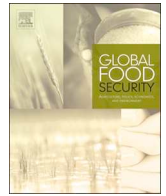




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Research article

Agricultural policy reforms: Roles of markets and states in China and India

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ABSTRACT

Market reforms have been given much of the credit for China's spectacular growth performance. This paper looks at China's reform process systematically, along with India's, and argues that the Chinese state has played a key role in transforming China into a modern economic state, deploying unlimited supplies of labor and combining it with a variety of initiatives in a pragmatic, nonideological way to promote public and private investment and create productive employment in agricultural, manufacturing, and service sectors. In contrast, India's reforms have been sporadic and are still a work in progress. The record-breaking expansion of China's financial system in fostering investments was initially overlooked, but has attracted considerable attention in recent years. Is China unique, or are lessons from the Chinese experience for public policy and its sequencing transferrable to agricultural and structural transformation in countries lagging behind, including India?

1. Introduction

Coronavirus disease (COVID-19) the The global pandemic and the global economic crisis, caused by the Corona virus (COVID-19), has raised issues anew of state capacity and markets. It will undoubtedly lead to massive new literature. Yet, even prior to COVID, there had been debates of public policy reforms and their outcomes. To confront the new, riskier global environment, we need to think about reforms in the context of state capacity. The latter was built or has weakened over time. Comparative, historical reform processes in China and India provide some timely food for thought. China set the pace, starting economic reforms in 1979, and India followed with economic liberalization in 1991. Both countries' performance slowed in 2018, and the global pandemic has slowed the entire global economy since.

China's market reforms have been credited with its extraordinary growth performance, described as "the biggest antipoverty program the world has ever seen" (McMillan, 2002, 94), leading to "the greatest increase in economic well-being within a fifteen-year period in all of history" (Fischer, 1994, 131). While China is being blamed for causing the global pandemic, it is also getting out of it rapidly. Indeed, the world's greatest democracies are adapting China's example to diagnoses, and novel, big-data-based, high-risk identification strategies to healthcare worker training, interpersonal communications with their populations, and to tracking the COVID-19.

Response impact in terms of how social distancing strategies and lockdowns are working. Data, analytics and digital solutions have been

key. Who would have predicted the pandemic or that China and its Asian neighbors, all erstwhile tigers, South Korea, Taiwan and Singapore would be world leaders in containing the pandemic?

India's 1991 economic reforms were less dramatic but were also credited with India shedding its slow "Hindu rate of growth," and joining the ranks of fast-growing economies (Mohan, 2017). Reforms continue in both countries, albeit at very different paces. The authors of *India Transformed*, a book edited by Rakesh Mohan, are all generally favorable to reforms, but note that India's reforms have ways to go. With the general slowdown of the global economy, IMF adjusted its projected 7.5 percent growth downward for each country in 2019 to 6.1 percent (IMF, 2018), and much more since the start of the pandemic in early in 2020. Swinnen and Rozelle (2006) explored in what respect and why China's (and Vietnam's) reforms were different from those of Eastern European countries, and Bardhan (2012) argued that the governance system, which is an essential part of the China development model, is less frequently discussed than the other aspects of this model. Also, when it is discussed in the general comparative governance literature, the emphasis outside China is more on the simplistic authoritarianism–democracy distinction. Authoritarianism, he argues, is neither necessary nor sufficient for some of the distinctive features of Chinese governance, both positive and negative—and their roots actually go far back in history—just as some of the recently observed dysfunctionality of governance in the United States or India is not inherent in their democratic process (Bardhan, 2020). We aim to fill this gap in the discussion of agriculture in the two countries.

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1.1. Outline of the paper

In this paper, we argue that the nature of the state explains countries' performance as much as do markets, for example, in achieving structural reforms and transformation, reduction in poverty, and food insecurity. Indeed, even the decision to rely on markets depends on the nature of the state. Development requires markets underpinned by solid public institutions that protect property rights, regulate market participants, maintain macroeconomic stability, and manage conflict (Rodrik, 2001).

The rest of this paper is in four parts:

Section 2 presents overall economic and agricultural performance of India and China comparatively, including some key indicators of performance; Section 3 provides comparative analysis of the reforms and of public investments. Section 4 addresses the political economy of reforms and how unique has been China's blend of a centrally driven approach and yet, with state capacity and flexibility at the local level, relative to the federalist India's decentralized democratic model. Much of this analysis is based on the insights of various analysts of Chinese and Indian reforms. Section 5 ends with conclusion.

2. Comparative performance of China and India

Structural transformation is frequently defined as agriculture's decline in the share of GDP and employment, as per capita income increases, accompanied by rural–urban migration and demographic transition (Timmer, 2009). Countries lagging in transformation hold larger shares of employment in agriculture while agriculture's share in GDP declines, so that most poverty remains in rural areas. China's smallholder-dominated agriculture has successfully created productive rural employment and shifted a considerable amount of labor to productive jobs in the manufacturing and service sectors, relative to India where structural transformation has lagged (Fig. 1 and Fig. 2). China has also performed better in other respects as well, as reported in this paper, which we argue is because of the nature of the state. India has lagged for some of these same reasons.

Together, China and India contain 36 percent of the world's population, 18 percent of global GDP in nominal exchange rates, and 25 percent in PPP terms. Of the nearly billion people pulled from poverty globally since 1990, by 2015 China had lifted 746 million from poverty and 154 million from undernourishment. It achieved all the Millennium Development Goals (MDGs) by 2015. India had lifted 164 million from poverty but only 20 million from undernourishment. India was behind in meeting MDGs and remains so on several Sustainable Development Goals (SDGs) embarked on in 2015, and, is being monitored routinely since then to achieve the targets by 2030: poverty (SDG1), hunger (SDG2), health (SDG3), education (SDG 4), gender (SDG5), and water

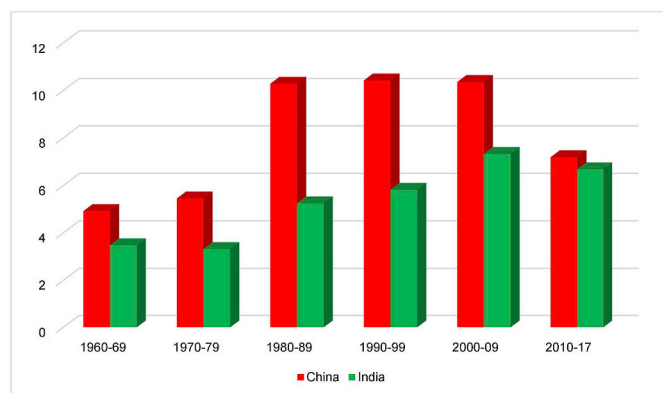


Fig. 1. Trend in GDP Growth Rates (%): China vs India (1960–2017)

Source: Authors' calculation based on data from the World Development Indicators (World Bank, 2018c).

and sanitation (SDG6). China was behind India only on SDG indicators related to the environment, smoking, and pollution-related deaths. China's poverty and food security indicators (numbers and share of poor, undernourished, stunting, wasting, and infant and child mortality) have improved faster than India's, except for overweight and obesity. There will be no sustainable future without eradicating poverty and hunger sustainably.

2.1. GDP growth

In 1980, India seemed slightly ahead of China in per capita GDP in constant terms and in PPP dollars, with a smaller population and better infrastructure (Table 1). With outstanding growth performance over several decades, however, by 2017, China's per capita income was more than three times higher than India's. With growth and development China is a more influential player in the global economy. From 2010 to 2017, China's economic growth contributed 33 percent to the increment of global GDP growth, compared to India's 15 percent, the US contribution of 10–12 percent, and the European contribution of less than 10 percent (Virmani, 2018). China is also the largest contributor of external aid to Africa.

Even if the two countries' performances are considered from the years in which their reforms started, from 1980 for China and 1992 for India, as in Agarwal and Whalley (2013), China's GDP in 2017 was 3100 over 1980 base of 100, whereas India's was 500 over a 1992 base.

2.2. Land productivity

In 1961, per hectare yields and area under cereals were similar for the two countries. China's cereal production increased by a factor of six from 1961 to 2016, whereas India's grew by a factor of three. China's value of other agricultural production, too, was substantially higher than India's.

2.3. Total factor productivity

Total factor productivity (TFP) is a better measure of performance than yield growth. TFP has been considerably higher in China, as measured by the growth accounting method, most recently updated by the Economic Research Service of the United States Department of Agriculture (USDA, 2019) and discussed in Fuglie et al. (2019) (see supplementary Fig A1). It is consistent with earlier studies by Evenson and Fuglie (2010), as well as by using data envelope analysis (DEA) (Nin-Pratt et al., 2009). Gautam and Yu (2015), in an extensive survey of TFP growth, using their own estimates for the two countries, confirmed China's superior performance.

India's real agricultural GDP growth was 2.6 and 3.2 percent during 1960–2004 and 2004–2014, respectively, compared to China's higher 4.3 and 4.4 percent. India's agricultural growth also experienced much higher standard deviation than China (Government of India, 2018). This is in part because China has a more favorable temperate climate than India's semi-arid tropics, where 60 percent of the production is rainfed. China lacks the possibility of year-round production in considerable parts of the country. And, in areas not suited for agriculture, China's forested area has increased from 157 million hectares to a whopping 208 million, a 32 percent increase compared to India's 11 percent increase from 64 million to 71 million hectares.

Agricultural TFP growth, which does not include forested areas, has played a key role in differences in their rates of structural transformation. They each have had similar areas under cereal production, 98 million hectares in the latest year, and area under irrigation, about 51 million. Agriculture still provides close to half the employment in India at low levels of labor productivity (Lele et al., 2018). China's agricultural employment share stood at 55 percent in 1991 (64 percent in India) and declined dramatically to only 18 percent (43 percent in India) in 2017, with about 3.5 times higher value-added per worker in agriculture due

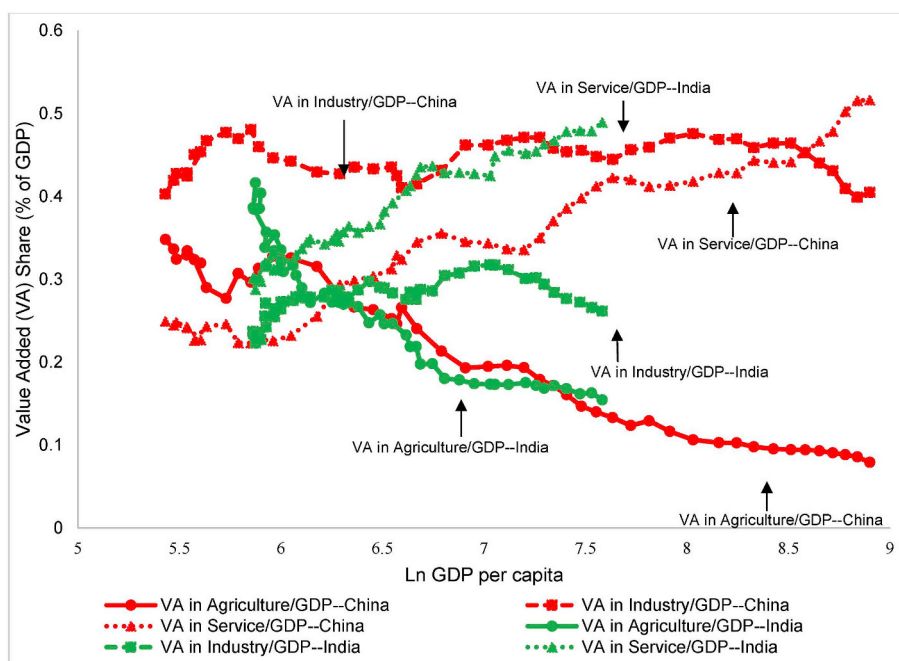


Fig. 2. Trends in shares of value added in agriculture, service, and industry sectors (in total GDP) with respect to per capita income (1970–2017)
 Source: Authors' calculations based on data from the WDI (World Bank, 2018c).

Table 1
 Agriculture in context—China vs. India and Change from 1980 to 2017

	China		India	
	1980	2017	1980	2017
<i>Economic context</i>				
GDP (billion constant 2010 US\$)	341	10,161	272	2630
Population (millions)	981	1386	697	1339
GDP per capita (constant 2010 US\$)	348	7329	390	1964
GDP (billion constant 2011 international \$ in PPPs)	1894 (1991)	21,224	1543 (1991)	8606
GDP per capita (constant 2011 international \$ in PPPs)	1646 (1991)	15,309	1738 (1991)	6427
Gross savings (% of GDP)	34 (1984)	47	14	32
Gross fixed capital formation (% of GDP)	29	42	19	29
Trade (% of GDP)*	12	38	16	41
Land area (million ha)	942	942	297	297
Population density (people per km ² of land area)	105	148	234	450
Agricultural area (million ha)	429	529	180	180
Forest area (million ha)	157 (in 1990)	208	64 (in 1990)	71
<i>Agriculture in the economy</i>				
Agriculture value-added share (% of GDP)	30	8	33	15
Agriculture employment share (% of total employment)	55	18	64	43
Food exports (% of merchandise exports)	15 (1984)	3 (2016)	23 (1984)	11 (2016)
Food imports (% of merchandise imports)	9 (1984)	7 (2016)	10 (1984)	7 (2016)
<i>Characteristics of the agricultural sector</i>				
Crop in total agricultural production (%)	82	70 (2016)	82	73 (2016)
Livestock in total agricultural production (%)	18	30 (2016)	18	27 (2016)
Share of arable land in total agricultural area (%)	23	23 (2015)	90	87 (2015)

Note: *Trade is the sum of exports and imports of goods and services, measured as a share of GDP.
 Source: World Bank (2018c); ILO (2018); FAOSTAT (2017).

to more rapid diversification of agriculture away from staples (US\$5805 in China, compared to US\$1679 in India in 2017), representing a higher labor agricultural labor productivity of a smaller work force in agriculture.

India's population of 1.339 billion in 2017 was like China's 1.386 billion. China's demographic transition, that is, the decline in the rate of growth of population, however, has been faster than India's. In 1980, India's population was only 697 million, compared to China's 981 million (Table 1). Much of the labor has moved out of agriculture to higher productivity jobs in the manufacturing and the service sectors.

Yukon Huang, a student of W. Arthur Lewis and former World Bank

country director based in India, notes that the Chinese state has played a key role in addressing internal structural issues for an overall strategy, secure land titles, human capital, and infrastructure, explaining China's extraordinarily rapid transformation from agriculture; this fits well with the Lewis model of unlimited supplies of labor in a modern industrial state. By contrast, in a personal exchange, he asked whether democratic India has deployed the Lewis model? Beyond fostering markets, the Chinese state has played key roles in rural employment growth; rural poverty reduction; increased food security; education and health access—particularly, of women—and the management of environmental commons with technology, rules and regulations, and

community participation. China's agricultural reforms, introduced under Deng Xiaoping and Zhu Rongji (first Vice Premier, later Premier), followed the failures of the "Great Leap Forward" (1958–62) and the Cultural Revolution (1966–76). The Household Responsibility System was first introduced in agriculture in 1979, and gradually extended to other sectors of the economy. Thus, whereas agricultural reforms have been integral to the overall development strategy in China, agriculture's role in the overall strategy has been less clear, as we discuss in Section 2. Also, China's rapid growth in exports, foreign direct investment (FDI) and higher savings and investment have enabled it to invest massively in physical, human, and institutional capital. This has far exceeded what foreign aid could realistically muster, and in the later period, to foster product and factor markets. India's remittances soured from early 1980s until 2011, reaching 4 percent of GDP, compared to China's 0.5 percent of GDP, and they contributed to household expenditures but did not have much impact on public investment.

Despite its impressive agricultural performance, China also became a major trader. China's share of agricultural imports increased from 2.3 percent in 2000, to 8.2 percent in 2016, making it third among the top 20 importers, after the United States and the European Union (member organizations). Between 2000 and 2016, India, a less open trader, ranked 8th, with 1.9 percent of the global imports. In 2000, China ranked 6th, and India ranked 17th (FAO, 2018).

Except for a few brief periods, India's external balance has been precarious over a long haul (see [supplementary Fig. A2](#); [World Bank, 2018c](#)), and its dependence on external aid, albeit small on a per capita basis, is greater than China's.

Macroeconomic regimes and performance in each country have been key to the extent to which agriculture and rural development have been supported, or overlooked, with neglect of this sector, in turn, weakening macroeconomic performance. More support for this argument is in the next section.

China's share of value-added and employment in agriculture in total GDP has declined faster than India's ([Fig. 2](#)). Industry share in value-added peaked at 48 percent, remaining higher than India's, with a decline in recent years and a change in the industrial structure. State-owned enterprises (SOEs) created substantial employment for labor released from agriculture, following spectacular productivity growth in the 1980s, but unchecked SOE expansion resulted from local governments' financing enterprises via a combination of sales of land, taxation, and bank borrowing, leading to questions of their efficiency and transparency. Since the 1980s, SOEs have undergone major fiscal and monetary reforms, reining in non-performing bank loans. Many inefficient downstream TVEs in consumer and intermediate sectors have failed, with the remainder aiming to become more efficient and competitive, creating employment while meeting growing consumer demand. SOEs remain dominant in the large-scale heavy industry sector, such as semi-conductors, telecoms, energy, steel, and defense, but there, too, reforms are underway to make them more efficient and productive. Perhaps, the best indicator of competitiveness, manufactured goods accounted for 80 percent of exports in the 1980s, of which labor-intensive goods comprised about two-thirds of manufactured exports. China's export basket has diversified. The share of textiles and clothing in exports has decreased. Exports of high technology machinery, transport equipment, and telecommunication equipment have increased to nearly half of China's exports. A striking feature is the rapid increase in imports of raw materials, with China becoming a leader of global value chains ([Agarwal and Whalley, 2013](#); [World Bank and WTO, 2019](#)).

China's extraordinary 10 percent annual rate of growth continued for three decades, but after the 2007 financial crisis, with the slowing of commodity exports, China continued to expand its financial system to build a powerful service sector—beyond real estate to infrastructure expansion, including highways, bridges, and airports, through a dizzying pace of innovations (not just imitation) in e-commerce and other Internet-based services. These innovations fostered rapid growth of the

service sector, including financial technology, artificial intelligence (AI), 5G cellular network technology, semi-conductors, and biotechnology—outstripping China's manufacturing and India's service sectors ([Fig. 2](#)).

3. Comparative analysis of the reforms and of state investments in India and China

The Chinese state has played a key role in addressing internal structural issues of an overall strategy, secure land titles, human capital, and infrastructure, explaining China's extraordinarily rapid transformation from agriculture, with unlimited supplies of labor to a modern industrial state. Attributing China's superior performance mainly to market reforms, most studies understate the critical role of the state, underemphasizing its lessons for lagging countries. Lessons include long-term vision and consistency; substantial investments in public goods; and experimentation, adaptation, scaling up, and evolution based on lessons learned. The implementation of the household responsibility system (HRS) in China was a "market" reform, returning collectivized land to farm households, allowing households to make farming decisions. HRS was followed by unprecedented rates of investments in agricultural research and development (R&D) ([ASTI Network, 2019](#)) and was accompanied by physical infrastructure, education, and institutional reforms in the agricultural and rural sector, directly and indirectly contributing to China's extraordinary economic transformation (see [supplementary Fig. A3](#)).

With slowing globalization and world trade, the external and internal environments for both are less favorable in 2019, than prior to the Global Financial Crisis (GFC). India's Economic Survey ([MOF, 2018, 68](#)) noted the potential risk of a "late converger stall" from backlash against globalization. However, [The Economist \(2019\)](#) has argued that causes of India's less than stellar performance are domestic, that successive governments—state as well as national—have failed to promote sensible, consistent policies to promote growth. China has had an exceptional record of speedy design, implementation, experimentation, and learning from successes and failures of interventions.

3.1. Chinese reforms: China's three-legged development strategy

China has displayed a unique blend of political centralization with economic and administrative decentralization, making it a strong conceptualizer and implementer of strategy. In India, political will to adopt tough policies is often limited, reforms are slow to materialize, and state capacity to implement the policies has weakened over time ([Bardhan, 2020](#)).

China's overarching, three-legged strategy is described well by Yukon [Huang \(2017\)](#): (1) agricultural reforms starting with the household responsibility system (HRS); (2) industrial reforms through town and village enterprises (TVEs) metamorphosing into a full-fledged industrialization strategy, by promoting partnerships between local authorities and private entrepreneurs; and (3) establishment of special economic zones (SEZs) in coastal areas, allowing market forces to counter forces that previously benefited well-placed local authorities, while taking steps to foster production for international trade on a highly competitive basis. Until the 1980s, when China became member of the Bretton Woods institutions, China was isolated. Exports were needed to finance imports, and hence, it had a strong incentive to become export-oriented ([World Bank, 2018c](#)) (see [supplementary Fig. A4](#)).

With agility, ideological flexibility, and results ranging from physical and human capital, R&D, and institutional reforms of service delivery, China has pursued decentralization of development to provincial and local governments to co-opt, if not overcome vested interests, in the pursuit of "bottom-up" reforms and entrepreneurship on a large scale ([Gulati and Fan, 2007](#); [Bardhan, 2012](#)).

One of the important areas of reforms was in the trade sector.

China's trade-weighted statutory tariffs stood at 40 percent in 1992. In the next decade, before becoming a WTO member in 2001, the tariffs declined to an estimated 7 percent (Huang, 2017). In a comprehensive literature review and analysis of agricultural reforms in transition economies of Asia and Eastern Europe, Rozelle and Swinnen (2004) credited China's market reforms for its performance. Indeed, the narrative of China's market reforms has been a consistent theme in the literature and among international organizations. The World Bank illustrates the point: "Since initiating market reforms in 1978, China has shifted from a centrally planned to a more market-based economy and has experienced rapid economic and social development. GDP growth has averaged nearly 10% a year—the fastest sustained expansion by a major economy in history—and more than 850 million people have lifted themselves out of poverty" (World Bank, 2018b).

Rozelle and Swinnen (2004, 405) stressed the pragmatism of reforms, noting their gradual sequencing, initially focused on reforming land rights, and attributed the success of agricultural reforms to the "the rise of incentives provided by decollectivization." Huang (2017) noted that agrarian reforms drove the initial surge in production. Growth increased sharply in the first half of the 1980s, with the new HRS. Land leases also emerged, shifting user rights from collectives to households. By simply allowing farmers to sell their surplus on the market, increasing procurement prices, and reducing state-mandated quotas, rural per capita incomes tripled between 1978 and 1984. The HRS reforms revealed spectacularly how far below the production possibility frontier that Chinese farmers had been operating before its introduction. The HRS contributed to a surge in GDP growth rate to 14 percent by the mid-1980s. Sicular (1994) discussed the continued quota system and subsidies to grain prices in the 1980s and its gradual reform in the 1990s (see, also, Gulati and Fan, 2007).

Chinese land reform, which provided longer term leases to households, is by no means perfect. Local officials still occasionally confiscate land without adequate compensation. Furthermore, land is not tradable, arresting the pace of the land rental market and land consolidation (Rozelle and Swinnen, 2004). Yet, clarity and security of tenure is better in China than in India. Swinnen and Rozelle (2006) in a more elaborate study, "From Marx and Mao to the Market," attribute the success of reforms to the congruence of interest between the leadership at the top and interests in reforms at the bottom, unlike in Eastern Europe, where large-scale operators of state farms did not necessarily support such drive for reforms from progressive leaders at the top.

The HRS was followed by overhaul of China's food-grain marketing system in the mid-1990s, increasing rural incomes and paving the way for rapid changes in technology and crop diversification—a considerable achievement, after the decimation of China's agricultural research and education system by the "back-to-the-country" movement of the educated class during the Cultural Revolution. Rebuilding the R&D system brought yields in line with other high-performing countries.

By the late 1980s, when momentum from the initial agrarian reforms was ebbing, growth was given a new impetus with the emergence of rural-based TVEs. Together, these reforms helped push GDP growth rates well into double digits during the first half of the 1990s. By 2001, WTO trade-related reforms eliminated any remaining pricing biases against agriculture—which we show, based on OECD studies, has been considerable in India, encouraging a shift in the cropping mix to favor crops more in line with China's comparative advantages. Reinforced with a wholesale reduction in agriculture taxes and fees, the reforms uplifted agrarian incomes and helped moderate regional disparities and has been aided since by substantial agricultural support.

According to Rozelle and Swinnen (2004, 405), the "transition in agriculture could succeed, in the early years, without the disruption caused by the dismantling of government-run marketing channels and in the absence of well-functioning markets." The gradual approach of the withdrawal of the state, and yet, its continued strategic presence, contrasts to rapid reforms that the Bretton Woods institutions promoted in Africa and elsewhere, where gradual and consistent reforms were

needed even more, as both markets and states were weaker than in China. Yet, since 2000, China's support to agriculture increased substantially (Huang et al., 2015; Huang and Yang, 2017). Using OECD's standard method of estimating agricultural assistance, China's agricultural producer subsidies in 2018 amounted to the subsidies of all OECD countries combined (OECD, 2018a, b) (see supplementary Fig. A5). Even considering input subsidies, India's support to agriculture has been negative since 2000. Analysts have explained this difference as due to China's tendency to appease rural populations, given its history of rural revolts compared to India's tendency to keep urban food prices low to appease urban consumers.

Not surprisingly, China accumulated mounting grain stocks. Year-to-year variance is considerable. Grain stocks in 2017 were 71 percent of all agricultural production in China, compared to 16 percent in India (AMIS, 2018) [see supplementary Fig. A6]. On average, since 2000, China's grain stocks are 5.6 times higher than India's. India's stocks are critical to support India's National Food Security Act, 2013.

3.2. India's import-substituting industrialization, aid dependence, and weak role for agriculture in the overall development strategy

The United States and the West supported India as an antidote to Communist China. India was a founding member of the non-aligned movement. With its colonial experience, Indian leadership embraced an import-substituting industrialization strategy to become a great industrial power, to which its once thriving textile and steel industry had attested. India's first balance of payments crisis (1958) led to realization within the World Bank of the growing capital needs of a rapidly industrializing India, prompting the establishment, in 1960, of the International Development Association (IDA), the concessional window of the World Bank. Developing countries sought aid through the United Nations, but Western donors opted for establishing IDA in the World Bank and providing technical assistance through the United Nations Development Programme (UNDP) (Lele and Goswami, 2020, forthcoming). India's second and third balance of payments crises occurred in 1964–66 and at the end of the 1980s, respectively. According to Srinivasan (1996), the mid-1960s crisis was a missed opportunity for reforms; but the late 1980s crisis resulted in major internal reassessment and reform of the industrial and trade policy, led by Finance Minister Manmohan Singh in the Rao Cabinet of the Congress Party (see Mohan, 2017). Until the second financial crisis, the Bank's view about India was that it could do no wrong.

When India's external situation began to deteriorate in 1964–65, the World Bank mounted the Bell mission, recommending a major devaluation, substantial liberalization, and abandonment of the import-substituting industrialization strategy based on heavy industry, in support of light industrialization to meet the requirements of the growing food and agriculture sector. Prime Minister Indira Gandhi embraced the new, technology-based agricultural development strategy recommended by Sir John Crawford, a member of the Bell mission; made some exchange rate adjustments; and adopted some liberalization measures. After a second drought and severe criticism, even from within her party, for caving in to pressure from Bretton Woods institutions, reforms were dropped, the beneficial impact of devaluation evaporated, and the Bank did not keep its promise for the balance of payments support on the scale (Srinivasan, 1996).

Overall, India has received the largest amount of IDA of any country—although small in per capita terms—with a significant share in support of food and agriculture. The Green Revolution was a success, but agriculture has not continued that success (Lele and Bumb, 1994; Lele and Goswami, 2020). Sukhamoy Chakravarty, India's foremost economist, wondered in a speech why Mahalanobis, the architect of India's Second Five Year Plan, had not recognized the key role of agriculture as a source of employment of surplus labor, income, and demand for goods produced in the industrial sector, the so-called Lewis model (Chakravarty, 1983). In addition to industrialization of heavy

industry, India pursued a rural industrialization strategy in its first few plans, based on Gandhian ideals, but not so much to create mass production and employment. Chakravarty speculated that overlooking agriculture may have been, perhaps, because agriculture was doing well due to the Green Revolution, starting in the mid-1960s. T. N. Srinivasan (1996) suggested that it had more to do with India's industrialization and trade strategy, influenced by Mahalanobis's Second Five Year Plan. He contended that Mahalanobis's influence on development strategy continued for 35 years. The Planning Commission had indeed prepared a Basic Needs Strategy for India in the mid-1960s amid growing concern about poverty, but it was not implemented. Had it been, social indicators would have been better. Those ideas had no traction in India's Five-Year Plans, according to Srinivasan (1996). The Basic Needs strategy, originating in India, was adopted by UNDP, according to Srinivasan.

Jagdish Bhagwati, another luminary of Indian economics, has summarized factors that explained India's third economic crisis, at the end of the 1980s, in three major groups: "(1) extensive bureaucratic controls over production, investment, and trade; (2) inward-looking trade and foreign investment policies; and (3) a substantial public sector, going well beyond the conventional confines of public utilities and infrastructure. The former two adversely affected the private sector's efficiency. The last, with the inefficient functioning of public sector enterprises, impaired additionally the public sector enterprises' contribution to the economy. Together, the three sets of policy decisions broadly set strict limits to what India could get out of its investment" (Bhagwati and Srinivasan, 1993, 46–7).

Post-1991 reforms included liberalization of the trade and industrial policy, automatic approval of FDI, privatization of industries, and disbanding of the licensing system. Liberalization has had a major, positive effect on GDP growth, but agricultural performance has been mixed. Private investment in agriculture increased rapidly from the mid-1990s, accounting for more than 80 percent of the investment in agriculture. Investment consisted largely of on-farm investments, primarily in irrigation pumps, and to a lesser degree, in machinery. Overall, investment on the farm remains low, and farmers prefer to allocate more of their disposable incomes to financial savings and expansion of business capital. After almost two decades of sustained expansion (with growth peaking in the early 1990s, at about 3.6 percent), growth decelerated from 1996–97 to 2004–05, largely due to poor rains, resuming again to 3.5 percent per year before deteriorating again in 2011, also due to poor rains.

An unintended consequence of the Green Revolution may have been that food self-sufficiency created a sense of complacency. Although diversification of agriculture away from cereals has occurred, it is not near that of China. Public-sector, interventionist agricultural policies, introduced as part of the World Bank conditionality in return for aid in the 1960s to correct market failures and generate the Green Revolution, also created vested interests in public interventions and subsidies that have been hard to shake off. And yet, to keep food prices low for urban consumers, India has opted for negative support for agriculture, unlike China. Even today, India's GDP is closely related to its agricultural performance, which remains dependent upon rainfall, despite substantial investment in irrigation (World Bank, 2014).

India's latest agricultural strategy is not sufficiently focused on increasing smallholder productivity, while aiming to reduce the current unsustainable levels of groundwater overexploitation and build a resilient agriculture in the face of climate change, which is affecting India more severely than China (see Lele, 2017). A doubling or tripling of investment in agricultural research and innovation is needed to make up for the past shortfalls, secure land tenure, and substantially invest more in physical infrastructure, the seed industry, value chains, agro-processing in active partnership with the private sector, and in remote sensing and communications to deal with the impending climate crisis—a water, agroforestry, and forest strategy to promote conservation-oriented, climate-smart agriculture (see Paroda, 2018). In India, based

on revenue data and the National Sample Survey data, ownership and operational size of holding is declining over time. According to NSSO data, tenancy in India is rising and is widespread in some states. Yet, increase in lease-in and lease-out is not resulting in an increase in operational area of farm size over time thus far (Ramesh Chand, personal communication, January 8, 2018). So, even though small farmers are more productive, they cannot make enough income. Land consolidation and increased aggregation of marketed agricultural produce is needed.

Replacement of the Planning Commission by Niti Aayog (the National Institution for Transforming India), in 2015, was consistent with India's growing federalism. NITI Aayog was formed on January 1, 2015, to be the premier policy think tank for the Government of India (GOI). Providing both directional and policy inputs, it designs strategic and long-term policies and programs for GOI and provides relevant technical advice to the central and state governments. With no allocative power, it does not monitor the use of centrally allocated resources to the states. The Finance Ministry has that responsibility, but it would need bolstering to address the center's leverage on the way resources are allocated to the states and the effectiveness with which resources are spent. An independent evaluation unit reporting to the federal cabinet would increase public accountability of taxpayer resources allocated to the states.

3.3. Outcome of India's policies

By remaining a stable, thriving democracy with multi-party competition and generally free and fair elections, India has met the expectations of its citizens and its Western supporters. It will become the world's largest country in 2027, as India's demographic transition has been slower than China's and the East Asian Tigers.

Per capita income has increased steadily in each successive decade, unlike in Latin America and Africa. With food self-sufficiency, its poverty rate has declined, life expectancy has increased, and its industrial base has increased manifold. These achievements are shown in Table 1 and Fig. 1, in comparison to China. Yet, by only haltingly abandoning its import-substituting industrialization after 1991, by not proactively supporting its agricultural and rural sectors with investment in quality education and infrastructure, and by fully embracing a liberal trade strategy, India leads the world in the number of poor and food insecure, with the highest child mortality, stunting, and wasting (Development Initiatives, 2018; UNICEF, 2019).

India's service sector share in GDP was considerably higher, and its industry share, at 31 percent, already considerably lower than China's, declined to 26 percent. Despite policies promoting industrialization, including "Make in India," establishment of Special Export Zones, and improving its rating on the "Doing Business" Index, the share of India's manufacturing sector declined in the most recent period. India's manufacturing exports, as a share of GDP, increased until 2013, before declining, whereas Chinese exports reached a peak in 2006, as a share of GDP (World Bank, 2018c) (see supplementary Fig. A4).

The World Bank noted, "Every month, the working age increases by 1.3 million people, and India must create 8.1 million jobs a year to maintain its employment rate, which has been declining based on employment data analyzed from 2005 to 2015, largely due to women leaving the job market" (World Bank, 2018a). More than 80 percent of the manufacturing employment is informal in India (SDG8 calls for formal employment). India's SEZs are not working as expected (Pal and Mukherjee, 2018). Some argued that they were not expected to work well, because differences in SEZs and the outside have not been as divergent in India, as in China. A robust manufacturing sector and an educated labor force are needed to create productive industrial jobs. China's human capital situation is superior at all levels. It has several universities that rank high among the world's best. India has none.

3.4. A demographic dividend?

A democratic India could not have pursued the one-child policy that China did; but almost all growth in India's population has occurred since 1980, following the failure of forced sterilizations, practiced briefly during the declaration of emergency from 1975 to 1977, and a neglect of a quality educational system, particularly for women. India's population is now projected to exceed China's, reaching 1.437 billion by 2024. *Youth unemployment is a ticking bomb.*

4. Political economy of reforms: China's centrally driven approach shows results relative to federalist India's

China's commitment to build its own human capital and institutions has been extraordinary since the destruction of the Cultural Revolution. The first loans and credits that China requested from the World Bank, after becoming a Bank member in 1980, were in support of universities to rebuild human and institutional capital decimated during the Cultural Revolution.

In contrast, in the 1970s, India was building a world class agricultural research system, with the help of the Rockefeller Foundation, USAID, and the World Bank (Lele and Goldsmith, 1989). Together, with the world's largest concessional IDA assistance in support of irrigation development in several states (Lele and Bumb, 1994), India became the cradle of the Green Revolution. Unfortunately, it has allowed those institutions to lag relative to China's.

China's 30 percent increase in forest cover, like its extraordinary agricultural growth, is another example. It resulted from forest tenure reform, with the state giving control of the forestland to households, following the successful agricultural HRS. It was accompanied by the world's largest program of payments for environmental services (Xu et al., 2010). Recent large household surveys suggest that with a full shift of forest management rights from collectivization to complete privatization, household inequity in daily consumption, housing, and total consumption will decrease significantly (Yang and Xu, 2014; Huang et al., 2018). Additionally, tenure reform benefits large numbers of previously less advantaged households relatively more than those previously more advantaged, increasing household incentive to invest in forestlands, whereas reduction in subsidies given to households increases the chances of reconversion of forestland into agriculture. The Chinese state has played a key role in forest expansion by making tough policy decisions. India, too, has gained forest cover but only by 10 percent.

Implementation of the 2006 Forest Rights Act has been slow, due to competing interests of tribal populations with relatively little policy influence, environmentalists, civil society actors, and those controlling mining interests (PRS, 2006). Forest-dependent people fare better in China than in India.

India faces greater water scarcity than China. In a comparative paper on how China and India are addressing water scarcities, Lele documents that China's investments in surface irrigation are more than 10 times that of India's, and groundwater use is controlled by a combination of new technology, including remote sensing, community responsibility, and rationing of water use in agriculture, together with change in water-saving cropping patterns. India is already facing excessive groundwater overdraft, and a combination of drip irrigation and solar energy calls for stronger water governance at all levels (Lele, forthcoming).

4.1. Public investments in agriculture

China's public expenditure in agriculture, reported by FAO, is large. Fig. 3 shows the towering differences between China and India in the total gross fixed capital formation and FDI inflows in agriculture. India's investments in agriculture and FDI have increased, but are not nearly

comparable to China's, or nearly what Indian agriculture needs to meet SDGs (FAO, 2017).

4.2. Political economy of policy reform

How unique is China's experience? Certainly, national contexts are very different. State control is stricter in unitary China. It has become conventional wisdom among China watchers that accountability of the government and the party at multiple levels to deliver development outcomes is greater, as the primary source of the regime's legitimacy, given the absence of democratic institutions. The government takes delivering results seriously as a means of political stability, and indeed, with the exception of some protectors of human rights, most of the population is content with the government's actions to improve standards of living. Effective participation of the poor in development outcomes is weaker in India. Elections lend legitimacy to the party (or parties with coalition governments) in power, but party competition makes it difficult to enforce regulation in India. For example, restrictions on water demand or on crop burning to reduce pollution remain unpopular, even as concerns grow about environmental sustainability. India's power subsidies for farmers result in 30–40 percent of power and groundwater going to waste, but collective action to implement solutions, which work in China, are not considered in India. Shah has argued that risking revolt from a vast voter base is unappealing to governments (Shah, 2014).

Replacing input subsidies, which match the entire public expenditures in agriculture, with productive investments is urgently needed, but politically difficult. On a pilot basis, India is experimenting with cash transfers, eventually to replace its large, in-kind public food distribution program and its input subsidies.

China faces a slowing economy, with a third of the global debt of governments, the non-financial sector, and households, partly resulting from the fiscal stimulus that China adopted post-GFC, much like advanced countries (Lund et al., 2018).

All is not well in all parts of China. Rozelle's research describes the "other China" (Rozelle and Johnson, 2018), where 500 million people live—still poor, undereducated, undernourished, suffering from easily treated health problems, and ill-equipped to accept employment opportunities in dynamic China. Rozelle and Johnson noted, "China faces a looming crisis. But no one can see it coming" (Rozelle and Johnson, 2018). India's crisis of 250 million is already here, more visible, requiring more investment targeted to them.

5. Conclusion

China's unitary government's willingness to adopt bold reforms highlights how smallholder agriculture development calls for substantial public investment and an astute combination of centrally driven public policies over the long haul, with key private sector roles for smallholders and entrepreneurs at all levels: farm households, communities, and the corporate sector. Incremental changes adopted by India's central and state governments have been insufficient to achieve rapid agricultural productivity growth, with the need for public, private sector, and foreign investment hobbled by its fragmented multi-party system of political competition. A comprehensive, integrated, long-term strategy and its implementation, shared by all political parties, is needed for agricultural science and technology: an effective extension system, infrastructure, investment in human capital, and market access, involving key stakeholders—the scientific community, private sector, civil society, and farming communities—taking advantage of India's innovative industries, such as IT and pharmaceuticals. Adaptive learning within and across states, with accountability for results to India's millions of farmers and consumers, should become the hallmark of development culture, replacing religious and caste-based politics and the rigid, multiplicity of top-down government initiatives, which often

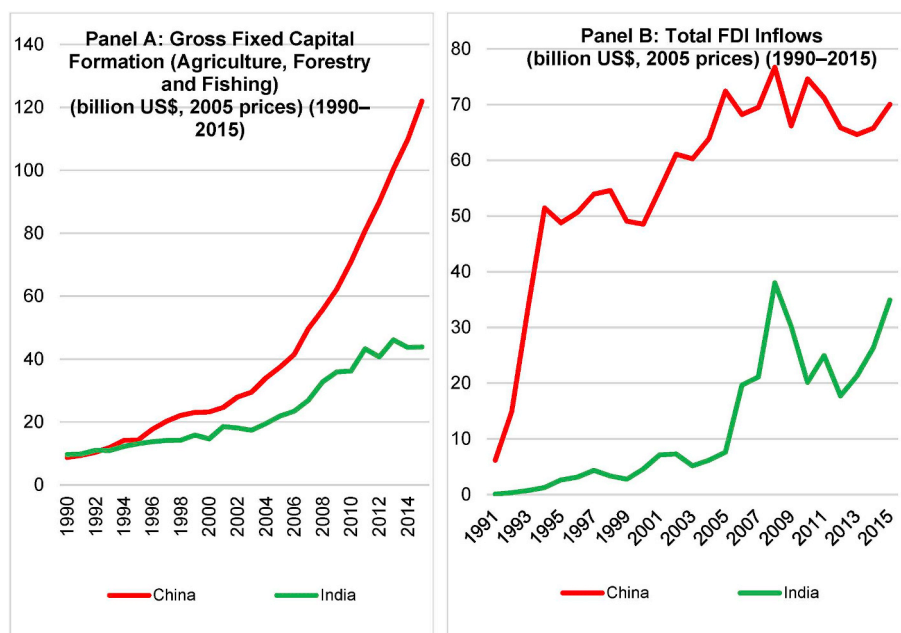


Fig. 3. Panel A: Trends in gross fixed capital formation (Agriculture, Forestry and Fishing) (billion US\$, 2005 prices) (1990–2015) Panel B: Trends in total foreign direct investment inflows (billion US\$, 2005 prices) (1990–2015)

Source: Based on data from FAOSTAT (2017).

remain partially implemented. An important lesson from China is getting things done, where both the top and the local leadership matters.

Declaration of competing interest

There were no conflicts of interests for this work.

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Appendix A. Supplementary data

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