural area to urban area, as mentioned earlier. The second is associated with the privatisation of SOEs and TVEs; millions of urban workers were laid off (Fan *et al.*, 2013). Thus from the societal perspective, the country needs to generate so many new job opportunities to accommodate the rural migrants and the laid off urban workers. Between 1978 and 2007, a de facto deregulation of employment security and wage fixing was instituted: employers were allowed to hire employees on a contractual basis; wages were more or less set based on market demand and supply; laid off workers were encouraged and supported to become self-employed or join in the private sector. In 2012, 50% of urban employment was in domestic private sector. It is also because of privatisation, additionally marketization, China has had a vibrant SME sector. In 2004, the last data available to include all enterprises in China, there was more than 1.37 million SMEs that employed 85% of labour. One unfortunate consequence of the deregulation is labour exploitation and labour unrest, which partially prompt the set of labour laws in 2007/8. That's, though China's growth may have benefited from its flexible labour market, China has also paid the costs for the labour problems, that has led the government to re-regulate the labour market.

Although there is some evidence that suggests that labour laws have a negative impact on employment, productivity of labour and poverty, it cannot be concluded that but for India's stringent labour laws its manufacturing sector would be on par with that of China in terms of employment and productive efficiency. The Besley-Burgess study is a carefully planned econometric study that identifies many of the problems in classifying India's states into pro-employer and pro-worker states. This classification is based mainly on the sort of amendments to the Industrial disputes act of 1947. Whether or not this is a realistic criterion for classifying states into pro-employer and pro-worker is open to question. States such as Gujarat and Maharashtra that are leading players in the manufacturing sector are classed as pro worker states. These are the states that are supposed to have experienced the adverse effects of labour legislation. Again states such as Kerala and Madhya Pradesh that are lower down the scale on manufacturing re classified as pro-employer states. This is not to say that labour laws have had no impact on the fortunes of the manufacturing sector, it is just that their impact may not be as severe as is suggested.

Again there is no denying that the IS policies of the past have had a heavy impact on the structure of India's manufacturing sector as said earlier. Whilst we do not take issue with these explanations for the relatively capital intensive nature of India's manufacturing sector and its relatively low contribution to growth and development of the economy ,we believe that there is yet another factor that has contributed to the present state of affairs. It is that the relatively capital intensive nature of India's manufacturing sector and the so called "missing middle" are both due to the sort of managerial know how the country possesses. Briefly put it is our contention that the top level managers in India's private sector are "market managers rather than "man managers". They are adept at identifying markets for the products their firms produce, locating sources of finance and raising finance and exploring ways and means of acquiring sources of technology and know how. They are not, however, adept at organising labour and managing engineering technology. Studies on

entrepreneurship classify entrepreneurship into two broad categories – necessity entrepreneurship and opportunity entrepreneurship (Koster and Rai, 2008). Necessity entrepreneurship comes into play when employment opportunities deteriorate and job seekers are forced to establish production facilities on their own. Opportunity entrepreneurship occurs when firms perceive opportunities for growth and explore ways and means of capturing new market. The observed capital intensity of Indian manufacturing firms in the organised sector relative to the firms in China (Table 2) illustrates. Indian managers that are not adept at management prefer capital intensive technologies that can be operated by skilled labour without much supervision. Business culture in India is oriented towards not only capital intensive techniques managed by skilled labour but also inherently capital intensive industries.

Business culture or managerial expertise and specialism is to be traced to several unique features of the Indian economy. Foremost of these is the inheritance from history. India has had a long history of business entrepreneurship marked by its caste and community orientation. Foremost amongst these groups are the Banias and the Marwaris, primarily merchants and money lenders with a prominent role in financing India's foreign trade during the British colonial era. Allied to the caste orientation of the managers was the group or family orientation of firms. These firms produce adiverse range of products but they all share risks, draw on a pool of finance and information. They were also traders in their own right. Another group of entrepreneurs were the Parsis who had no religious affiliation with the Hindu community and were on a class of their own, As Damodaran (2013) notes the Parsis had special relationship with the British

"being part of neither the Hindu nor Muslim mainstream, nursing no political ambition and exposed to commercial influences because of their proximity to the ports of Bharuch, Surat, and Daman, the Parsis seemed ideal for recruitment as native brokers, agents and shippers".

The managerial interests of the present day managers of Indian big firms reflect this inheritance of expertise in trade and finance. Three quarters of foreign acquisitions by Indian firms estimated at 1,347 during the period 2000-2008 are reported to be undertaken by business groups. It is noteworthy that acquisitions of existing firms rather than green field investments accounts for most of India's FDI in the developed countries. Indian mangers are better equipped to locate markets, cut costs and utilise existing technology effectively as opposed to establishing new firms with up to date technology and know how. Also noteworthy is their expertise in raising finance in international markets to acquire firms such as the Jaguar carmakers. These are also the groups such as the Tatas and the Ambanis that are at the helm of India's organised manufacturing sector. It is their expertise in trade, acquisitions and finance rather than managing large labour intensive firms that to an extent explains the orientation of Indian firms towards capital intensive and skilled labour intensive technologies.

Chinese firms too have ventured abroad and invested in African countries and in the EU and the US (http://www.heritage.org/research/reports/2011/07/Chinese-outward-investment-more-opportunity-than-danger). Their investments differ from that of the Indian firms and reflect their demand for energy, power and metals for use back in China.. In addition, the bulk of China's outward FDI (OFDI) was by the country's SOEs are known for their lack of managerial expertise. Deng (2004, p14) observes "(the) Chinese government has, to a great extent, played a critical role in shaping the structure of the country's approved outward investment". This involvement and shaping is often through SOEs. SOEs have been able to gain substantial monetary support from state-controlled banks. As such, in the early years of China's OFDI, the scene was dominated by SOEs. Partially as the result of SOE's shortage of managerial expertise, according to data from Heritage Foundation, "Transactions worth approximately $165 billion have been impaired or have failed since

the beginning of 2005. In contrast, it was not until 2003 that private firms were legally allowed to invest overseas. Different from the strategic behaviour of SOEs, private firms are increasingly operating in a free-market environment and are more likely to be influenced by market forces and to be commercially motivated (Liu et al., 2008; Ramasamya et al., 2012). However, they are very small in scale. Though the share of SOEs declined on a yearly basis, by 2011 it still accounted for 63% of China's OFDI stock. In contrast, private firms' share was only 1.7%.

Yet another piece of evidence that supports the observation that India's managers are adept at managing markets, finance and utilising skilled labour to organise production comes from the estimates of total productivity of Indian manufacturing firms and its decomposition into technological change and technical efficiency. Most studies including the one from which estimates of technical change and efficiency change cited below report a decline in total factor productivity (TFP) in India in the decade of the 1990s (Goldar, 2004), while for China it fluctuated between 1978 and 1995 and was no different from agriculture and service sector, but the TFP growth in manufacturing overtook other sectors and have been grown positively since 1995 (Tian and Yu, 2012).

To compare the two country's manufacturing TFP change, we have carried out our own analysis using DEA. A brief summary of data and methodology is presented in the Appendix. The results with respect to overall technical efficiency change, technical change, pure technical efficiency change, scale efficiency change and TFP change are reported in table 4. The value of greater than 1 indicates positive change. It is clear in most of the manufacturing sectors, China experienced positive progress in terms of all indicators while for India the opposite is true with exception of Beverages, Manufacture of Articles for Culture, Education and Sport Activities and Communication Equipment, Computers and Other Electronic Equipment. The mean values indicate that overall China experienced positive progress, while India retreated with the exception of technical change that shows a growth rate of 0.06%. We further divide the manufacturing sectors according to their technology level. According to OECD, we categorise sectors into high-tech, medium-high-tech, medium-low-tech and low-tech. The comparison between China and India reveals that, though China has potential in all industries, India performs better than China in high-tech industry.

Pressure on the Indian manufacturing firms to adjust to the new competitive environment explains the decline in TFP. The fact to note is that technical efficiency exceeds technical change in almost all the groups though TFP growth in total is not impressive. Efficiency change is notably high in skill intensive industries such as electronics, engineering and non-electrical machinery. The ICRIER study attributes the growth in technical efficiency mostly to investments in R&D. The composition of R&D and its precise impact on productivity is not clear. R&D in electronics is likely to be much different from that in textiles. Even so, it may be surmised that R&D and managerial efficiency are aligned. It is managers who decide on the sort of R&D to invest in, the size of the investments and the duration of investment. R&D could also include exploration of markets and sources of finance and advertising. All of this is the province of what we earlier referred to as opportunity entrepreneurship. Liberalisation of the economy that has promoted competition from national and international sources appears to have unleashed these managerial talents of Indian entrepreneurs. The growth of India's FDI in developed country markets in skill intensive sectors suggests as much.

The issue though is why has all this failed to promote the productive efficiency and exports of India's manufacturing firms on a larger scale on par with that of China. There are two possible explanations. One, it is a matter of time. Firms need time to adjust to the new situation of increased competition. Second, it appears to be the case that firms producing inputs are falling behind in coping with the

requirements of the final product producers. This surmise follows from the recent research that refers to the hallowing out of the Indian manufacturing sector. Hallowing out refers to the value added of firms that is less than the value of their total output. The high cost on locally produced inputs that mostly require engineering skills may be one reason for the growth in outward investment by Indian companies.

The experience of China contrasts with that of India in this respect. China's engineering oriented managerial skills coupled with imported know how provides the inputs required by the final producers. In fact, until recently production of inputs with the collaboration of foreign firms was the focal point of Chinese manufacturing. This is the so called outsourcing of input production to China by MNEs in the US and the EU. Now input producers are increasingly finding markets at home. This fact also accounts for the transition of Chinese firms from standardised products to specialist differentiated products (Rodrik, 2006).

Our hypothesis that India may not be able to imitate China in promoting labour intensive exports and development is based on several factors including the traditional explanations. India's managerial endowments and nature of education of its citizens are broadly different from that of China's managers and education patterns. These are the factors that explain the services orientation of India's economy and the capital intensive nature of its manufacturing sector. The issue then is what are the options available for India to cope with relatively high levels of unemployment and poverty.

6. What Can Be Done?

India is a rich country with a lot of poor people ,as a commentator put it ,aptly sums up the problem facing the policy makers. How best to use its riches of managerial talent, endowments of education ,a reputable software centred services sector, and an agricultural sector that has bestowed food self-sufficiency on the country. As said earlier, food self sufficiency hasn't provided the means to purchase food for nearly 25% of the population. There is though a highly encouraging development in the rural sector where 60% of the population continue to live for the reasons cited earlier. This is the growth of the non-farm rural sector. Available data suggests that the number of non-farm rural employment increased from 36.1 million workers in 1977-78 to as high as 71.52 millions in 1999-2000. Non-farm employment accounts for around 23.8% of total rural employment. Growth in employment during the reform period (1991 -2000) was only 1% but more than ninety per cent of the employment during this period was on account of rural non-farm employment. Growth in employment as a whole at 1% per annum was much lower than that during the pre-reform period. There is a suggestion that this growth in non-farm employment is a push factor meaning that those who cannot find lucrative jobs elsewhere end up in low paying jobs in the non-farm rural sector. This speculation is arguable. The non-farm agricultural jobs are in a number of sectors including construction, retail trade, transport services and manufacturing. Retail trade and manufacturing account for 65% of the jobs. These are sectors that offer relatively high wages and the demand for these jobs arises from the growth of the economy including agriculture. Those employed in these occupations are reported to earn 40%more than those in agriculture. The downside of these jobs though is that most of them may be casual jobs.

The presence and growth of the rural non-agricultural sector could be the propeller of growth and employment of the economy. They could be the Indian counterpart of the Chinese firms that have

provided jobs for those released from a productive agricultural sector, but with a major difference. Instead of the labourers moving to the urban areas, firms in the urban areas would move to the non-farm rural areas to strengthen the growing non-farm sector with finance and markets. The first stage of this policy should be investments by the state in infrastructure in the rural areas. In the second stage non- farm sector firms in the rural areas would be encouraged to produce differentiated products of the sort India is known for in textiles and clothing, leather products and various sorts of wooden products. These sort of handicrafts that are to be found in specialist shops in the urban areas could top the list of India's exports of textiles, clothing and other high quality products that have a market in the developed countries. India's software expertise could be of immense value to the producers of these products in promoting communication between the producers and the purchasers, organising finance and in the production of designs and advertising. The non-farm firms and establishments in the rural areas could be the counterparts of TVEs in China. The TVEs though they were owned by the government were managed and operated by salaried managers whose salaries and bonuses were related to the performance of the firm. Firms facing bankruptcy were not bailed out by the government. The state owned but privately operated firms contributed to exports and growth of the economy. Firms that are in operation in rural India could be developed on the same lines as the TVEs. The organised sector could outsource their input requirements to these firms. Thus tripartite operations consisting of non-farm rural firms, software experts and the organised sector firms could exploit India's comparative advantage in services, skilled managers and semi-skilled labour in rural areas. This strategy of taking industry to rural areas instead of the migration of rural labour to urban areas would work towards the utilisation of India's comparative advantage. This sort of a policy framework is very well expounded by the Late AM Khusro(Khusro., 2001) an eminent agricultural economist. In his words

"the idea is that instead of sending people to where infrastructure is , one should send infrastructure to where people are, ie in the rural areas….. This infrastructure will consist of electricity and water supply, sewerage, local roads, municipal facilities and few other things. So it is not a geographical shift of labour but a functional, sectorial shift that will generate the first round of employment and income" The second round according to Khusro is to invite industry and business to use the infrastructure and build shops, factories, workshops, offices, schools, hospitals and clinics. Industry loves infrastructure as Khusro puts it "industry loves infrastructure.. if you give them infrastructure, they will respond and move and may not even want tax holidays! All of this economic activity will of course generate incomes and demand for goods and services.

Yet another avenue of know how and markets for both agriculture and the rural industries would be the contribution foreign owned agro-business firms. The BJP government is not for foreign direct investment in retailing. Whilst a ban on FDI may be much better than the previous government's decision to allow more than 51% FDI in multi-brand retailing subject to a number of restrictions, the country may be deprived of know how from firms that both produce and market food products

7. Conclusions

This paper has provided a brief review of the structure, performance and policies towards the manufacturing sectors in India and China. It doubts if the often recommended policy prescription that India's sector should follow China's example and promote labour intensive manufactures production and exports would be either feasible or effective in India. This view is based on a comparison of the factors that have influenced the structure and policies in the two countries. It is though not entirely dismissive of the lessons China's successful policy framework has to offer. In

15

particular China's promotion of TVEs may be of significance to India in promoting the nascent non-agricultural rural enterprises.

Appendix: Measuring and Decomposing TFP

From a methodological perspective, there are many different approaches that can be used to examine TFP, e.g. stochastic frontier analysis (SFA) and data envelop analysis (DEA). However, given the small sample size, we do not have much choice but to use the non-parametric and deterministic DEA approach (Maudos *et al.*, 2002). Below we will briefly outline DEA here, readers are directed for detailed and technical discussions in Coelli *et al.* (2005) since we use their computer programme DEAP for estimation.

DEA uses a nonparametric linear programming for the development of production frontiers and the measurement of efficiency relative to the developed frontiers. The frontier for a sample of decision making units (DMUs) is constructed through a piecewise linear combination of actual input-output correspondence set that envelops the input-output correspondence of all DMUs in the sample. Each DMU is assigned an efficiency score that ranges between 0 and 1 with 1 indicating highest efficiency relative to the rest DMUs in the sample. From here we can estimate Malmquist indices of productivity change which can then be decomposed into technical change and efficiency change. The efficiency change can be further separated into scale efficiency change and pure technical efficiency change. To estimate the Malmquist indices of efficiency and TFP, a panel dataset on India and China between 2003-2007 is used with output measured by value added and inputs measured by employment and fixed capital formation.

Table 1 China and India; Basic Statistics

	China	India
Population, billion	1.35	1.24
Labour force, million	788	484
Age dependency ratio (% of working-age population)	36.36	52.97
Age dependency ratio, old (% of working-age population)	11.84	7.95
Age dependency ratio, young (% of working-age population)	24.52	45.02
Life expectancy	75.2	66.2
Secondary school enrolment rate	88.98	68.51 (2011)
Tertiary school enrolment rate	26.70	23.27 (2011)
GDP, PPP (constant 2011 international $, trillion)	14,549	6,245
GDP per capita, PPP (constant 2011 international $)	10,771	5,050
GDP growth rate (%)	7.8	4.7
GDP per capita growth rate (%)	7.3	3.4
Gini Coefficient	42.06 (2009)	33.9 (2010)
Poverty level at $1.25 a day (PPP) (%) (2011)	1.3	5.1
CO2 emissions (gt)	8.29	2.01
Corruption perceptions index (2014)	36	38
Global competitiveness index	4.83	4.32

Notes:

Data are for 2012 unless indicated otherwise.

All data are obtained from World Bank's World Development Indicators with the exception of the last two. Corruption perceptions index is from Transparency International (http://www.transparency.org). Global competitiveness index is from World Economic Forum (http://www.weforum.org/).

Corruption perceptions index is a composite index, drawing on corruption-related data from expert and business surveys carried out by a variety of independent and reputable institutions. Scores range from 0 (highly corrupt) to 100 (very clean).

Global competitiveness index comprises of 12 pillars: institution, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation. Scores range from 1 (least competitive) to 7 (most competitive).

Table 2: Capital Intensity of Manufacturing

		2003	2004	2005	2006	2007
Food Processing	Low-tech	2.17	2.10	1.96	1.81	1.82
Food Manufacturing	Low-tech	1.86	1.45	1.42	2.36	2.30
Beverages	Low-tech	2.10	1.45	**0.83**	**0.61**	1.09
Tobacco	Low-tech	4.50	3.93	3.85	4.04	3.33
Textile	Low-tech	1.46	1.31	1.42	1.33	2.01
Textile Wearing Apparel, Footware and Caps	Low-tech	**0.97**	**0.73**	**0.83**	**0.87**	**0.76**
Leather, Fur, Feather and Related Products	Low-tech	1.07	1.05	1.23	1.20	1.30
Timber, Manufacture of Wood, Bamboo, Rattan, Palm and Straw Products	Low-tech	1.63	**0.82**	2.08	1.16	2.05
Furniture	Low-tech	1.28	1.30	1.54	1.49	1.29
Paper and Paper Products	Low-tech	1.78	1.41	1.72	1.30	1.62
Printing, Reproduction of Recording Media	Low-tech	1.22	**0.86**	1.02	1.18	**0.60**
Manufacture of Articles For Culture, Education and Sport Activities	Low-tech	**0.68**	**0.72**	**0.72**	**0.72**	1.19
Rubber	Medium-low-tech	1.44	1.39	1.79	1.19	1.04
Plastics	Medium-low-tech	**0.85**	**0.98**	**0.99**	**0.83**	**0.71**
Non-metallic Mineral Products	Medium-low-tech	**0.74**	**0.80**	**0.65**	**0.52**	**0.68**
Smelting and Pressing of Metals	Medium-low-tech	1.58	1.16	1.43	1.71	1.09
Metal Products	Medium-low-tech	1.32	0.99	1.00	1.01	1.35
Raw Chemical Materials and Chemical Products	Medium-high-tech	**0.90**	1.02	1.03	**0.99**	1.08
Chemical Fibers	Medium-high-tech	1.94	1.78	2.94	3.01	2.81
General Purpose Machinery	Medium-high-tech	1.46	1.22	1.29	1.06	0.84
Special Purpose Machinery	Medium-high-tech	1.05	1.03	1.17	1.08	1.40
Transport Equipment	Medium-high-tech	1.00	**0.80**	**0.87**	1.05	1.48
Electrical Machinery and Equipment	Medium-high-tech	1.33	**0.89**	**0.87**	**0.83**	1.19
Communication Equipment, Computers and Other Electronic Equipment	High-tech	1.73	1.30	1.68	1.02	**0.73**

| Measuring Instruments and Machinery for Cultural Activity and Office Work | High-tech | 0.81 | 0.59 | 0.64 | 0.48 | 1.00 |

Notes:

Capital intensity here is measured by the share of non-wage value added in total value added. Figures presented in the table are the ratio of India's capital intensity to China's.

Data source: UNIDO Industrial Statistics Databases.

Manufacturing industry's classification by technology-intensity is based on OECD classification (http://www.oecd.org/sti/ind/48350231.pdf).

Table 3: Employment Share

	Employment in					
	Agriculture	Industry	Services	Agriculture	Industry	Services
	China			India		
1994	54.3	22.7	23.0	60.5	15.7	23.7
2000	50.0	22.5	27.5	59.9	16.0	24.0
2005	44.8	23.8	31.4	55.8	19.0	25.2
2010	36.7	28.7	34.6	51.1	22.4	26.6
2011	34.8	29.5	35.7	..	..	..
2012	..	..	..	47.2	24.7	28.1

Note: Data are obtained from World Bank's World Development Indicators.

Table 4: Malmquist Index (2003-2009)

Industry	Overall technical efficiency change	Technical change	Pure technical efficiency change	Scale efficiency change	TFP change	Overall technical efficiency change	Technical change	Pure technical efficiency change	Scale efficiency change	TFP change
			China					Indian		
Food Processing	1.004	1.001	1.003	1.002	1.005	0.997	0.999	0.996	1.001	0.997
Food Manufacturing	1.003	1.001	1.002	1.002	1.005	0.992	0.999	0.991	1.001	0.991
Beverages	1.003	1.003	1.001	1.002	1.006	1.003	1.002	1.001	1.002	1.005
Tobacco	1.007	1.002	1.000	1.007	1.010	1.000	0.996	1.000	1.000	0.996
Textile	1.005	1.001	1.001	1.003	1.006	0.994	0.999	0.994	1.000	0.993
Textile Wearing Apparel, Footware and Caps	1.003	1.000	1.001	1.002	1.003	0.994	1.000	0.994	1.000	0.994
Leather, Fur, Feather and Related Products	1.003	0.999	1.001	1.002	1.002	0.999	0.999	1.000	0.999	0.999
Timber, Manufacture of Wood, Bamboo, Rattan, Palm and Straw Products	1.006	1.001	1.005	1.001	1.007	0.991	1.001	0.992	0.999	0.992
Furniture	1.002	1.001	1.003	0.999	1.003	0.99	1.001	0.991	0.999	0.99
Paper and Paper Products	1.002	1.004	1.001	1.002	1.006	0.99	1.001	0.99	1.000	0.991
Printing, Reproduction of Recording Media	1.001	1.003	0.999	1.002	1.004	1.000	1.001	0.999	1.001	1.002
Manufacture of Articles For Culture, Education and Sport Activities	1.002	0.999	1.001	1.002	1.002	1.002	1.000	1.001	1.001	1.002
Rubber	1.001	1.002	1.001	1.001	1.003	0.994	1.000	0.993	1.002	0.995
Plastics	1.004	1.001	1.002	1.002	1.005	0.996	1.001	0.995	1.001	0.997
Non-metallic Mineral Products	1.005	1.001	1.001	1.004	1.006	0.997	1.000	0.999	0.998	0.996

Smelting and Pressing of Metals	1.005	1.000	1.000	1.005	1.005	0.991	1.001	0.990	1.001	0.992
Metal Products	1.004	1.000	1.003	1.001	1.004	0.994	1.000	0.995	0.998	0.993
Processing of Petroleum, Coking, Processing of Nuclear Fuel	1.000	1.004	0.999	1.001	1.004	1.000	1.005	1.000	1.000	1.005
Raw Chemical Materials and Chemical Products	1.005	1.002	1.000	1.004	1.007	0.994	1.000	0.995	0.999	0.993
Chemical Fibers	1.001	1.005	1.003	0.999	1.006	0.998	1.006	1.000	0.998	1.005
General Purpose Machinery	1.005	1.001	1.003	1.002	1.006	0.998	1.000	0.997	1.000	0.998
Special Purpose Machinery	1.006	1.001	1.003	1.003	1.006	0.993	1.000	0.993	1.000	0.993
Transport Equipment	1.002	1.000	0.999	1.002	1.002	0.990	1.000	0.991	0.999	0.991
Electrical Machinery and Equipment	1.004	1.001	1.002	1.001	1.005	0.994	1.000	0.995	0.999	0.993
Communication Equipment, Computers and Other Electronic Equipment	0.998	1.001	0.998	1.000	0.999	1.002	1.002	1.000	1.002	1.004
Measuring Instruments and Machinery for Cultural Activity and Office Work	1.003	0.999	1.001	1.001	1.002	0.998	1.002	1.000	0.998	0.999
Mean	1.0032	1.0013	1.0013	1.0020	1.0046	0.9958	1.0006	0.9958	0.9999	0.9964
High-tech industries	1.0005	1.0000	0.9995	1.0005	1.0005	1.0000	*1.0020*	*1.0000*	1.0000	*1.0015*
Medium-high-tech industries	1.0038	1.0017	1.0017	1.0018	1.0053	0.9945	1.0010	0.9952	0.9992	0.9955
Medium-low-tech industries	1.0032	1.0013	1.0010	1.0023	1.0045	0.9953	1.0012	0.9953	1.0000	0.9963
Low-tech industries	1.0034	1.0013	1.0015	1.0022	1.0049	0.9960	0.9998	0.9958	1.0003	0.9960

Note: Author's own calculation based on data from UNIDO Industrial Statistics Databases.

Table 4: India and China's leading export products, $ billion

India	Export	Share	China	Export	Share
Total	336.61	100	Total	2209.01	100
[334] Petroleum oils or bituminous minerals > 70 % oil	67.08	19.93	[764] Telecommunication equipment, n.e.s.; & parts, n.e.s.	204.46	9.26
[667] Pearls, precious & semi-precious stones	30.21	8.97	[752] Automatic data processing machines, n.e.s.	166.59	7.54
[897] Jewellery & articles of precious material., n.e.s.	11.04	3.28	[776] Cathode valves & tubes	117.05	5.30
[542] Medicaments (incl. veterinary medicaments)	10.84	3.22	[821] Furniture & parts	59.49	2.69
[042] Rice	8.17	2.43	[778] Electrical machinery & apparatus, n.e.s.	52.65	2.38
[651] Textile yarn	7.09	2.11	[851] Footwear	50.76	2.30
[781] Motor vehicles for the transport of persons	5.56	1.65	[845] Articles of apparel, of textile fabrics, n.e.s.	48.99	2.22
[845] Articles of apparel, of textile fabrics, n.e.s.	5.17	1.54	[897] Jewellery & articles of precious material., n.e.s.	45.15	2.04
[263] Cotton	4.67	1.39	[871] Optical instruments & apparatus, n.e.s.	39.13	1.77
[658] Made-up articles, of textile materials, n.e.s.	4.61	1.37	[894] Baby carriages, toys, games & sporting goods	38.53	1.74
[011] Meat of bovine animals, fresh, chilled or frozen	4.49	1.33	[759] Parts, accessories for machines of groups 751, 752	37.55	1.70
[842] Women's clothing, of textile fabrics	4.24	1.26	[772] Apparatus for electrical circuits; board, panels	36.53	1.65
[784] Parts & accessories of vehicles of 722, 781, 782, 783	4.18	1.24	[775] Household type equipment, electrical or not, n.e.s.	35.55	1.61
[792] Aircraft & associated equipment; spacecraft, etc.	4.15	1.23	[893] Articles, n.e.s., of plastics	35.30	1.60
[764] Telecommunication equipment, n.e.s.; & parts, n.e.s.	3.81	1.13	[844] Women's clothing, of textile, knitted or crocheted	34.63	1.57
[081] Feeding stuff for animals (no unmilled cereals)	3.70	1.10	[842] Women's clothing, of textile fabrics	29.39	1.33
[793] Ships, boats & floating structures	3.60	1.07	[793] Ships, boats & floating structures	28.68	1.30
[036] Crustaceans, mollusks and aquatic invertebrates	3.59	1.07	[771] Electric power machinery, and parts thereof	28.28	1.28
[699] Manufactures of base metal, n.e.s.	3.47	1.03	[831] Travel goods, handbags & similar containers	27.84	1.26
[292] Crude vegetable materials, n.e.s.	3.46	1.03	[658] Made-up articles, of textile materials, n.e.s.	26.48	1.20

Note: Author's own calculation based on data from http://unctadstat.unctad.org/wds

Table 5: RCA

	India					China				
	1995	2000	2005	2010	2013	1995	2000	2005	2010	2013
Primary commodities, precious stones and non-monetary gold (SITC 0 + 1 + 2 + 3 + 4 + 68 + 667+ 971)	1.71	1.58	1.52	1.48	1.40	0.68	0.51	0.30	0.21	0.18
Manufactured goods (SITC 5 to 8 less 667 and 68)	0.80	0.84	0.83	0.80	0.81	1.15	1.20	1.30	1.43	1.48
Chemical products (SITC 5)	0.88	1.14	1.08	0.96	1.09	0.66	0.54	0.44	0.50	0.51
Machinery and transport equipment (SITC 7)	0.20	0.18	0.28	0.43	0.43	0.56	0.81	1.23	1.47	1.47
Electronic excluding parts and components (SITC 751 + 752 + 761 + 762 + 763 + 775)	0.10	0.06	0.08	0.09	0.08	1.24	1.85	3.53	3.65	3.47
Parts and components for electrical and electronic goods (SITC 759 + 764 + 772 +776)	0.14	0.08	0.10	0.25	0.22	0.62	0.88	1.59	1.82	2.08
Iron and steel (SITC 67)	0.99	1.40	1.75	1.72	1.55	1.16	0.79	0.83	0.89	1.01
Textile fibres, yarn, fabrics and clothing (SITC 26 + 65 + 84)	3.84	4.42	3.39	2.85	2.72	3.70	3.43	2.96	2.99	2.88
Manufactured goods by degree of manufacturing	0.80	0.84	0.83	0.80	0.81	1.15	1.20	1.30	1.43	1.48
Labour-intensive and resource-intensive manufactures	2.59	2.88	2.19	1.64	1.60	2.91	2.79	2.45	2.59	2.61
Low-skill and technology-intensive manufactures	0.91	1.18	1.37	1.33	1.25	1.54	1.61	1.37	1.54	1.51
Medium-skill and technology-intensive manufactures	0.27	0.27	0.40	0.49	0.48	0.62	0.80	0.81	0.99	1.05
Medium-skill: Electronics (excluding parts and components) (SITC 775)	0.06	0.10	0.17	0.13	0.13	1.52	2.69	2.79	2.95	2.99
Medium-skill: Parts and components for electrical and electronic goods (SITC 772)	0.22	0.19	0.31	0.63	0.41	0.84	0.90	1.08	1.28	1.23

High-skill and technology-intensive manufactures	0.45	0.49	0.60	0.65	0.71	0.73	0.87	1.32	1.39	1.46
High-skill: Electronics (excluding parts and components) (SITC 751 + 752 + 761 + 762 + 763)	0.11	0.05	0.07	0.08	0.07	1.19	1.75	3.64	3.76	3.56
High-skill: Parts and components for electrical and electronic goods (SITC 759 + 764 + 776)	0.13	0.06	0.07	0.18	0.19	0.59	0.88	1.67	1.91	2.23
Services	0.90	1.65	2.13	2.08	1.80	0.54	0.51	0.40	0.40	0.37
Transport	0.98	0.86	1.05	1.13	1.04	0.37	0.27	0.37	0.41	0.35
Travel	1.05	1.09	1.11	1.05	0.87	0.76	0.87	0.57	0.47	0.37
Other services	0.73	2.43	3.15	2.73	2.43	0.48	0.39	0.31	0.37	0.38

Note: Author's own calculation based on data from http://unctadstat.unctad.org/wds

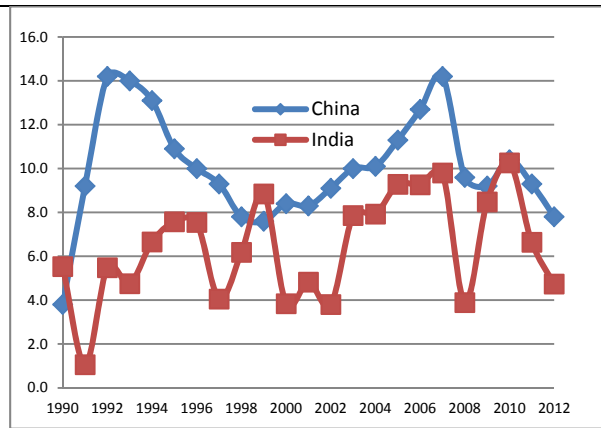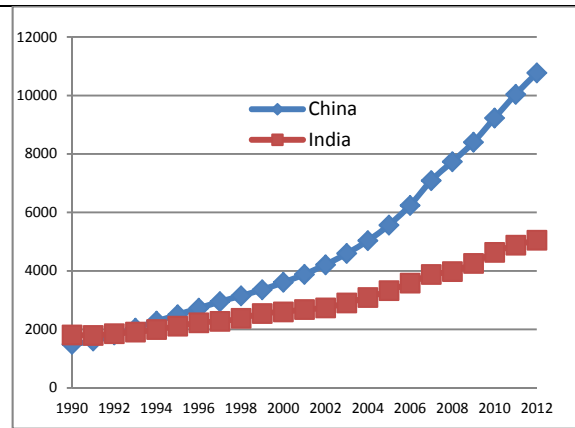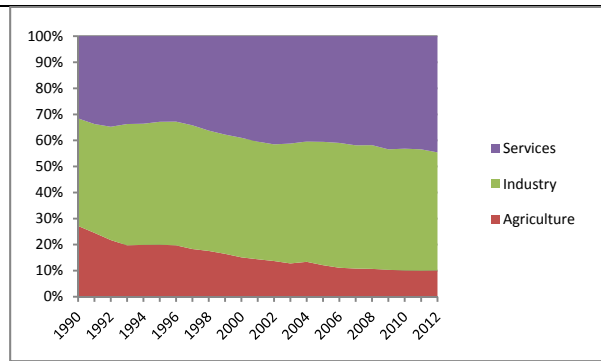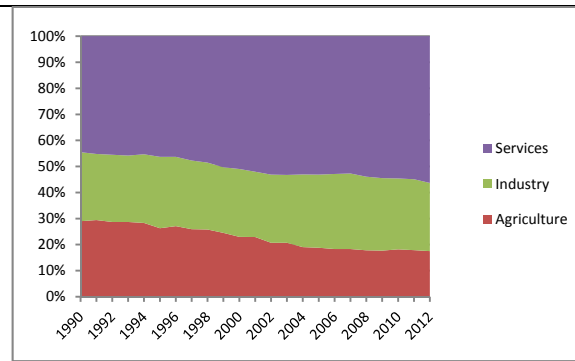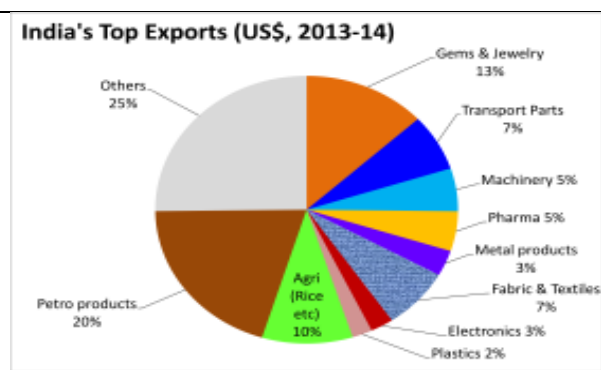| Figure 1: GDP growth, India and China, 1990-2012	Figure 2: GDP per capita, PPP (constant 2011 international $), India and China, 1990-2012
Figure 3: GDP composition, China, 1990-2012	Figure 4: GDP composition, India, 1990-2012
Figure 5: India's Top Exports	

Data source: World Development Indicators

References:

Ashok, D. (2001). in (Balasubramanyam, V. N. Ed.) *Conversations with Indian Economists*, Bsingstoke: Palgrave.

Besley, T. and R. Burgess (2000). 'Land Reform, Poverty Reduction, and Growth: Evidence from India', *The Quarterly Journal of Economics*, vol. **115**(**2**), pp. 389-430.

Besley, T. and R. Burgess (2004). 'Can Labor Regulation Hinder Economic Performance? Evidence from India', *The Quarterly Journal of Economics*, vol. **119**(**1**), pp. 91-134.

Bhagwati, J. and P. Desai (1970). *India: Planning for Industrialisation*, London: Oxford University Press.

Bhagwati, J. and A. Panagariya (2013). *Why Growth Matters: How Economic Growth in India Reduced Poverty and the Lessons for Other Developing Countries*, New York: Public Affairs.

Bhagwati, J. and T. Srinivasan (1975). *Foreign Trade Regimes and Economic Development: India*, New York: National Bureau of Economic Research.

Coelli, T. J., D. S. P. Rao, C. J. O'Donnell and G. E. Battese (2005). *An Introduction to Efficiency and Productivity Analysis*: Springer Science & Business Media.

Damodaran, H. (2013). *India's New Capitalists: Caste, Business and Industry in a Modern Nation*, Basingstoke: Palgrave Macmillan.

Deng, P. (2004). 'Outward Investment by Chinese MNCs: Motivations and Implications', *Business Horizons*, vol. **47**(**3**), pp. 8-16.

Deokar, B. K. and S. L. Shetty (2014). *Growth in Indian Agriculture*.

Eichengreen, B. and P. Gupta (2011). 'The Service Sector as India's Road to Economic Growth', *National Bureau of Economic Research Working Paper Series*, vol. **No. 16757**.

Fan, S., R. Kanbur, S.-J. Wei and X. Zhang (2013). 'The Economics of China: Successes and Challenges', *NBER Working Paper No. 19648*.

Friedman, E. and C. K. Lee (2010). 'Remaking the world of Chinese labour: A 30-Year retrospective', *British Journal of Industrial Relations*, vol. **48**(**3**), pp. 507-533.

Fu, X. and V. N. Balasubramanyam (2005). 'Exports, foreign direct investment and employment: The case of China', *World Economy*, vol. **28**(**4**), pp. 607-625.

Gaulier, G., F. Lemoine and D. Ünal-Kesenci (2007). 'China's integration in East Asia: Production sharing, FDI & high-tech trade', *Economic Change and Restructuring*, vol. **40**(**1-2**), pp. 27-63.

Goldar, B. (2004). *Indian Manufacturing: Productivity Trends in Pre- and Post-Reform Periods*.

Hu, Z. F. and M. S. Khan (1997). 'Why is China growing so fast?', *Staff Papers - International Monetary Fund*, vol. **44**(**1**), pp. 103-131.

Huang, Y. (2002). *Selling China: Foreign Direct Investment During the Reform Era* Cambridge: Cambridge University Press.

Huang, Y. and X. Meng (1997). 'China's industrial growth and efficiency: A comparison between the state and the TVE sectors', *Journal of the Asia Pacific Economy*, vol. **2**(**1**), pp. 101-121.

Kanamori, T. and Z. Zhao (2004). 'Private Sector Development in the People's Republic of China', *Asian Development Bank Institute: Tokyo*, vol. **Working Paper No.27**.

Kannan, K. P. and G. Raveendran (2009). 'Growth Sans Employment: A Quarter Century of Jobless Growth in India's Organised Manufacturing', *Economic and Political Weekly*, vol. **44**(**10**), pp. 80-91.

Khanna, T. and Y. Huang (2003). 'Can India overtake China?', *Foregin Policy*, vol. **July/August**.

Koster, S. and S. K. Rai (2008). 'Entrepreneurship and Economic Development in a Developing Country: A Case Study of India', *Journal of Entrepreneurship*, vol. **17**(**2**), pp. 117-137.

Khusro A M (2001) "Khusro", in V N Balasubramanyam , Conversations with Indian Economists, Op cit Pp72-73

Lin, J. Y. (1992). 'Rural reforms and agricultural growth in China', *American Economic Review*, vol. **82**(**1**), pp. 34-51.

Lin, J. Y. (2011). 'China and the global economy', *China Economic Journal*, vol. **4**(**1**), pp. 1-14.

Liu, K., K. Daly and M. E. Varua (2014). 'Analysing China's foreign direct investment in manufacturing from a high–low technology perspective', *Emerging Markets Review*, vol. **21**(**0**), pp. 82-95.

Liu, X., W. Xiao and X. Huang (2008). 'Bounded Entrepreneurship and Internationalisation of Indigenous Chinese Private-Owned Firms', *International Business Review*, vol. **17**(**4**), pp. 488-508.

Maudos, J. n., J. M. Pastor, F. Pérez and J. Quesada (2002). 'Cost and profit efficiency in European banks', *Journal of International Financial Markets, Institutions and Money*, vol. **12**(**1**), pp. 33-58.

Mazumdar, D. and S. Sarkar (2013). *Manufacturing Enterprise in Asia: Size Structure and Economic Growth*, London and New York: Routledge.

Panagariya, A. (2008). 'What India must do to modernise', *Vox*, vol. **http://www.voxeu.org/article/why-india-lags-behind-china**.

Ramasamya, B., M. Yeung and S. Laforet (2012). 'China's Outward Foreign Direct Investment: Location Choice and Firm Ownership', *Journal of World Business*, vol. **47**(**1**), pp. 17-25.

Rodrik, D. (2006). 'What's So Special about China's Exports?', *China & World Economy*, vol. **14**(**5**), pp. 1-19.

Sachs, J. D. and W. T. Woo (2001). 'Understanding China's economic performance', *Journal of Policy Reform*, vol. **4**(**1**), pp. 1-50.

Song, Z., K. Storesletten and F. Zilibotti (2011). 'Growing Like China', *The American Economic Review*, vol. **101**(**1**), pp. 196-233.

Steinfeld, E. S. (2004). 'Market Visions: The Interplay of Ideas and Institutions in Chinese Financial Restructuring', *Political Studies*, vol. **52**(**4**), pp. 643-663.

Taebe, F. A. (2003). 'Title', Danish Research Unit For Industrial Dynamics.

Tian, X. and X. Yu (2012). 'The enigmas of TFP in China: A meta-analysis', *China Economic Review*, vol. **23**(**2**), pp. 396-414.

Tirthankar, R. (2011). *The Economic History of India, 1857-1900*, Delhi: Oxford University Press India.

Upadhya, C. (2004). 'A New Transnational Capitalist Class? Capital Flows, Business Networks and Entrepreneurs in the Indian Software Industry', *Economic and Political Weekly*, vol. **39**(**48**), pp. 5141-5151.

Vaidyanathan, A. (1988). *India's Agricultural Development in a Regional Perspective*, Hyderabad: Orient Longman.

Vaidyanathan, A. (1996). 'Agricultural Development: Imperatives of Institutional Reform', *Economic and Political Weekly*, vol. **31**(**35/37**), pp. 2451-2458.

Vaidyanathan, A. (2000). 'India's Agricultural Development Policy', *Economic and Political Weekly*, vol. **35**(**20**), pp. 1735-1741.

Varshney, A. (1998). *Democracy, Development, and the Countryside: Urban-Rural Struggles in India*, Cambridge: Cambridge University Press.

Wang, X. and S. Rungsuriyawiboon (2010). 'Agricultural efficiency, technical change and productivity in China', *Post-Communist Economies*, vol. **22**(**2**), pp. 207-227.

Wei, Y. (2004). 'Foreign direct investment in China', in (Wei, Y. and V. N> Balasubramanyam Eds.), *Foreign Direct Investment: Six Country Case Studies*, Cheltenham: Edward Elgar.

Weitzman, M. L. and C. Xu (1994). 'Chinese township-village enterprises as vaguely defined cooperatives', *Journal of Comparative Economics*, vol. **18**(**2**), pp. 121-145.

Yu, H. (2013). 'The Ascendency of State-owned Enterprises in China: development, controversy and problems', *Journal of Contemporary China*, vol. **23**(**85**), pp. 161-182.

---

[i] The so called Kuznets phenomenon or paradigm follows from the assumption that as growth occurs urban incomes increase, rural incomes may stay put or decrease, wage costs to urban industries decrease because of increased agricultural productivity and low prices of food and the mobility of labour from rural to urban areas. At first with growth in urban incomes increase and income inequalities increase but as growth progresses income tend towards equality also with increased incomes demand for services increase. This the so called inverted U curve of income inequality attributed to Kuznets.