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**Structural Change in India and China:
External Sustainability and the Middle-Income Trap**

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This paper focuses on the different development strategies of China and India, particularly regarding the role of manufacturing and services, for long-run productivity growth, external competitiveness and financial fragility. The findings appear to support the argument that productivity improvements in manufacturing drive productivity improvements in other sectors. They also substantiate previous findings that the Indian services-led growth trajectory has had limited success in transferring surplus labor from agriculture to other sectors. Furthermore, the trajectories have affected the export performances of the two countries with the Indian trade balance and current account revealing persistent deficits, compared to China's surpluses. The paper also argues that the way in which India has sought to sustain these deficits entails elements of financial fragility, and that the Chinese struggles with the internationalization of the renminbi also imply a possibility of financial instability.

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India and China have been lionized in the international press as two of the developing economies that will take over the world economy in the twenty-first century.³The rapid rates of economic growth that the two countries have experienced over the last three decades have been central to these optimistic predictions. This growth performance has attracted special attention because India and China are among two of the largest economies in the developing world, accounting for one-third of the total world population and two-thirds of the world's poor (Aziz 2008). In particular, the growth of China is seen with apprehension in the advanced or central economies. Niall Ferguson (2011: 9) said, for example, that "the key to China's dominance during the 21st century ultimately lies in the decline of the West."

Previous studies have shown that despite similarities in terms of rapid growth rates, there are major differences in the growth trajectories of the two economies (e.g., Mukherji 2005, Bosworth and Collins 2008, Herd and Dougherty 2007 and Bhattacharyay and Bhattacharyay 2016). In China, the industrial and manufacturing sectors have been the leading sectors whereas in India, the services sector has been the driver of growth. Some of these studies have decomposed the sources of growth and patterns of investment in the two countries. However, they have not focused on the implications of the services versus manufacturing-led growth trajectories for long-run productivity growth, external competitiveness and financial fragility.

This paper focuses on these specific issues, and the broader implications suggested by the Indian and Chinese experience for other developing countries. The evidence appears to support the argument that productivity improvements in manufacturing drive productivity improvements in other sectors, and that manufacturing matters. In other words, what a country produces and exports is central for development, something emphasized by structuralist authors and rediscovered more recently in the development literature (Hausmann and Hidalgo, 2011; Felipe et al., 2014). The evidence also substantiates previous findings that the Indian services-led growth trajectory has had limited success in transferring

³ The term developing countries has for the most part been abandoned and official documents and the press often refer to Emerging Market Economies (EME), without any discussion of the reason behind the changes, and the consequences of uncritically accepting the new terminology. For a discussion with the confines of the law see Salacuse (1999).

surplus labor from agriculture to other sectors, with more than half of the labor force continuing to be concentrated in agriculture where productivity remains very low.⁴ As against this, notwithstanding continuing problems of quality employment generation and income inequalities in China, the emergence of industry as the leading sector means that China has been more successful at transferring labor from agriculture to industry, one of the traditional engines of economic growth and higher productivity as discussed long ago by Arthur Lewis.

Furthermore, the different growth trajectories have had an impact on the export performances of the two countries with the Indian trade balance and current account revealing persistent deficits, compared to China's surpluses, which might however start dwindling under pressure in the new era of trade wars and protectionism. The paper argues that the way in which India has sought to sustain these deficits entails elements of financial fragility, and that the Chinese struggles with the internationalization of the yuan (or renminbi) also imply a possibility of financial instability.

The rest of the paper is organized as follows. To provide a context to the contribution of this paper, Section 2 evaluates the existing literature on the comparative development of India and China. Section 3 presents the major trends in terms of GDP growth, sectoral compositions of output and employment, productivity performance and public investment in the two countries. Section 4 analyzes the implications of the two growth trajectories for long-run productivity growth, external competitiveness and financial fragility in the two countries. Section 5 presents the conclusions, and the implications for policy and development strategies suggested by the Indian and Chinese experience.

The Comparative Development of China and India

The rapid economic growth of China and India over the last three decades has sparked off significant interest in comparisons of their growth and development experience. The literature has compared economic policies, financial factors, the importance of exports, sectors driving economic growth and

⁴ For an analysis of productivity growth in the agricultural sector, see Nabar-Bhaduri (2011 and 2012).

the sustainability of rapid economic growth in terms of certain demand and supply-side factors.

With respect to economic policies, studies note that till the late 1970s for China and the early 1990s for India, the State played a major role in organizing economic activity, and there was an emphasis on import substitution for achieving a certain degree of self-reliance (Mukherji, 2005; Prime, 2009; Bhattacharyay and Bhattacharyay 2016). Movements towards economic reforms in China began in 1978 under the leadership of Deng Xiaoping, as economic successes came to be seen as vital to the political survival of the Chinese Communist Party following the Cultural Revolution period. There was an increased willingness to experiment with market forces in a gradual and cautious manner (Nolan, 2012 and 2014). The late 1970s and early 1980s witnessed the opening up of the Chinese economy to foreign investment and a gradual transfer of the management and ownership of State-Owned Enterprises (SOEs) to private entities. Privatization has been selective, with large enterprises in strategic industries remaining state-owned, while small and medium-sized enterprises have been removed from state control.⁵The purpose of such selective privatization has been to nurture large firms in strategic industries and make them globally competitive (Mukherji, 2005; Nolan, 2012 and 2014). This is a far cry from simplistic notions of the primacy of property rights, often emphasized in the New Institutional literature (e.g. Acemoglu and Robinson, 2012).

Unlike China where political factors were central to the initiation of economic reforms, studies note that the main factor triggering reforms in India was the 1991 balance of payments (BOP) crisis, with the government on the verge of defaulting on its external debt.⁶Reforms included abolishing the industrial licensing regime, reducing tariff rates and quantitative import restrictions, and relaxing restrictions on

⁵ The strategic industries include telecoms, oil and chemicals, aerospace, military and related equipment, construction, and electricity generation and distribution among others. For the complete list, see Nolan(2014).

⁶ Sporadic and minor liberalization measures, involving the relaxation of some import controls and licensing requirements, were introduced in India in the early years after independence, and in the late 1970s. The mid-1980s witnessed more pronounced measures to liberalize the trade and industrial regime, some of which provided the basis for the large-scale reforms initiated in 1991 (Panagariya, 2003). Nevertheless, the mid-1980s initiatives were far more limited in their scope than those that were introduced in 1991, and the State continued to play a prominent role in industrial allocation.

capital flows and foreign exchange (Mukherji, 2005; Bhattacharyay and Bhattacharyay 2016). The removal of the industrial licensing regime paved the way for increased private participation in activities that were previously dominated by the public sector such as telecommunications, energy, mining, airlines and finance. Mukherji (2005) notes that unlike China, the political checks that arise from a participatory democracy have meant that privatization has been on a smaller scale in India. He also notes that while China has emphasized retaining state ownership of large strategic firms, post-reform economic policy in India has emphasized reserving the production of certain consumer goods for small firms with a view to promoting employment generating growth.

While studies reveal that trade and exports of both countries have grown with their increased global integration, the magnitudes have been greater for China than India.⁷ Moreover, the composition of the exports have been very different, with Chinese exports being dominated by manufactured goods and Indian exports being dominated by services, specifically information technology (IT) services and business processing services, in particular data management and call centers (Mukherji, 2005; Bosworth and Collins, 2008; Prime, 2009; Bhattacharyay and Bhattacharyay, 2016).

Some of the comparative literature has also focused on the financial sectors of the two economies. In a firm-level study using data from the World Business Environment Survey (WBES), Huang (2006) found that while firms in both countries reported financing constraints, the types of constraints were different. In China, the size of the firm was the main constraint, with lending by the financial sector being biased towards large enterprises. Some of this bias may reflect the policy preferences of the government in terms of developing globally competitive large enterprises in strategic industries, and the fact that the banking system is fundamentally state-controlled.

⁷For China, from 22 percent in 1980, the share of trade in GDP rose to 59 percent by 2011, while the share of exports amounted to around one-third of GDP in 2011. In India, the share of trade in GDP rose from 15 percent in 1980 to 54 percent by 2011, while the share of exports amounted to around one-fifth of GDP in 2011 (Prime, 2009; Bhattacharyay and Bhattacharyay, 2016).

In other words, a policy of National Champions seems to be one of the driving forces in the Chinese development strategy (Hemphill and White, 2013). In India, the main financing constraint arose due to the underdeveloped nature of the risk assessment abilities of financial institutions. Furthermore, the level of non-performing loans in China has tended to be higher than in India, suggesting greater financial fragility in the Chinese banking system, even though it must be emphasized that this refers to debt accumulated in domestic currency, something that is considerably less risky than in foreign currency. Similar conclusions about the greater financial fragility in China have been made in Saez (2004), Swamy (2006) and Aziz (2008).⁸

Finally, some studies have focused on decomposing the supply and demand-side sources of growth in the two countries, and have also shown that industry has been the leading sector in China, while services has been the leading sector in India (Bosworth and Collins, 2007; Herd and Dougherty, 2007; Felipe, Fan and Laviña, 2008). Bosworth and Collins (2007) and Herd and Dougherty (2007) use a growth accounting approach which focuses on supply-side factors. Felipe et al. (2008) use an income and expenditure approach that emphasizes the role of capital accumulation from both the demand (investment is an important component of aggregate demand) and the supply-side (capital is a factor of production). One common finding of these three studies is that higher investment rates and, hence, faster capital accumulation have been central to the more rapid growth performance of China in terms of per capita income and labor productivity.⁹

⁸ Some authors have emphasized the role of shadow banking and the possibility that it would lead to the Minsky type financial fragility. Huang (2017: 16) argues that: "the Chinese government is in a good position to indirectly regulate shadow banking transactions through the formal banking sector." This view might take a narrow definition of shadow banking. Gabor (2018) argues convincingly that the celebratory view of market-based finance might cloud the ability of Chinese authorities to regulate financial innovations, and that the risk in China is greater than often understood. While admitting that this is true, we remain confident on the ability of a central bank to act as a lender of the last resort in its own currency. The issue of whether debt is denominated in domestic or foreign currency is then central to understanding financial fragility.

⁹ Note that while public investment is indeed autonomous and is a source of demand-led growth, most evidence on private investment suggests that it follows the accelerator principle and is, as a result, induced demand, being the result of economic growth and not its cause. For recent estimates of accelerator coefficients for a large group of countries see IMF (2015).

With respect to growth sustainability, Herd and Dougherty (2007) suggest that China may face growth constraints in the long-run due to the effects of demographic changes (a decline in the share of the population in the working age group) on the savings and investment rates. In India, favorable demographic factors in terms of a growing share of population in the working age group and a decline in the dependency ratio, along with a growth in retained earnings in private and public enterprises suggest that it would be able to achieve and sustain higher rates of growth over the next two decades. This follows the conventional literature on the so-called demographic transition, which suggests that it was central for the so-called economic miracles in Asia (Bloom and Williamson, 1998). In the same vein, it is presumed that an eventual graying of the population, with an increase in the dependency ratio may lead to what has been termed as a middle-income trap (Eichengreen et al., 2012). The story builds on the conventional Solow or neoclassical supply-side model of growth, in which savings drive investment, and savings are tied to demographic factors.¹⁰

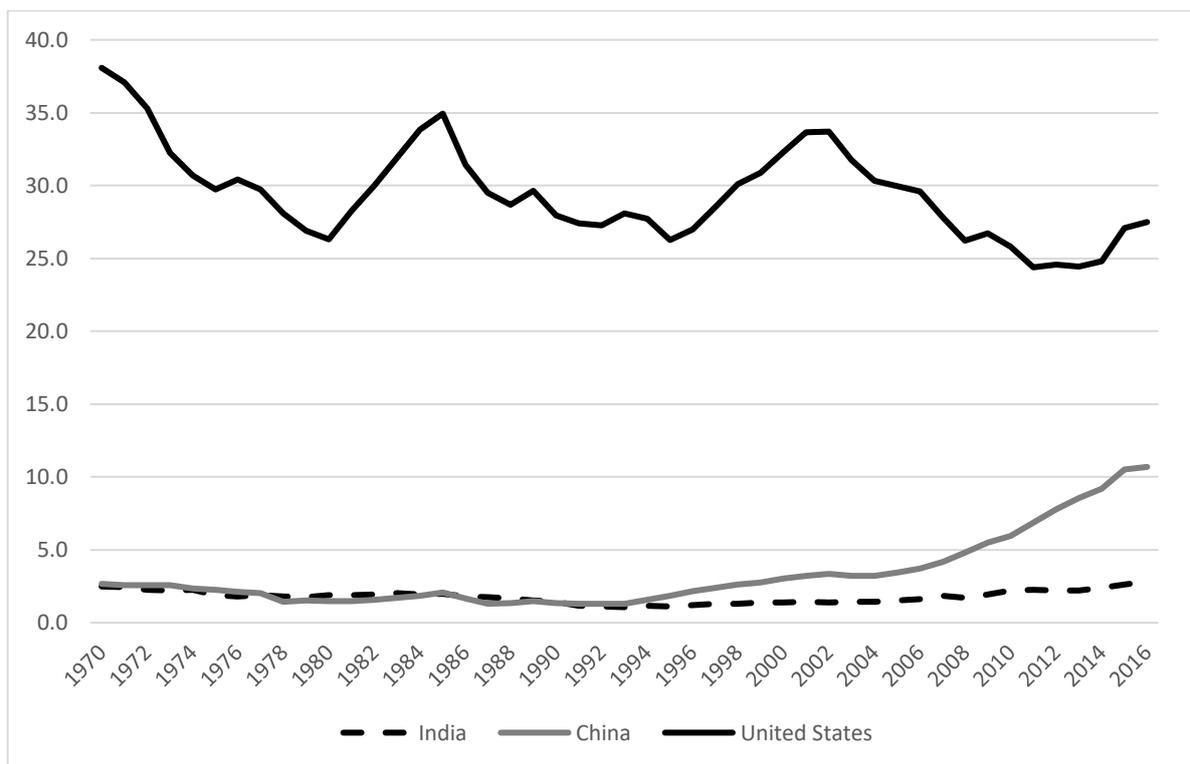
In contrast, Felipe et al. (2008) argue that China could face a constraint to future growth due to a declining productivity of capital. They emphasize that while greater urbanization in China has created a demand for capital-intensive physical infrastructure, the resulting pace of industrialization has created an excess supply of infrastructure, housing and consumer goods. This has caused the productivity of capital to decline over the last two decades, which in turn has caused the rate of profit to fall. A falling rate of profit is likely to deter future investment demand and, hence, capital accumulation and economic growth.

While Felipe et al. (2008) provide a contrast with the conventional literature, emphasizing the role of demand in the process of economic growth, growth is driven by investment which, in turn, follows the rate of profit. As noted above, the empirical evidence seems to suggest that private investment follows an accelerator mechanism, and that the

¹⁰ While Eichengreen (2011) argues that the demographic transition plays a significant role in the middle-income trap, the argument suggests that the bulk of the slowdown in economic growth should be seen in a fall in productivity. The suggestion is similar to the one put forward by Gordon (2016) for advanced economies, and relies on the slower pace of innovation associated with the information technologies of the third industrial revolution as compared to the previous two.

capacity generating effect of investment is driven by a need to adjust the supply side to the autonomous non-capacity generating elements of demand. In that sense, not only public investment, and exports, but also autonomous consumption are central elements of demand-led stories of economic growth.¹¹ This opens the question about the possibilities of growth associated with the expansion of mass consumption in domestic markets in both economies, a potential not fully realized. Shares of global consumption remain small, in particular in India, with significant expansion in China, more markedly after the global financial crisis, as seen in Figure 1. Chinese consumption now represents around 11 percent of global consumption, while Indian consumption is less than 3 percent, and the United States, which shows a fluctuating, but declining trend is still at a very high level, considering its share of global population, at about 27 percent of global consumption.

Figure 1 - Percent Share of World Consumption



¹¹This literature is based on the so-called supermultiplier model, which puts emphasis on the role of autonomous, non-capacity generating demand in promoting economic growth. For recent surveys of the literature see Smith (2012) and Freitas and Serrano (2015).

Source: World Development Indicators (WDI) database of the World Bank, China Statistical Yearbooks (various years) and authors' calculations.

In addition, another aspect of the comparative growth performance of both countries that appears to be missing from the present comparative literature is a closer focus on the implications of the services versus manufacturing-led growth trajectories for long-run productivity growth, external competitiveness and external financial fragility in the two countries. This paper focuses on these three aspects more closely.

It also focuses on the potential implications for development strategies suggested by the Chinese and Indian experiences. These questions are particularly relevant because the Indian experience in which services has emerged as the leading sector before industry at a relatively early stage of development has raised the issue of whether this trajectory provides an alternative development strategy for other developing countries. However, services-led growth has a limited ability to contribute to long-run productivity growth and the generation of quality employment on a large scale, and cannot serve as a substitute to a strategy emphasizing the growth of the manufacturing sector (Nabar-Bhaduri and Vernengo, 2012). In addition, growth that is overly dependent on external markets, as has been in the case in China till recently, and on capital flows to sustain persistent current account deficits, as has been the case in India, must eventually reach limits imposed by the balance of payments constraint.

It should be noted that similar arguments appear to be supported by analyses focusing on industrialized countries like the United States (e.g. Cohen and Zysman, 1987; Uchitelle, 2017).¹² These contributions have emphasized that

¹²The discussion of the role of manufacturing in Asia, particularly, China has gone hand in hand with the analysis of the flip side effect, the deindustrialization in the center (Rodrik, 2016) and other parts of the periphery (Palma, 2008). However, one should note some limitations of the literature on deindustrialization. Analyses that rely just on the size of the manufacturing sector, by output or employment, might miss central elements of manufacturing dynamism. In many ways, for example, the process of deindustrialization in the United States, does not represent a relative decline of the global dominance of its manufacturing sector. Block (2008) argues that the United States has a hidden developmental state that promotes manufacturing innovation, and that might be part of the explanation for why deindustrialization has not hurt American manufacturing dynamism.

services are a complement to manufacturing, and without a dynamic manufacturing sector, the growth and creation of employment in the services sector cannot be sustained.

Growth Rates, Sectoral Contributions, Labor Productivity and Public Investment

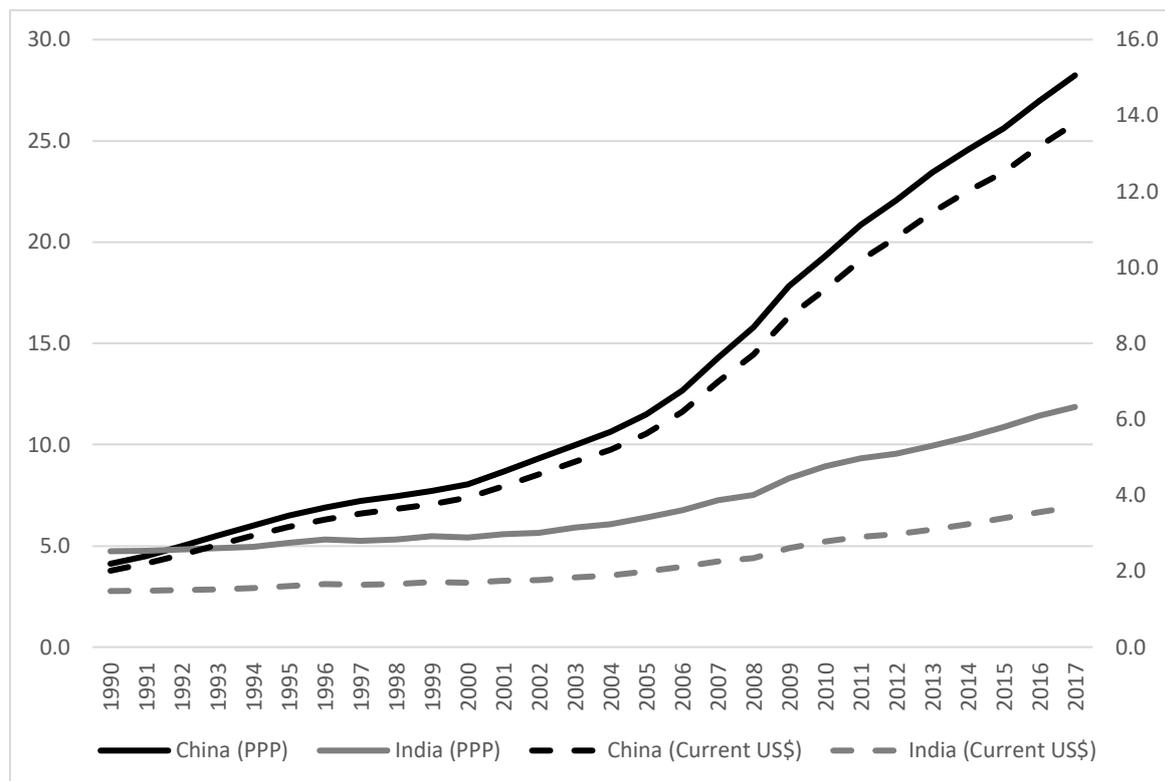
To provide an overview of the key economic aspects of the two countries and a context to the analysis of the following section, this section compares the real GDP and per capita growth, sectoral compositions of output and employment, labor productivity and public investment in China and India. Table 1 reports average growth rates for India and China over two longer periods 1952-80 and 1980-2010, associated broadly with the Golden Age of capitalism and with the Neoliberal Era. We also provide the comparison for each decade from 1980.

Table 1: Average Rates of Growth of Real and Per Capita GDP in China and India				
Period	Real GDP		GDP Per Capita	
	China	India	China	India
1952-80	6.7	3.6	4.7	1.4
1980-2010	10.2	6.2	9.1	4.3
1980-90	9.2	5.5	7.6	3.3
1990-2000	9.9	5.8	8.8	3.9
2000-10	10.7	7.2	10.1	5.6
2010-17	8.4	7.3	7.9	5.9
Source: The Conference Board Total Economy Database, and authors' calculations				

In both countries, the thirty-year period from 1980 to 2010 reveals an acceleration in the growth of real GDP and GDP per capita compared to 1952-80, in contrast to what is typical in both central countries and other parts of the periphery.

The growth rates of both variables have been greater for China than for India, with the difference being particularly noticeable with respect to GDP per capita. From an average growth rate of 6.7 per cent during 1952-80, real GDP growth increased to 10.2 per cent per year during 1980-2010 in China, while in India the average growth rate increased from 3.6 per cent to 6.2 per cent. However, it is important to note that growth seems to be decelerating in China.

Figure 2 - GDP per capita PPP vs. Current (% of US)



Source: World Development Indicators (WDI) database of the World Bank, China Statistical Yearbooks (various years) and authors' calculations.

Also, it should be clear that, while there is a significantly faster convergence towards United States levels of income per capita, particularly in China, this process is markedly less strong when measured in current dollars (left side scale) rather than in Purchasing Power Party (PPP) (right side bar in Figure 2). While there are good reasons to use PPP for comparisons of well-being, for issues related to development, which involve, the actual ability to purchase goods and services, the current figure provides a more accurate picture. Chinese GDP per capita is less than 14

percent of the United States, while the Indian figure remains below 4 percent.

For China, the 1980s captures the period when it embarked on economic reforms in a cautious and gradual manner, with the State retaining ownership of large SOEs in strategic industries with a view to making these SOEs globally competitive, and spending heavily on public investment. This growth continued in the 1990s and 2000s, with a large part of this growth being driven by a sharp rise in manufactured exports, facilitated by the export orientation of foreign firms based in China and the integration of China with East Asian production networks, and its symbiotic relation with the United States, a central market for its manufacturing exports that led some authors to coin the term Chimerica (Ferguson and Shularik, 2009).

The adverse effects of the 2007-09 Great Recession and the Eurozone crisis of the following year on Chinese manufactured exports, and the bursting of the real estate and stock market bubbles in 2015 have caused the growth rate to slightly decelerate during the 2010s, although it remains high at 8.4 percent.¹³ The additional stress of the trade wars with the United States might imply that the potential for growth associated with an export-led strategy is gradually being reduced. China will have to rely more on its domestic market, and create alternative networks for international expansion, something already being explored in both the Belt and Road Initiative (BRI), and the Chinese leadership in South-led financial institutions like the Asian Infrastructure Investment Bank and New Development Bank, the so-called bank of the BRICS.

Table 1 also indicates that in India, the growth rate accelerated in the 1980s, a decade prior to the initiation of economic liberalization in 1991, with the country growing at a rate of 5.5 percent over 1980-90. Moreover, this acceleration was more pronounced relative to the liberalization decade of the 1990s when the Indian economy grew at 5.8 percent. The acceleration of the 1980s reflected the expansionary

¹³ Some economists (e.g., Ghosh, 2015) have argued that both bubbles were the outcome of policy responses to a sharp fall in Chinese manufactured exports to advanced economies during the 2008-09 crisis, that had driven China's rapid economic growth till then. Note that growth is still high, for international standards, even with deceleration. In part, this reflects the fact that growth already was, and still is, to a great extent driven by public investment.

macroeconomic policies of the 1980s; a significant increase in the investment-GDP ratio from the late 1970s, driven to some extent by a significant increase in public investment; and that went hand in hand with some trade liberalization and industrial deregulation during the late 1970s and early 1980s.

Additionally, various social and institutional factors vital to the successful functioning of an economy (a system of higher education, entrepreneurial talent, science and technology development, and the development of the capital goods sector) which Indian policy-makers had been emphasizing since independence were more established by the 1980s (Nayyar 2006). The second decade (2000-10) post-liberalization reveals a greater acceleration relative to the 1990s, with an average growth rate of 7.2 percent, with some of this growth being driven by the surge in services exports.

Table 2: Sectoral Composition of Output (percentage share in total output)

	China				India			
	Agriculture	Industry	Manufac.	Services	Agriculture	Industry	Manufac.	Services
1952-60	71.3	6.0	3.5	22.7	55.6	18.6	10.3	25.1
1960-70	60.7	14.0	8.1	25.3	46.9	23.4	12.6	28.7
1970-80	48.1	27.9	17.0	24.0	41.6	25.6	13.9	32.6
1980-90	35.5	32.7	20.4	31.9	35.0	27.8	15.5	36.7
1990-00	22.9	41.8	29.8	35.2	28.1	30.3	17.5	41.5
2000-10	12.7	49.3	35.5	38.0	19.7	30.1	17.2	50.0
2010-17*	8.9	42.9	30.3	48.2	16.6	27.9	15.4	47.3

Source: Timmer, et al. (2015), World Bank Development Indicators, and authors' own calculations.

* Numbers might not be directly comparable with the ones directly above in the table.

Table 2 shows the sectoral composition of output in China and India. As has historically been the case in the development process of many countries, the share of the agricultural sector in total output has shown a decrease in both countries over time. For China, the contribution of the agricultural sector decreased from 71 percent of GDP during

the 1950s to 8.9 percent of GDP in the 2010s. In the case of India, it has fallen from around 56 percent to 16.6 percent over the same period.

However, the two countries reveal different trends with respect to the relative contributions of industry and services to GDP. In India in the decade right after independence, industry accounted for around 19 percent of total output, impressive for a country in the early stages of development, and the manufacturing sector accounted for around 10.3 percent of total GDP. These figures were higher relative to those for China, where the industrial sector contributed only 6 percent of total GDP, while the manufacturing sector accounted for 3.5 percent. These differences between the two countries show a marked change in subsequent decades, with the share of industry in China showing a meteoric rise to 49 percent of GDP during the 2000s, making it account for the largest share in GDP, before falling to almost 43 percent in the last decade. The share of manufacturing has also increased by nearly ten-fold to account for 35.5 percent of GDP in the 2000s, before falling to 30.3 percent of GDP in the 2010s. On the other hand, in India, the contributions of industry and manufacturing in subsequent decades have risen much less rapidly with industry accounting for 30 per cent and manufacturing for 17 per cent of GDP in the 2000s, before falling somewhat in the last decade.

The contribution of the services sector in China has increased from around 23 percent in the 1950s to 38 percent in the 2000s, and to 48.2 percent in the 2010s, in a pattern in which for a while industry was the dominant sector. As against this, in India, services have emerged as the sector accounting for the largest share in GDP, with the contribution of this sector doubling from 25 percent in the 1950s to about 50 percent in the 2000s, without a period of manufacturing dominance, and with the persistence of a relatively large share of agriculture in GDP.

Table 3 shows the sectoral composition of employment in the two countries. During the 1960s, the agricultural sector absorbed the majority of the workforce in both China and India. While the percentage of the persons employed in agriculture has shown a downward trend in both countries over time, the agricultural sector still accounts for a significant share of total employment, standing at around 20 percent in China and 45 percent in India in the 2010s. The employment

share of the industrial sector was lower at 9.4 percent in China compared to 12 percent in India during the 1960s, but has increased over the subsequent decades and accounted for almost 28 percent of total employment during the 2010s. In India, the share of the industrial sector in employment has increased less rapidly over the last five decades and stood at around 24 percent in the 2010s. But the differences are not large in industry.

Table 3: Sectoral Composition of Employment (percentage share in total employment)

	China				India			
	Agriculture	Industry	Manufac.	Services	Agriculture	Industry	Manufac.	Services
1960-70	79.8	9.4	7.2	10.8	71.5	12.0	9.8	16.5
1970-80	75.7	14	10.7	10.3	72.3	11.3	9.4	16.4
1980-90	63.5	20.3	14.7	16.1	69.6	11.9	9.8	18.4
1990-2000	53.8	22.6	15.2	23.6	63.3	14.8	10.6	21.8
2000-10	44.4	24.5	16.4	31.1	56.4	18.7	11.9	24.9
2010-17*	20.8	28.1	NA	51.1	45.5	23.8	NA	30.6

Source: See Table 2.

*These numbers are from the ILO from the WDI data bank and might overestimate the decrease in agricultural employment and the increase in service employment, as compared to the previous numbers in the table.

Yet, while the employment share of the services sector has shown an increase over the decades in both countries, the increase appears to be more rapid in China, which has pursued a more conventional manufacturing development strategy, rather than India with the service-led approach. This suggests, somewhat surprisingly that the increase in employment in services is more efficient when manufacturing develops faster. Note that the result suggests that the conventional Lewis story of the transition from agriculture to manufacturing goes hand in hand with urbanization and the increases of employment in services. In that sense, low productivity agricultural jobs have been the solution to the inability to incorporate workers in the modern sector in India (Nabar-Bhaduri, 2015).

Thus, in terms of the output, while services has emerged as the leading sector in both countries, it did so in a more conventional way in China, with industry taking the lead and

promoting the process of urbanization. In terms of employment, agriculture continues to account for a significant share of total employment in both countries remaining a cushion for low productivity employment, though this share has declined more in China. The fact that more than 45 percent of total employment in India remains in agriculture appears to provide further support for findings of previous studies such as Rakshit (2009) regarding the smaller employment elasticity of the services sector. So, despite services emerging as the leading sector in India, the ability to transfer labor from agriculture to services has been more limited. As against this, the faster expansion of the industrial and manufacturing sectors in China may explain why the decrease in the concentration of employment in agriculture has been greater compared to India. This also suggests the limitations of a services-led development strategy.

Table 4: Average growth of labor productivity per person employed in India and China, 1950-2017		
Average Labor Productivity Growth		
	China	India
1952-60	6.5	2.5
1960-70	1.8	2.9
1970-80	5.1	0.4
1980-90	4.9	3.3
1990-2000	7.5	4
2000-10	10.1	5.8
2010-17	8.1	5.7

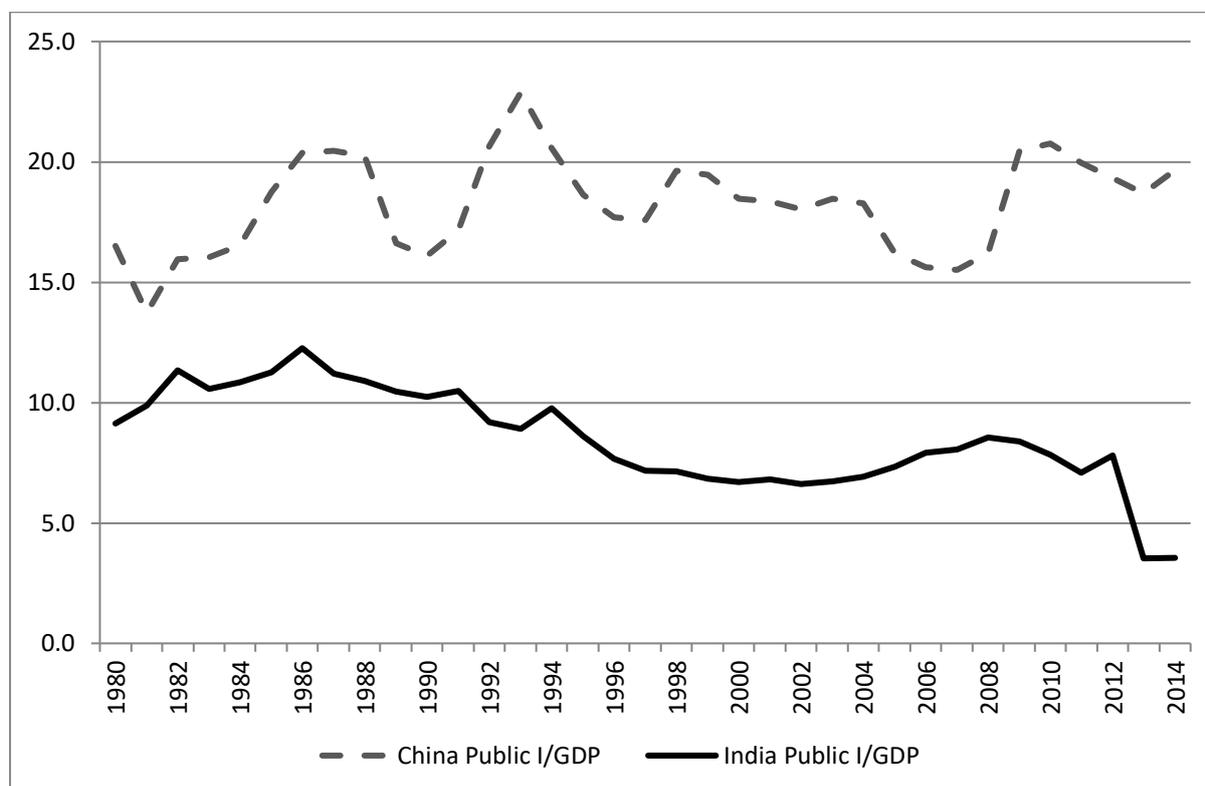
Source: See Table 1

Table 4 shows the average growth of labor productivity per person employed in China and India over time. Barring the 1960s, productivity has grown faster in China in each decade, even though India's productivity growth is impressive. The question to examine is to what extent the differences in the growth trajectories of the two countries can help to explain the differences in their labor productivity performance. In particular, the role of public investment seems to be crucial.

Figure 3 shows public investment as a percentage of GDP in India and China over the period from 1980 to 2014. The magnitude of public investment in China (relative to GDP) has been almost double that of India. For the period under consideration, public investment in China has generally been in the range of 15 to 20 percent of GDP. In India, the figure

was a little more than 10 percent of GDP in the 1980s, but has fallen and remained below 10 per cent of GDP since the 1990s, the decade in which India embarked upon economic liberalization.

Figure 3 - Public Investment (% GDP)



Source: World Development Indicators (WDI) database of the World Bank, China Statistical Yearbooks (various years) and authors' calculations.

This contrasts with the case of China, where public investment increased during the 1980s, the decade in which the Chinese leadership embarked upon economic liberalization in a cautious manner, while adopting deliberate policies to develop globally competitive large national companies. While the mid-2000s revealed a slight downward trend in this ratio with China adopting more pronounced liberalization measures, it reversed during 2008-10 in the wake of the global economic recession as China stepped up investment spending in the face of the slowdown in its manufactured exports. In India, the downward trend in public investment becomes more pronounced in the late 1990s, and continues into the early part of the 2000s, with the rise of disinvestment by the government from various public sector enterprises. This is also the period that coincides with the acceleration in the growth of the

services sector in India. The declining trend in the public investment ratio shows a marginal reversal in the latter half of the 2000s, but has subsequently again fallen to less than 5 percent of the GDP since 2013.

These trends in public investment highlight another important distinguishing aspect of the recent growth strategies of China and India. The higher public investment ratios for China show that the public sector has figured more prominently in China's manufacturing-led growth strategy. However, in India, the declining public investment ratio since the 1990s points towards the greater role played by the private sector in its services-led growth trajectory. This is all the more important in the context of the rediscovery of neo-mercantilist policies and the shrinking space for export-led development strategies, with important consequences for external sustainability.

Implications of the growth trajectories for long-run productivity growth and external accounts

Most analysis of economic growth suggests that Total Factor Productivity (TFP) is the main driver of economic growth, rather than emphasizing labor productivity.¹⁴ A few studies have focused on Kaldor's first law for India and China. Kaldor (1966) asserted that there exists a strong positive relation between the growth of manufacturing output and the growth of GDP. The expansion of industrial production makes it possible to draw labor from sectors having open or disguised unemployment, and also provides advantages associated with increasing returns (economies of scale, learning-by-doing, external economies in production, etc.), which are not available in the agricultural sector.

The expansion of the industrial sector then creates a demand for services, which also spurs growth in the services sector. For India, Dasgupta and Singh (2006) find evidence supporting Kaldor's first law at the state level, while Roy (2013) and Sankaran and Samantaraya (2015) respectively find evidence of causality running from services growth to GDP growth, and from GDP growth to industrial growth. In the case

¹⁴ On the limitations of the TFP literature see Felipe and McCombie (2013). In particular, it is essential to note that TFP might not be a measure of productivity.

of China, Hansen and Zhang (1996) and Jeon (2006) find evidence supporting Kaldor's first law.

Kaldor also focused on the relationship between manufacturing productivity growth and the growth of manufacturing output, which has come to be known as Kaldor's second law. The second law asserts that manufacturing productivity growth is positively related with the growth of the manufacturing sector, and presumably can be extended for the economy as a whole. That builds on previous work by Verdoorn (1949), and is known in the literature as Kaldor-Verdoorn's Law.

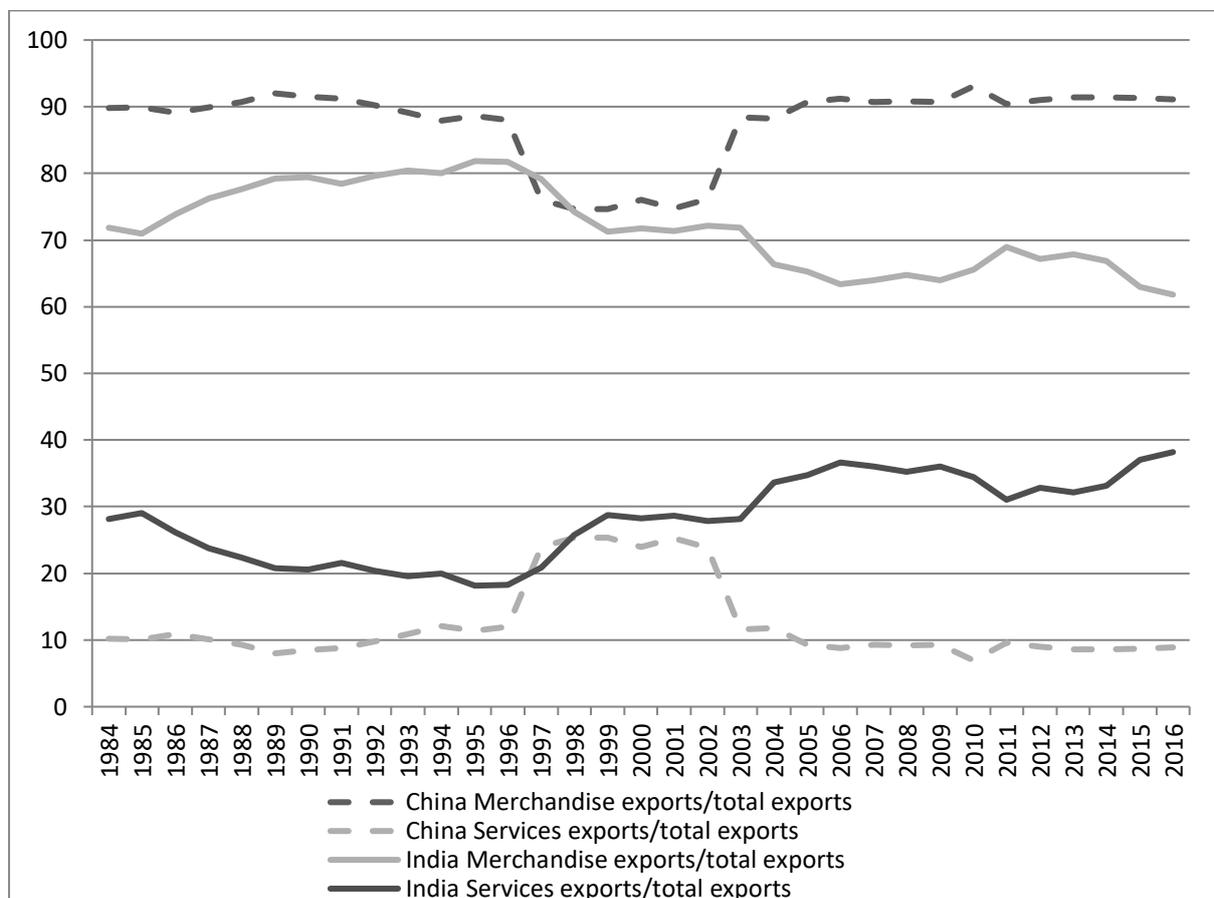
Verdoorn's law, which is a generalization of Kaldor's second law asserts that aggregate productivity growth is positively related with the growth of overall output. Verdoorn's law therefore captures the structural effect on productivity growth. The cyclical influence on productivity growth can be captured by Okun's law, which says that if an economy grows above its potential growth rate, unemployment will decrease, but less than proportionately to the excess of output growth over the potential growth rate. This is because productivity growth is pro-cyclical.

The results from our estimation for both countries are similar, thus, suggesting that the estimated Verdoorn and Okun coefficients are robust (see Appendix for estimation), and indicate relatively large Kaldor-Verdoorn effects of almost one to one increase in productivity associated to growth expansion. If the Kaldor-Verdoorn story holds, then conventional views that suggest that a slowdown and the possibility of a middle-income trap for developing countries is associated with an exogenous decrease in productivity seem implausible. One would have to look into other areas to understand the possibility of a growth slowdown. It seems clear that for many developing economies the balance of payments constitutes the main constraint on economic growth. One way of looking at both countries' comparative problems is to look at their export performance, and how the manufacturing versus services-led strategies cope with the external constraint.

Figure 4 shows the shares of services to goods exports and merchandise to total exports for the two countries, and includes the period after China's entry into the World Trade Organization (WTO). In China, merchandise exports have dominated total exports, accounting for around 90 percent of

total exports for the most part of this period, barring a brief period in the late-1990s and early 2000s. In the case of India, while merchandise exports also accounted for the larger share in total exports, this share has shown a downward trend since the late 1990s, and in the period shown, the service sector takes the lead. Since 2004, the average share of merchandise exports has been around 65 percent. The share of services exports has exceeded 30 percent of goods exports for most of the 2000s.

Figure 4 - Service and Merchandise Exports (% Goods Exports)

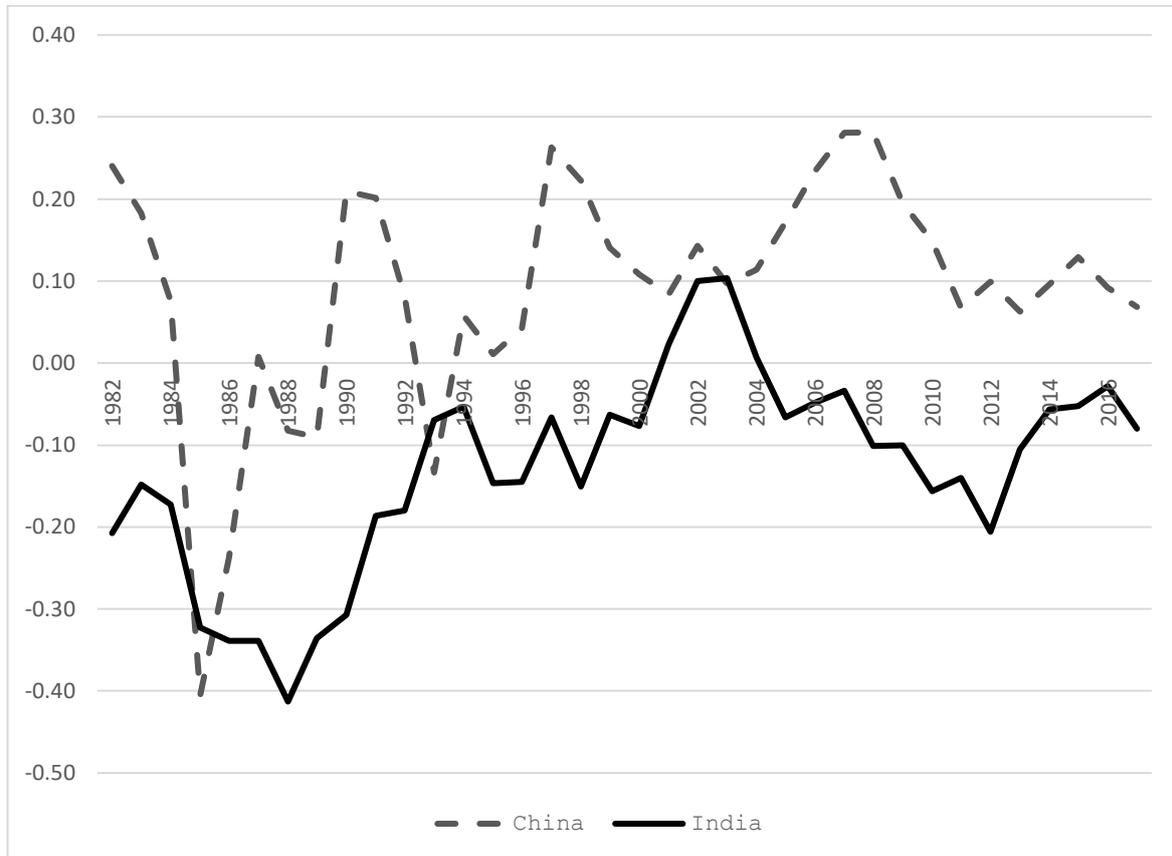


Source: World Development Indicators (WDI) database of the World Bank and authors' calculations.

An examination of the external accounts of the two countries reveals striking differences in their external performance and competitiveness. As Figure 5 shows, the Chinese current account has been in persistent surpluses since the 1990s, whereas the Indian current account has been in

persistently in deficit, with the exception of the early 2000s.

Figure 5 - Current Account (% Goods Exports)

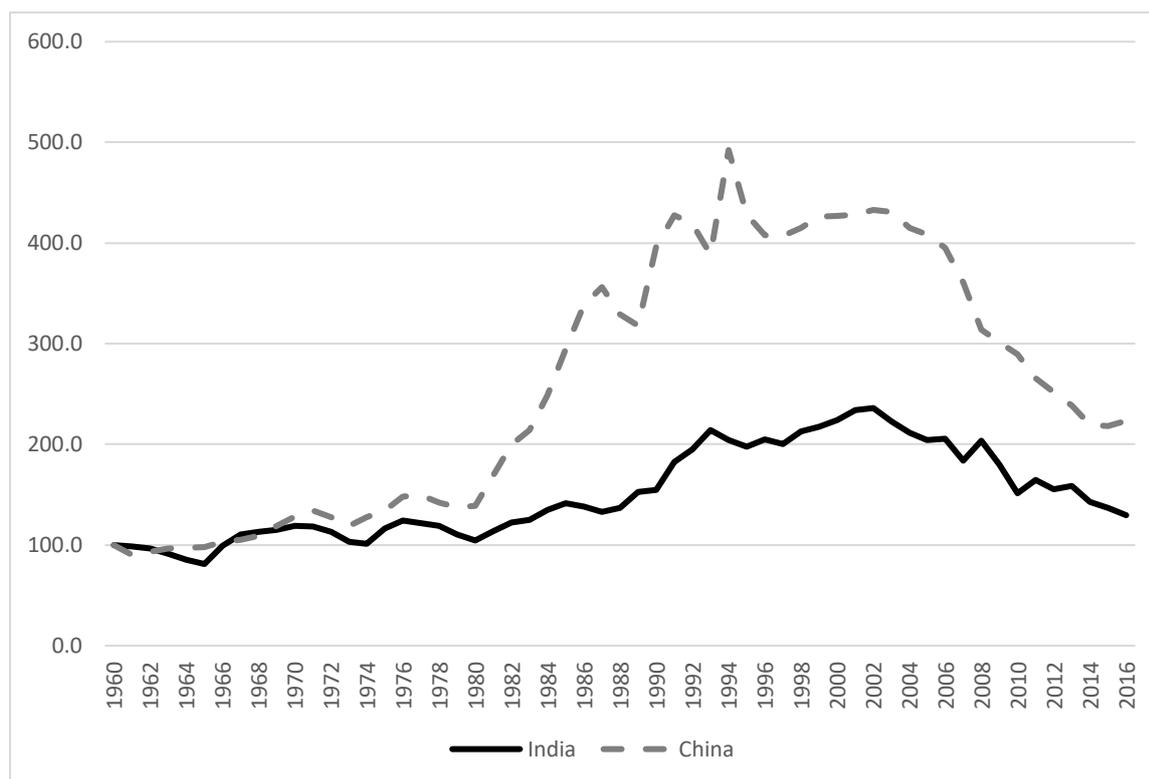


Source: World Development Indicators (WDI) database of the World Bank and author's calculations.

The Chinese surpluses reflect a combination of factors. One factor is the growing integration of China into East Asian regional production networks, or Global Value Chains (GVCs), especially in the case of consumer electronics exports, and the prominence of foreign firms in Chinese exports. Firms that are headquartered in the US and European Union (EU) have tended to export intermediate goods from more advanced Asian economies to their Chinese affiliates. These intermediate goods are assembled into final goods in China and are then exported mainly to the US and EU countries (Tong and Zheng, 2008). Also, while China has certainly inserted itself in the GVCs, it is clear that it also pursues policies associated with promoting national champions, as in previous experiences of developmental states (Wade, 2016).

Some authors have also emphasized the effects of a pegged exchange rate regime that has helped to keep the yuan or renminbi undervalued, while others suggest that high levels of domestic savings, and lower domestic consumption have contributed to the trade and current account surpluses in China (e.g. Makin, 2007; Song, Storesletten and Zilibotti, 2011). However, there are reasons to be skeptical about the role of the exchange rate in the successful upgrading of the Chinese productive structure and the export basket.¹⁵ Note, while low real wages and a significant real depreciation of the currency in the early phases of liberalization might have played an important role in the initial growth process, the rapid rate of real wage growth in China, and higher inflation, has implied a significant appreciation of the real exchange rate, and that is true for most of the 2000s (Figure 6).

Figure 6- Real Exchange Rate (1960 = 100)



Source: International Financial Statistics (IFS) database of the International Monetary Fund and author's calculations.

¹⁵Both Gereffi (2009) and Felipe et al. (2010a) argue that industrial policies were central to the upgrading of the productive structure in China.

In the case of Indian deficits, Nabar-Bhaduri (2018) has shown that the Indian trade deficits are a manifestation of a dependence on the imports of intermediate goods (both oil and non-oil), a rising import content of exports and a narrow export basket that has also mainly consisted of intermediate manufactured goods. The narrow composition of the export basket particularly with respect to manufactured exports has to some extent been the outcome of specific challenges that have arisen in the post-liberalization era such as reduced bank lending to the Indian commercial sector, the disappearance of development financial institutions, an underdeveloped private bonds market, persistence of inadequate infrastructure, antidumping measures and non-tariff barriers for industrial products in other countries, and the bias of the Indian government's fiscal concessions towards services.¹⁶

These persistent deficits have meant that India has relied on capital inflows to offset the trade deficits and sustain the current account deficit. An analysis of the composition of these capital inflows highlights elements of financial fragility entailed by these trade and current account deficits, and India's broader services-led trajectory. It is worthwhile analyzing the composition of Indian capital inflows. While other investment inflows accounted for the largest share during most of the 1990s, during the 2000s, the composition of capital inflows shifted towards Foreign Direct Investment (FDI) and portfolio investment, with the combined shares of these two categories surpassing the other investment category.

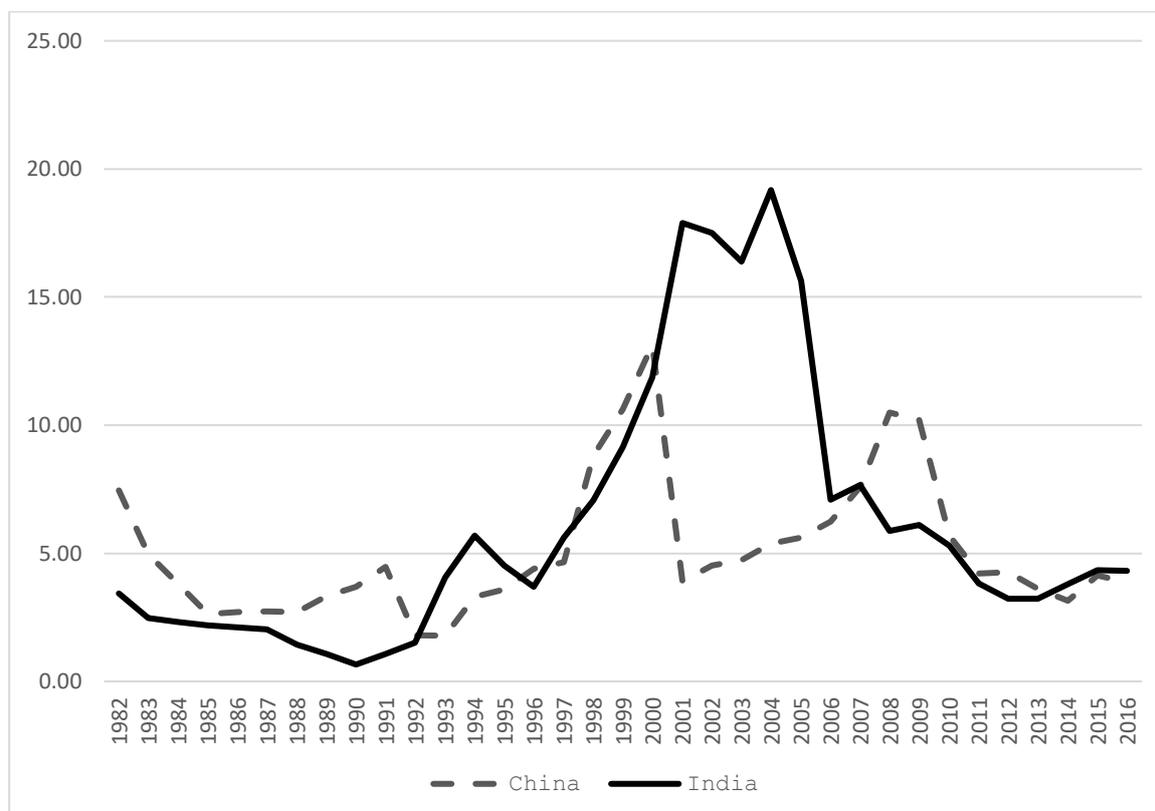
In several years in the 2000s, the share of portfolio inflows exceeded FDI inflows. The share of other investment inflows remained significant at more than 30 percent of total capital inflows in the 2000s, and post-2010, the share of this category has been steadily growing, accounting for more than 40 percent of total capital inflows. The main components under this category have consisted of external commercial borrowings, non-resident Indian (NRI) deposits and trade credit. These trends indicate a growing prominence of both short-term capital inflows, and debt-creating capital inflows in the Indian economy. While short-term portfolio inflows and external commercial borrowings may presently finance external

¹⁶It must be noted that Felipe et al. (2010b) suggest that India, although less successful than China, has also pursued industrial policies that make its export basket more sophisticated than what it would be expected on the basis of its income per capita level.

deficits and aid credit expansion, an overdependence on capital inflows increases financial fragility by entailing sudden stop risks and could worsen external competitiveness through an appreciation of the real exchange rate. They also generate liabilities which must be paid off at a future date. Remittances have also played a significant role in closing the current account deficit.

While the Indian current account has been in persistent deficit, the Chinese current account has been for the most part in surplus. This would indicate that while external financial fragility is an issue for India, it should not be seen as a serious threat in the Chinese case. However, it is important to notice in this context that the trade surplus shrank significantly in China, and that both a development strategy more reliant on domestic market within the context of trade conflicts with the United States suggest that the conventional export-led strategy has reached its limits.

Figure 7 – Guidotti-Greenspan Ratio



Source: World Development Indicators (WDI) database of the World Bank and authors' calculations.

Both countries are far from being close to a currency crisis. Figure 7 shows the Guidotti-Greenspan ratio (the ratio of reserves to short-term external debt) for China and India. The Guidotti-Greenspan rule says that a country should hold an amount of reserves equal to its short-term external debt. In a situation in which a country is holding an amount of reserves exactly equal to its short-term debt, the Guidotti-Greenspan ratio would be one. Both countries meet the Guidotti-Greenspan rule, with the ratio in both countries being greater than one, standing at 3.87 in China and 4.32 in India in 2016. For India, the exceptions are 1990 and 1991, the time when the country was experiencing a balance of payments crisis.¹⁷

More importantly, in China the strategy of internationalizing the yuan, and the desire to make it an international reserve currency, have created additional opportunities for a rising middle and higher middle class to diversify their portfolios. The result has been a significant loss of reserves in the last few years, which do not endanger the external situation in the short run, but raise questions about the limits to the Chinese catching up process. In our view, it is the external constraint, and the rising awareness in the United States that has led to a shift to more managed trade.

There might be a middle-income trap after all, but the main reason for its preponderance is neither technological, as Kaldor-Verdoorn suggest, nor demography. It is the result of the balance of payments constraint, and the necessity to borrow in foreign currency. The current era of financialization, and low interest rates in the center, particularly in the United States, however, has opened space for developing countries to borrow in domestic currencies. In that respect, the argument put forward by Grabel (2017), who suggests that the current era of emergent incoherence fosters somewhat surprisingly stability, seems relevant. This seems to have allowed for an expansion of the developmental space for peripheral countries, something that would have been unconceivable at the beginning of the century.¹⁸

¹⁷ For an analysis that puts the emphasis of currency crises on the external accounts, rather than the fiscal accounts, and the role of debt in foreign currency see Cline and Vernengo (2016).

¹⁸ See, for example, Wade (2003), who noted the significant limits to development strategies in the periphery with the creation of the World Trade Organization (WTO).

Conclusion

While it seems reasonable to assume that some of the predictions about the rise of China and India, and particularly about the changes to the Sinocentric world economic order are exaggerated, it is important to understand the relative rise of the two countries in comparative perspective. It is clear that to some degree the current success of both economies was associated not with the simple policy rules of the Washington Consensus, in which privatization, liberalization and deregulation played a central role. While significant liberalization did take place, the role of the State, through direct public investment, and through several forms of indirect policy intervention, has been key for fast growth and the catch-up process with the West. It is clear that China has what has been termed in the literature as a developmental state, but it is less clear that this is the case in India.

Also, it is important to emphasize that while growth has been high in both countries, the ability to incorporate workers, and integrate into the global value chains has been markedly different, with the more traditional industrialization strategy of China faring better than the service-led model of India. Not only in terms of employment generation, but also in terms of gains in productivity, and export performance, the industrialization strategy seems more conducive to catching-up.

In part, the geopolitical preoccupations of the Chinese State, the symbiotic relation with the United States for a long period, until recently, and the need for natural resources, which led to a process of internationalization of Chinese economic interests in other peripheral areas of the world, has implied a development strategy similar to the developmental state model that countries like Japan and South Korea had adopted in the past. Whether that model would be enough to promote catching-up or lead to a middle-income trap, in the current international environment, is unclear, but it seems that if a limit were to arise it would be from the balance of payments constraint. That is certainly not on the near horizon.

The case of India is more complex, since the developmental strategy pursued is less conventional, and, in

spite of higher rates of growth in the very recent past, it is more prone to external limitations. India has yet to unleash the process of structural transformation of the agricultural sector, that would lead to a significant increase of employment, and the expansion of mass consumption in the domestic market, the hallmark of industrialization and development. The absence of a clear state-led plan in that direction, and the absence of successful development experiences that have not used some of these strategies, suggests that a middle-income trap scenario is more likely in the Indian case.

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Appendix

There are no estimates of Verdoorn effects for China and India, and also no joint estimated of Okun and Verdoorn effects. Rada and von Arnim (2012) use a model which emphasizes the importance of a growing share of formal sector employment to examine possible macroeconomic policies that could sustain structural transformation in China and India, and they use Verdoorn effects in their simulation results. We try to estimate some preliminary results for both Okun and Verdoorn effects on both countries, providing empirical support for their simulation model.

The methodology adopted in this paper for the estimates for India and China's Okun and Verdoorn and Okun effects follows Jeon and Vernengo (2008). The method tries to separate the cyclical or short-run effects (Okun) from the structural or long-term effects (Verdoorn). Note that Okun's Law implies that productivity is pro-cyclical, and the Kaldor-Verdoorn suggests that productivity trends results from output growth. The method adopted precludes the need for finding potential output, and requires a partitioned regression. The equation estimated is given by:

$$p = a + bg + bc\Delta u$$

In the equation p stands for labor productivity, g for GDP growth and Δu is the change in unemployment. The Verdoorn coefficient, b , is directly observable in the equation, and the Okun coefficient, c , must be calculated after running the regression by dividing the joint coefficient bc by b . A partitioned regression is used to obtain a change in unemployment that is not correlated with GDP growth. The regression results for both the OLS and partitioned regression estimations suggested the presence of autocorrelation. To correct for autocorrelation, the Cochrane-Orcutt transformation was used.

The data used in the analysis are from the World Development Indicators (WDI) database of the World Bank. For each country, the estimation covers the period from 1993 to 2017, and the dependent variable is labor productivity. For China, the estimated Verdoorn effect remains 0.89 and statistically significant at the 5 percent level in the partitioned regression estimation, with the change in the unemployment rate modified to be uncorrelated with GDP growth. For India, the estimated Verdoorn effect is 0.88. However, the

Okun effect is are economically insignificant for both China and India, and statistically insignificant for China. Note that this should be expected in economies that do not experience recessions in the period analyzed.

Table 5. Okun-Verdoorn Estimates (1993-2017)

	China	India
Constant	0.00	-0.01
g	0.89* (21.4)	0.88* (12.5)
Δu	0.00 (1.25)	0.00* (2.92)
AR(1)	0.02	0.71
Adjusted R ²	0.95	0.88

* Significant at P<0.05

These results appear to be consistent with what we would expect in developing countries experiencing rapid economic growth. In such situations, high rates of GDP growth would enable rapid productivity growth because of increasing returns to scale, with the rapid growth of output being made possible by an expanding aggregate demand and by tapping into surplus labor. Thus, the Verdoorn effect would be large. However, since developing countries are do not experience significant recessions, but only slowdowns in the fast growth, cyclical fluctuations and, hence the Okun effect, is likely to be smaller.