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ECONOMIC GROWTH IN INDIA DURING 1950–2015: NEHRUVIAN SOCIALISM TO MARKET CAPITALISM

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Abstract. Comparisons of pre and postreform economic growth in India are widely researched in the literature. This paper adds to this literature, but with a sectoral growth accounting perspective. We compare the proximate sources of economic growth in India during the 1950–1980 periods, the so-called Nehruvian socialist regime, with that of the post-1980 period, which includes the pro-business reforms in the 1980s and more aggressive pro-market reforms in the 1990s. We document two important features of India's growth dynamics. First, the overriding importance of the services sector in India's growth is not new, but it has always been the case in independent India. However, there has been a major shift in the composition of service sector growth. While the socialist regime fostered more nonmarket services, including the government sector, the market services sector flourished in the market regime, in terms of labour productivity, TFP and economic growth. Second, the economic growth in the socialist period was substantially driven by capital accumulation, except in the nonmarket services, whereas the market regime sees a combination of both productivity and capital accumulation.

Keywords. Economic growth; Productivity; Services; Socialism; Market capitalism

1. Introduction

Many countries in Asia and other parts of the global economy witnessed decolonization and the birth of nation-states after World War II. India got independence from nearly two centuries of British colonial rule in 1947. Since then, India adopted a set of economic policies inspired mainly by the Soviet idea of planning. With centralized political power and continued state-financed capital accumulation, the Soviet Union was able to achieve high growth.[1] India, a democracy by choice, neither had centralized political power, nor the endowments to provide continuous financing of capital.

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Table 1. GDP and Per Capita GDP Growth and Per Capita Income Levels in India, 1900–2016.

	1900–1947	1935–1950	1951–1964	1965–1979	1980–1992	1993–2016
GDP growth	0.5	–0.7	3.9	3.0	5.0	6.7
Per capita GDP growth	0.1	–0.7	1.9	0.8	2.9	5.2
Relative levels of per capita income (last year of each period)						
Relative to the US	6.1	5.7	5.4	4.2	4.9	11.6
Relative to the world	28.8	26.6	20.6	15.4	19.6	39.4

Note: The level data refers to the last year in each period (e.g. 1947 in 1900–1947) and are obtained in 2018 PPP from the Conference Board Total Economy Database, except for 1947. The data for 1947 is extrapolated using the trend in real GDP in 2011 PPP data from the Maddison Project. Note that the growth rates in this table, which are based on aggregate GDP, may vary from the ones in Table 2, which are based on industry value added. Also the last year of data in this table is 2016, while it is 2015 (the last year of India KLEMS data) in Table 2 and all other tables in the paper.
Source: Authors' calculations using data from Bolt *et al.* (2018); and The Conference Board Total Economy Database™ (Original version), April 2019.

Moreover, better economic coordination was inevitable for a new and unified democratic India, a nation with substantial economic, geographic, cultural, linguistic, and ethnic diversity that just came out of postcolonial chaos and the wounds of partition. In the first phase of postindependence economic policies, Indian policymakers opted to take the planning aspect of the Soviet model, along with limited participation of private investors, who were shielded against import competition. The regime featured significant commands and regulations on the economy including licensing and import substitution. Moreover, a prominent role was attributed to the state, with the expectation that the state could play an important role in transforming a low-income economy into a *self-sufficient and self-reliant* one. This regime, that span over first three decades after independence, is often considered as the socialistic phase of Indian economic policy.

According to the estimates by economic historian Angus Maddison, India's GDP growth was barely half a percentage during nearly half a century before independence and was negative during the 15 years before independence (see Table 1).[2] Although the GDP growth improved to about 4%, resulting in nearly 2% per capita income growth, during the first 15 years after independence, it slowed down to 3% in the subsequent 15 years of the socialist regime. Thus the annual growth averaged to about 3.5% during the first three decades after independence, often christened as the 'Hindu rate of growth'. Moreover, when compared with the rest of the world, India also has lost in terms of relative income levels, be it compared to a global frontier such as the United States, or a global average. The per capita income levels of average Indians decelerated from 27% of the global average in 1950 to 21% in 1964 and further down to just 15% in 1979. Compared to the United States, income levels dropped from 5.7% in 1950 to 4.2% in 1979.

The slow growth of the economy during the socialist regime has led to increasing skepticism over the success of state-dominated import-substituting policy regime in delivering its goals (see Bhagwati and Desai, 1970; Little *et al.*, 1970). This has led to a shift in policy thinking towards a more liberal regime, especially for trade and industry. The 1980s witnessed several reform measures that opened avenues for the private sector, and the beginning of the 1990s further signalled the opening up of the economy with significant removal of policy barriers. The period, considered as the market regime, is also known as the period of a turnaround in growth as India registered a near 5% growth in the 1980s. Moreover, the per capita income levels, relative to the global average has improved in the post-1980 market regime, currently reaching nearly 40%. Similarly, income levels relative to the United States have improved especially in the 2000s, now reaching almost 12%. The United States, a technology frontier nation, was moving ahead much faster than India over years.

The present paper undertakes a comparison of the proximate sources of economic growth – factor accumulation and total factor productivity – in India during the 1950–1980 periods, the so-called socialist regime, with that of the post-1980 period, which includes the pro-business reforms[3] in the 1980s and more aggressive pro-market reforms in the 1990s. The sources and determinants of economic growth have been studied in great detail for India (see Krishna, 2007, for a review of some of the important studies).[4] This paper adds to this vast literature by using a sectoral growth accounting perspective using two large datasets – the GGDC-10 sector database and the India KLEMS[5] – to analyse the sources of growth during the socialist regime of the 1950s and the market regime since mid-1980s. We document two essential features of India's growth dynamics. First, the overriding importance of the services sector in India's growth is not new, but it has always been the case in independent India. This is not a new insight. However, we look at the role of services sector by distinguishing between market and nonmarket services, which is hardly attempted in the past. Our results suggest that there has been a significant shift in the composition of service sector growth. While the socialist regime fostered more nonmarket services, including the government sector, the market services sector flourished in the market regime in terms of labour productivity, TFP and economic growth. Second, the economic growth in the socialist period was substantially driven by capital accumulation, except in the nonmarket services, whereas the market regime sees a combination of both productivity and capital accumulation. From a methodological perspective, the paper also uses improved estimates of growth accounting by using asset-wise disaggregated capital stock.

The paper is organized as follows. Section 2 documents the trends in productivity and output growth during the socialist regime. The growth dynamics of the market regime from the 1980s are examined in section 3. The assessment of the growth and productivity during the transition from Nehruvian Socialism to Market Liberalization is undertaken in Section 4. The final section summarizes our observations.

2. Productivity and Economic Growth in the Socialist Era

The economic policies during the first three decades of postcolonial India were driven by the notion of planning, influenced by the Soviet economic policies based on Fabian thoughts. Hence this regime, which spans roughly through 1950–1980 is often termed as the 'socialist regime' of Indian economic policy. The objectives of the planning strategy included rapid industrialization with emphasis on developing a strong investment goods sector, poverty alleviation, improving per capita incomes and an even distribution of income. Implicitly, these policies were attempting to induce a structural transformation in the economy, by attributing a central role to the public sector and heavy industries. Even though private sector investment was encouraged in the early phases of the policy regime, this was hardly driven by market choices. Instead, the policy choices of the planners have inflicted on private enterprises. Import substitution, export subsidies and stringent restraints on technology and investment cooperation with the rest of the world were important features of the policies during this regime - which kept India somewhat a closed economy. Substantial controls on capacity expansion and licensing requirements for manufacturing industries were also part of the policy strategy.

In this section, we analyse economic growth in the Indian economy, with a particular focus on proximate sources of growth – factor accumulation and total factor productivity (TFP) – in the socialist phase of India's economic development. Following the previous literature, we divide the socialist regime into two subphases: 1950–1964 and 1965–1979. The first subphase coincides with what Balakrishnan (2007) termed as the 'Nehru era', which spans the period of the formation of the planning commission in India, and the death of India's first prime minister Jawaharlal Nehru. The primary strategy and policy focus during this regime was improving physical infrastructures (Virmani, 1997). The second subphase featured significant quantitative controls and lack of faith in the private sector.

There have been studies in the past that documented India's GDP growth in the pre-1980s, but there is hardly any attempt to understand the relative roles of capital accumulation and productivity in driving

growth. Much of the studies on productivity in the Indian economy has been focusing on the post-1980 period (see for recent studies Erumban and Das, 2016; Das *et al.*, 2016; Krishna *et al.*, 2016; Goldar *et al.*, 2017), while a comparative picture of the post and the pre-1980 period is seldom available, particularly at sectoral level. The changes in the policy regime were expected to affect economic growth through both changes in the accumulation of factor inputs and changes in productivity. For instance, the controlled regime is often argued to have hampered productivity and efficiency in India's industrial sector (Bhagwati and Desai, 1970; Bhagwati and Srinivasan, 1975). There have been, however, some studies that attempted to explain the role of factor inputs and total factor productivity growth (TFPG) before 1980 (Dholakia, 2002; Bosworth and Collins, 2003; Guha-Khasnobis and Bari, 2003; Sivasubramonian, 2004; Virmani, 2004; Bosworth *et al.*, 2007). The findings of these studies often contradict each other. For instance, Guha-Khasnobis and Bari (2003) attribute the growth slowdown in the 1970s (see next section) to both TFP and capital slowdown, whereas Virmani (2004) argues that TFPG was the sole cause of the observed slowdown. These studies mainly focus on the total economy and are not without controversies in terms of quality of data and methodologies used (Krishna, 2007).[6] It may be noted that there have been a few studies analysing the sources of growth at a disaggregated sectoral level as well, but are primarily confined to agriculture sector and organized manufacturing industries (Ahluwalia, 1985; Ahluwalia, 1991; Dholakia and Dholakia, 1993; Balakrishnan and Pushpangadan, 1994; Kumar, 2001).[7]

The novelty of our analysis for the socialist regime is two-fold. The first is the use of a more appropriate measure of capital input. We measure capital stock at the individual asset level for three asset types – machinery, transport equipment and construction – after allowing asset-specific depreciation profile, thus allowing for asset heterogeneity. These stock measures are then converted into a flow of capital services using relevant weights derived using user costs of capital for each type of asset (see India KLEMS data manual). Our approach is, therefore, expected to provide more reliable estimates of the relative contribution of capital and TFPG to India's growth in the socialist regime. Second, we delve into the relative contributions of capital investment, employment generation, and TFP to GDP growth by broad sectors of the economy, including a distinction between market services and nonmarket services. As mentioned earlier, in several ways, the policy strategies in the mid-1950s were an attempt to induce structural change by expanding the heavy industrial sector. Therefore, it would be interesting to understand the productivity and factor accumulation dynamics at the sectoral level.

2.1 *Trends of Economic Growth in the Period 1950–1979*

First, we look at the growth rate of output – measured as gross value added (referred interchangeably as value added or output throughout this paper) – in four broad sectors of the economy. These are agriculture, manufacturing, other industries (mining, utilities and construction) and services, with the services sector further categorized into market services and nonmarket services. The market services include trade, hotels and restaurants, transport and storage, communication, and business services, and the nonmarket services are primarily health, education and government services.

During the socialist phase, the aggregate value added in the Indian economy grew at an average annual rate of 3.7% (Table 2). In the first subphase of this period, 1950–1964 (the 'Nehru era'), the annual growth of the aggregate economy was 4.4%, which had slowed to 3% in the second subphase.[8] Sivasubramonian (2004) identifies the first phase as a period of quick transformation from colonial rule to the moderate growth phase under economic planning, and the next subperiod as the phases of economic growth slowdown (See Krishna, 2007).

Two sectors that were dominant in the growth picture during the socialist regime were manufacturing and nonmarket services. These sectors grew respectively at 5.1% and 5.2% per annum during the 1950–1979 period. It is also interesting to note that the nonmarket services were growing at a faster rate by more than half a percentage point than the market services. Note that the Nehruvian policies also initiated massive programs on institution building, especially by creating higher education infrastructure, albeit

Table 2. Value Added Growth Rate: Broad Sectors, 1950–1979.

Broad industry description	1950–1964	1965–1979	1950–1979
Agriculture	2.8	1.1	1.9
Manufacturing	6.4	3.9	5.1
Other industries	6.3	3.6	4.9
Services	5.2	4.7	4.9
Market service	5.0	4.2	4.6
Nonmarket service	5.4	5.0	5.2
Total economy	4.4	3.0	3.7

Note: Other industries include mining, electricity, gas and water supply and construction sectors. All data are for financial years, that is for instance 1950 in the table corresponds to 1950–1951. Total economy and Services sector growth rates are value added share weighted average of sectoral growth rates. All growth rates are measured as log changes.
Source: Authors' calculations based on the GGDC 10 sector database.

the focus on primary education was given succinct attention. The emphasis on institution-building and development of education and health sectors during this period might have helped the rapid expansion of nonmarket services. Comparing the two subphases, the growth rates in all the broad sectors in the first subphase were higher than that in the second subphase.

To understand the relative roles of these different sectors in driving aggregate growth, we compute the contribution of individual sectors to the aggregate growth, by weighting individual sectoral growth by their relative share in total nominal value added. This allows us to capture the structure of the economy or the income distribution across the sectors in the growth analysis. The results are depicted in Figure 1.

The services sector was the engine of overall economic growth in the soclialist phase, which suggests that the economic growth in the independent India has been always driven by the services sector. In particular, the nonmarket services, which had relatively faster growth and a larger share in the economy was the most crucial contributor to growth followed by the agriculture. Looking at the two subphases, it becomes clear that it was the rapid slowdown in the agriculture sector, which had a relatively larger share in the economy that drove down the aggregate growth. Also, the manufacturing sector's contribution dropped notably during the second phase, while the services sectors – both market services and nonmarket services – somewhat maintained their relative contributions to growth.

2.2 *Sources of Economic Growth in the Socialist Regime*

We used the standard growth accounting approach to analyse the sources of growth (Jorgenson *et al.*, 1987).[9] In this approach, assuming competitive factor markets, full input utilization, and constant returns to scale, the growth of the value added is decomposed into contributions of factor inputs (such as capital and labour inputs) and TFP. In this section, we present the decomposition of the aggregate, and sectoral value added growth into contributions from capital services, employment and the residual TFPG.

Table 3 provides the growth rates of employment and labour productivity (output per worker). The employment growth averaged 2.2% in the total economy for 1950–1979 periods. Most jobs in this period were created in the manufacturing sector followed by agriculture and services. Interestingly, contrary to what we observed in the case of value added growth, market services dominated in creating additional jobs than the nonmarket services.

The high employment growth in the manufacturing sector, however, was confined only to the 'Nehru era' when it had an impressive growth of nearly 5%. In the post-Nehru era, however, the growth has slowed substantially to 1.7%, following a slowdown in value added growth, amid a heavily dirigisme industrial

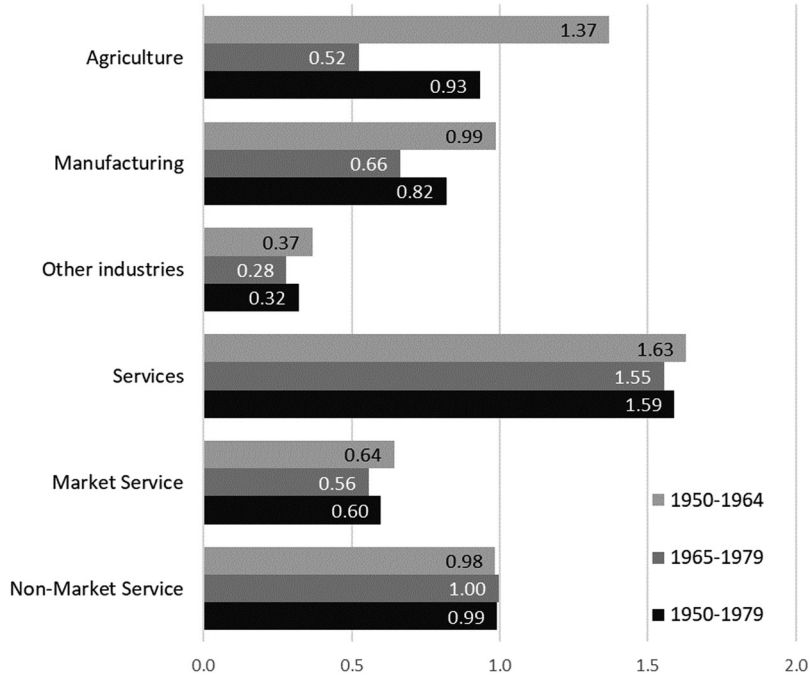

Figure 1. Contribution of Broad Sectors to the Aggregate Value Added Growth: 1950–1979.
Note: Sectoral contributions to aggregate growth are computed as the product of GDP growth in individual sectors (as reported in Table 2), and the average share of each sector in total nominal value added.
Source: Authors' calculations based on the GGDC 10 sector database.

Table 3. Employment Growth Rate: Broad Sectors, 1950–1979.

Broad industry description	1950–1964	1965–1979	1950–1979
Agriculture	2.1	2.4	2.3
Manufacturing	4.8	1.7	3.2
Other industries	–1.9	0.7	–0.6
Services	1.8	2.0	1.9
Market service	2.3	2.7	2.5
Nonmarket service	1.5	1.5	1.5
Total economy	2.2	2.2	2.2

Note: Other industries include mining, electricity, gas and water supply and construction sectors. All data are for financial years, that is for instance, 1950 in the table corresponds to 1950–1951. Growth rates are measured as log changes.
Source: Authors' calculations based on the GGDC 10 sector database.

and economic policy. While job growth somewhat stalled in nonmarket services, it improved in market services and also in agriculture. Moreover, given a relatively faster output growth than the employment growth in nonmarket services and in other industry group (that includes construction, utility and mining), these sectors seem to have had a poor rate of labour absorption or improvement in productivity. Overall,

Table 4. Labour Productivity Growth Rate: Broad Sectors, 1950–1979.

Broad industry description	1950–1964	1965–1979	1950–1979
Agriculture	0.7	–1.3	–0.3
Manufacturing	1.7	2.3	2.0
Other industries	8.2	2.9	5.5
Services	3.4	2.7	3.0
Market service	2.6	1.5	2.1
Nonmarket service	3.9	3.5	3.7
Total economy	2.1	1.0	1.6

Note: Other industries include mining, electricity, gas and water supply and construction sectors. All data are for financial years, that is for instance 1950 in the table corresponds to 1950–1951. Growth rates are measured as log changes.
Source: Authors' calculations based on the GGDC 10 sector database.

with a considerable decline in the growth of employment in the manufacturing sector, aggregate job growth remained weak in the second phase.

The Indian economy had an average labour productivity growth of 1.6% during the entire socialist regime, with 2.1% in the first subphase, which slowed down to a mere 1% in the second subphase (Table 4). Among the broad sectors, the other industries group had the highest labour productivity growth rates, perhaps due to high capital investment in the energy sector, followed by the services sector. Within the services sector, the nonmarket services were the main driver of labour productivity growth. Thus, while the growth in the nonmarket services during this period was productivity-driven, market services growth was driven by employment growth. Comparing the two subperiods, labour productivity growth has declined across the board, except for manufacturing. Comparing Tables 2, 3 and 4, we observe that about 3/4th of the manufacturing output growth came from faster job growth in the first phase, whereas in the second phase, nearly 60% of the growth was due to more rapid labour productivity growth. The growth slowdown in manufacturing, thus, features a shift in the relative roles of job growth and productivity. With negative productivity growth in agriculture and notable declines in services, overall productivity growth has declined. More than 3/4th of the growth in the aggregate economy in the second phase came from employment growth.

Having observed the trend in labour productivity growth, we now analyse the contribution of growth in employment, capital, and TFP to value added growth. We present growth accounting results for the entire period in Figure 2, and for the two subperiods in Table 5. In the aggregate economy, capital input contribution was the largest component of value added growth in the socialist era, followed by the contribution of employment growth. Faster growth of factor inputs than the value added growth makes the TFPG negative in the economy. At the broad sectoral level also, the growth in capital investment was the primary source of growth in manufacturing, other industries, and market services. TFPG had a sizable contribution in the nonmarket services, while in all other sectors, TFPG was negative, resulting in a deceleration of aggregate productivity. Thus, whatever growth India achieved in the socialist regime was due to the factor accumulation, and TFPG remained negative across all sectors, except in the nonmarket services. Moreover, these results underscore the dominant role of services, primarily nonmarket services, in driving aggregate productivity growth as well.

The sources of economic growth in the two subperiods are presented in Table 5. Factor accumulation was the major source of economic growth under both policy regimes. With a stagnant employment contribution and a moderate decline in capital contribution, a large part of the decline in value added growth in the second subphase was driven by rapid decline in TFPG.

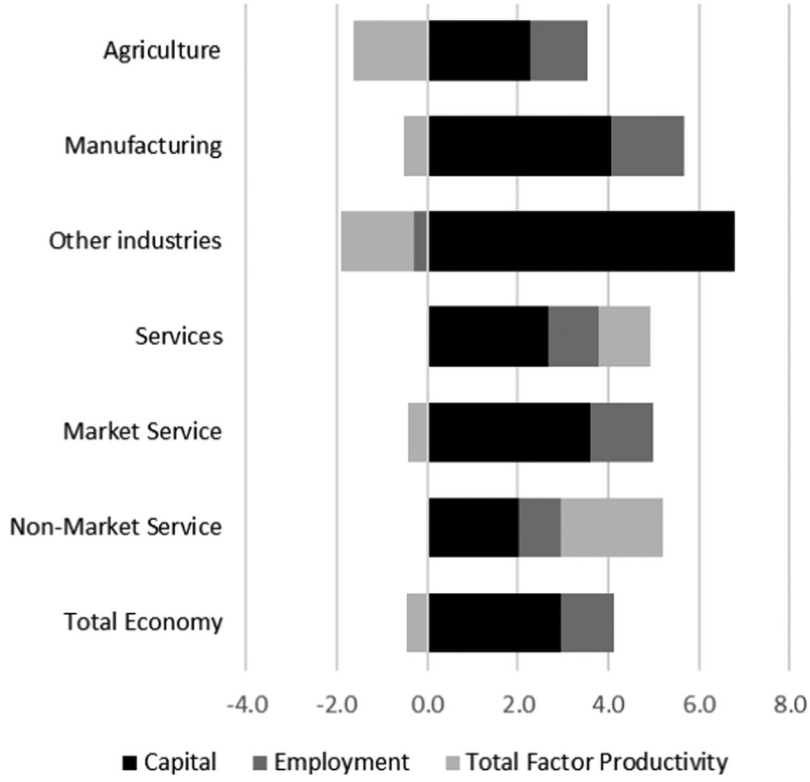

Figure 2. Sources of Value Added Growth: Broad Sector and Total Economy, 1950–1979.
Note: Other industries include mining, electricity, gas and water supply and construction sectors.
Source: Authors' calculations based on the GGDC 10 sector database and India KLEMS.

Table 5. Sources of Value Added Growth for Broad Sectors: 1950–1965 and 1965–1979.

	1950–1964				1965–1979			
	Value added growth	Contributions from			Value added growth	Contributions from		
		Capital	Labour	TFP		Capital	Labour	TFP
Agriculture	2.8	2.3	1.2	–0.7	1.1	2.3	1.3	–2.5
Manufacturing	6.4	4.8	2.5	–0.9	3.9	3.4	0.7	–0.2
Other Industries	6.3	9.8	–1.0	–2.5	3.6	4.0	0.4	–0.8
Services	5.2	2.8	1.1	1.3	4.7	2.5	1.1	1.0
Market service	5.0	3.5	1.3	0.1	4.2	3.7	1.4	–0.9
Nonmarket Service	5.4	2.3	0.9	2.2	5.0	1.8	0.9	2.3
Total economy	4.4	3.2	1.3	–0.2	3.0	2.7	1.1	–0.8

Note: Other industries include mining, electricity, gas and water supply and construction sectors.
Source: Authors' calculations based on the GGDC 10 sector database and India KLEMS.

Table 6. Sources of Value Added Growth: Comparison with Sivasubramonian (2004).

	GDP growth	Contributions from			
		Capital	Employment	Education	TFPG
Sivasubramonian (2004)					
1950–1964	4.2	1.1	1.0	0.2	1.8
1964–1980	3.1	1.3	1.2	0.1	0.4
Estimates in this study					
1950–1964	4.4	3.2	1.3	n.a	–0.2
1965–1979	3.0	2.7	1.1	n.a	–0.8

Note: Estimates in Sivasubramonian (2004) are based on the compound annual growth rate, and our estimates are based on log changes.
Source: Authors' calculations based on the GGDC 10 sector database; Sivasubramonian (2004).

Among the broad sectors of the economy, only nonmarket services had a positive TFP growth in both subphases. Output growth in the market services sector was sourced mainly from the capital in the first phase. Although the contributions of capital and employment improved marginally in the second phase, output growth in the market services sector slowed solely due to decelerating TFP growth. Similarly, the slowdown in the agriculture sector in the second subperiod was driven almost entirely by the productivity slump. In the manufacturing sector, however, productivity deceleration has somewhat eased, but a rapid decline in capital and employment contributions have driven the output growth down. In fact, the contribution of employment growth declined only in the manufacturing sector, whereas it either improved or remained unchanged in other sectors of the economy. The contribution of capital input also fell across the board in the second phase, except for market services and agriculture - while the former showed marginal improvement, the latter remained stable. Thus, it is apparent that although the TFP growth decline played a crucial role in slowing growth in most sectors, the decline in capital input also had a substantial role in lowering output growth across the board.

In a seminal study on India's economic growth, Sivasubramanian (2004) considers the nonresidential segment of the Indian economy from 1950–1951 to 1999–2000. He uses a growth accounting approach, using labour input (employment and education), land, and a measure of gross capital stock that consists of structures, equipment, and inventory. A comparison of our results with that of Sivasubramonian (2004) shows comparable output growth rates during 1950–1964 and 1965–1979 periods while the composition of contributions from factor input and productivity differs (Table 6). Our results suggest a larger capital contribution and negative TFP growth in both periods. In contrast, Sivasubramonian's results suggest positive and larger TFP growth in the first period and smaller yet positive TFP growth in the second period. The differences are mostly attributable to differences in capital contribution. We use detailed asset wise investment data since 1950 to construct a series of capital stock for each asset, which is then corrected for the differences between assets in terms of their cost shares, measured using asset wise depreciation investment prices, and an assumed real rate of return. Despite the differences in the relative importance of capital and TFP, both our results and the results from Sivasubramonian (2004) agree on the weakening total factor productivity growth in the second phase of socialist regime. A few earlier studies also observed a decline in TFPG in the second phase, compared to the first phase (Acharya *et al.*, 2003; Virmani, 2004).

What we take from our results is that economic growth in India has been traditionally driven by the service sector, with the nonmarket services being the major contributor in the socialist regime. Whereas the capital input has been the main proximate source of growth of value added in the three broad sectors

and the total economy, the role of TFPG has been dismal and was confined to nonmarket services. The changes in policy regimes affected the economic growth negatively in the second subphase, which is largely attributed to efficiency loss and also a minor decline in capital services. A deceleration in TFP is all sectors except nonmarket services, a fall or stagnation in capital investment growth across the board except in the market services, and a slowdown in job growth in most sectors were liable for the slowdown in output growth in the second subphase.

3. Growth Dynamics in the Post-1980s – The Market Regime

As observed in the previous section, the growth performance of the Indian economy has worsened by the 1970s. The socialist flavour of the Nehruvian policies was blamed for this by many (e.g., Bhagwati and Srinivasan, 1975). It has been argued that those policies limited the competition in the domestic market, made domestic firms inefficient by shielding them from foreign competition and limited a productivity-enhancing structural transformation by restricting the possibilities of resource reallocation to more productive sectors (Ahluwalia, 1991). The post-1980 period featured several pro-business reforms amid realizing that the controlled regime, often called the 'license raj' was not delivering the aspired results. Economic policies, particularly about trade, industry and public sector, were scrutinized by several committees, and some piecemeal attempts at industrial deregulation as well as trade policies were introduced in the mid-1980s. These policy changes included import liberalization, export incentives, exchange rate policies, and expansionary fiscal policy.[10] These reforms were argued to have a productivity-enhancing effect, as well as a demand-boosting effect facilitated by eased credit availability and high levels of public expenditure (Panagariya, 2005). The balance of payments (BoP) crisis of 1991–1992 had further changed the policy mindset, and complete overhauling of economic policies to a market economy was accomplished.[11] Significant lowering of tariff and nontariff barriers (trade policy reforms) along with a major revamping of industrial policies, especially the withdrawal of industrial regulation and liberalization of foreign direct investment (FDI) were introduced.

India's economic growth has improved in the post-1980s, which is often attributed to several of these reforms that facilitated a shift from socialist to a market regime. Further, barring the transition years of the early 1990s– from a pro-business to a market economy – economic growth has improved markedly during the post-1990 period (see Ahluwalia, 2006). The growth dynamics in the pro-business/pro-market regime has been subject to substantial research in the past, offering various explanations including the role of savings and investment, a distinction of pro-market versus pro-business orientation of the government and the rising role of private sector and external sector (Panagariya, 2005; Acharya, 2006; Kohli, 2006a,2006b; Rakesh Mohan, 2008; Rodrik and Subramanian, 2004; Nagaraj, 2013; Mohan and Kapur, 2015).

In this section, we examine the growth and productivity dynamics from 1980 till 2015, i.e., the pro-business/pro-market phase of India's policies. We divide the entire time period into four subphases (1980–1992; 1993–2001; 2002–2007 and 2008–2015) in order to assess the impact of policy changes that have taken place post-mid-1980s and 1991. This section follows largely the sequence of the last section but uses more detailed sectoral data. In addition to the sectoral classification we used in the previous section – agriculture, manufacturing, other industries, market services, and nonmarket services – we further divide manufacturing into consumer goods, intermediate goods and investment goods, and also provide the breakdown of other industries into mining, electricity, gas and water supply and construction.

3.1 *Growth and Productivity Post-1980s: Broad Sector Perspective*

In Table 7, we provide the growth rate of value added in broad sectors of the economy in the market regime. During the 35 years since 1980, the total economy grew at an average rate of 6% per annum. This has largely been achieved through near to 8% growth in the period 2002–2007, often dubbed as

Table 7. Growth Rate of Value Added in Broad Sectors – 1980–2015.

Broad industry description	1980–1992	1993–2001	2002–2007	2008–2015	1980–2015
Agriculture	2.8	3.3	2.1	2.3	2.7
Manufacturing	7.5	6.0	10.7	8.5	7.9
• Consumer goods	6.2	5.4	5.8	10.6	6.9
• Intermediate goods	8.1	4.9	11.8	7.1	7.7
• Investment goods	8.3	9.1	16.1	8.4	9.9
Other industries	4.1	4.1	7.7	3.3	4.5
• Mining	6.6	3.3	0.2	5.8	4.5
• Utilities	9.3	10.0	10.0	1.2	7.7
• Construction	0.5	1.3	9.9	3.1	2.9
Services	5.8	7.6	8.9	8.2	7.3
• Market services	5.4	9.5	12.6	9.9	8.7
• Nonmarket services	6.2	5.5	3.8	5.9	5.5
Total economy	5.0	5.7	7.7	6.5	6.0

Note: All aggregates are a weighted average of sectoral results, using value added weights.
Source: Authors' calculations based on the India KLEMS database version (2017).

the 'golden growth' period (Mohan and Kapur, 2015). Though the growth has slowed to 6.5% during 2008–2015 – the postglobal financial crisis period – it still remains higher than the pre-2002 growth rates, which were 5%–6% on average.

Among all sectors of the economy, the investment goods manufacturing and market services had the highest growth rates, close to 9%–10% during the whole period. While the investment goods sector has consistently maintained a high growth at above 8% over the subperiods, the growth performance of the market services sector was relatively less impressive in the 1980s compared to most other sectors. Among the three subgroups of the manufacturing sector, consumer goods witnessed the best performance with double-digit growth during the 2008–2015 period, while its growth rate was somewhat hovering around 5%–6% from 1980 till 2007. Intermediate goods-producing industries, on the other hand, registered an impressive growth throughout, except in the 1990s, with the growth being the highest during the 2002–2007 period. Both investment and intermediate goods sectors had their best growth in the 2002–2007 period. In fact, in the pro-market regime, all sectors, except agriculture, consumer goods, mining, and nonmarket services, registered their highest growth during the 2002–2007 period. Agriculture has been consistently maintaining an average growth rate in the range of 2%–3%, except during 1993–2001 periods, when its growth was relatively higher at 3.3% than other periods.

The observed sectoral growth rates, especially in the industrial sector, reflect, to a large extent, the impact of reforms in economic policies on trade and industry. Services growth, mainly driven by the market services, on the other hand, may reflect the effect of privatization of several services and also regulatory measures adopted in the sector (see Prasad and Sathish, 2010).

In Table 8, we look at the relative contributions of different sectors to the aggregate value added growth. For the whole period, the largest contribution to output growth comes from the services sector, primarily market services, followed by manufacturing. The role of the services sector in driving the overall growth has been dominant in every time period since the 1980s. While the role of agriculture declined over time - after remaining stagnant for much of the 1980s and 1990s its contribution to overall growth fell sharply in the 2000s – that of manufacturing somewhat stagnated at 1.5%. After an uptick during the 2002–2007 period, the contributions of the investment goods, as well as the intermediate goods manufacturing, have declined in the postglobal financial crisis years.

Table 8. Sectoral Contribution to Aggregate Value Added Growth Rate – 1980–2015.

Broad industry description	1980–1992	1993–2001	2002–2007	2008–2015	1980–2015
Agriculture	0.9	0.9	0.4	0.4	0.7
Manufacturing	1.4	1.2	2.0	1.5	1.5
• Consumer goods	0.5	0.4	0.3	0.6	0.5
• Intermediate goods	0.6	0.4	1.0	0.6	0.6
• Investment goods	0.3	0.4	0.6	0.4	0.4
Other industries	0.5	0.5	1.1	0.5	0.6
• Mining	0.2	0.1	0.0	0.2	0.1
• Utilities	0.2	0.3	0.3	0.0	0.2
• Construction	0.0	0.1	0.8	0.3	0.2
Services	2.2	3.2	4.2	4.1	3.2
• Market services	0.9	2.1	3.4	2.9	2.1
• Nonmarket Services	1.3	1.1	0.8	1.2	1.1
Total economy	5.0	5.7	7.7	6.5	6.0

Source: Authors' calculations based on the India KLEMS database version (2017).

The results of our growth accounting exercise, which decomposed the value added growth in each of the individual sectors into contributions from labour and capital inputs and TFP, are provided in Tables 9A and 9B. Unlike the previous section, where we only considered employment, capital services, and TFP, in this section, we could also estimate the contribution of worker quality – or the compositional changes of workers in terms of skill attainment.[12] By far, looking across all sub-periods, capital input emerges as the most dominant source of overall growth both at the economy level as well as for broad sectors except in construction sector. Improvements in TFP appears as the second-largest source of overall growth for consumer as well as investment goods manufacturing, and the utility sector. TFP growth in intermediate goods-producing sector and agriculture were dismal, whereas it was negative in mining and construction sectors. Two segments of the services sector – market and nonmarket sectors – both had high TFP growth, on average, though still lower than the contribution of job growth.

The aggregate economic growth in the first decade after the initiation of pro-business reforms in the 1980s was driven by factor accumulation - both capital and labour (including labour quality) inputs were contributing substantially higher than the TFPG during the 1980–1992 period. TFPG was positive but dismal in most sectors, except for investment goods and nonmarket services. Construction and mining sectors had notable productivity deceleration. The capital contribution was high in mining and utilities, but also in intermediate and investment goods-producing sectors.

In the immediate years after the 1991 market reforms (1993–2001), value added growth ticked up by less than one percentage point, with both capital and TFP contributions boosted up. While the nonmarket services' TFPG declined in this period, market services, utilities, mining, investment goods and agriculture all saw improving productivity growth. Manufacturing as a whole had a negative TFPG, as both consumer and intermediate goods sectors had decelerations.

In the pre-global financial crisis years of early through the mid-2000s, output growth accelerated, with TFPG overtaking the contribution of employment. Much of the TFPG gain came from market services, but manufacturing, except for consumer goods, also registered a very high TFPG. The postcrisis growth slowdown during the 2008–2015 periods was prominently due to declining TFPG, which happened primarily in the market services, all segments of other industry group, and manufacturing except for substantial productivity gains in consumer goods sectors.

Table 9A. Sectoral Contribution to Aggregate Value Added Growth Rate – 1980–2015.

Broad industry description	1980–1992					1993–2001				
	Value added	Employment	Labour quality	Capital services	TFP	Value added	Employment	Labour quality	Capital services	TFP
Agriculture	2.8	0.8	0.2	1.6	0.2	3.3	0.3	0.2	1.7	1.2
Manufacturing	7.5	0.9	0.5	5.2	0.9	6.0	0.8	0.3	5.8	–1.0
• Consumer goods	6.2	0.9	0.4	4.1	0.8	5.4	0.8	0.3	4.9	–0.6
• Intermediate goods	8.1	1.0	0.4	6.4	0.2	4.9	0.7	0.2	6.8	–2.8
• Investment goods	8.3	0.8	0.8	5.1	1.6	9.1	1.2	0.2	5.7	2.0
Other industries	4.1	3.6	0.5	3.8	–3.8	4.1	1.8	0.3	2.5	–0.5
• Mining	6.6	1.5	0.4	7.5	–2.8	3.3	0.1	0.3	1.5	1.4
• Utilities	9.3	1.1	0.4	5.4	2.3	10.0	0.1	0.5	3.1	6.4
• Construction	0.5	5.9	0.5	1.0	–6.9	1.3	3.4	0.2	2.5	–4.8
Services	5.8	2.1	0.6	2.1	1.0	7.6	2.0	0.3	3.2	2.1
• Market services	5.4	2.6	0.5	2.9	–0.5	9.5	2.2	0.3	4.3	2.7
• Nonmarket Services	6.2	1.8	0.7	1.6	2.1	5.5	1.7	0.3	2.0	1.4
Total economy	5.0	1.6	0.4	2.7	0.2	5.7	1.3	0.3	3.2	0.9

Note: All aggregates are a weighted average of sectoral results, using value added weights.
Source: Authors' calculations based on the India KLEMS database version (2017).

In the market regime, while the dominant role of capital in driving growth was visible throughout, TFPG also had a solid contribution to growth in several sectors. However, the role of TFPG has changed over different subperiods. Much of the volatility in TFPG was emanating from market services but also changes across subsectors of the manufacturing. Thus, the growth dynamics in the Indian economy has been driven by market services in the market regime, which made India one of the fast-growing economies of the world, especially since the early 2000s.

Table 10 shows the TFP growth for the aggregate service sector as well as disaggregated industries observed for the period 1980–2015. The TFP growth of services is 1.6% for the full period, with the highest growth registered in the period 2002–2007, a period of India's high growth phase of close to 8% per annum. The telecom sector observed the highest growth rate around 11% for the period 1980–2015, despite a declining trend in the period beginning 2008. It is also significant to note that the service sectors showed a decline across all sectors (except financial services) in the period of India's growth slowdown as well as the global financial crisis. The market services as a group make a larger contribution to aggregate TFP in comparison to the nonmarket services.

Overall, in the post-1980 era, the market services as a whole had a negative TFP growth only during the 1980–1992 period and never after that. On the contrary, the TFP growth has weakened in the nonmarket services in the post-1980 period and had turned negative in the 2000s. Clearly, the dominance it enjoyed in the socialist regime in driving growth, but also in contributing to aggregate TFP growth has waned in the market regime. However, a closer look at the story suggests that the TFP success of market services is confined mainly to telecom and financial services sectors, while the traditional sectors like trade, hotels,

Table 9B. Sectoral Contribution to Aggregate Value Added Growth Rate – 1980–2015.

Broad industry description	2002–2007					2008–2015				
	Value added	Employment	Labour quality	Capital services	TFP	Value added	Employment	Labour quality	Capital services	TFP
Agriculture	2.1	–0.1	0.3	2.1	–0.2	2.3	–1.2	0.4	2.6	0.5
Manufacturing	10.7	0.7	0.2	6.1	3.7	8.5	0.6	0.3	5.1	2.5
• Consumer goods	5.8	0.8	0.3	5.4	–0.7	10.6	–0.1	0.3	2.7	7.7
• Intermediate goods	11.8	0.5	0.1	5.8	5.4	7.1	0.4	0.2	6.5	0.0
• Investment goods	16.1	0.9	0.3	7.8	7.2	8.4	1.8	0.3	5.3	0.9
Other industries	7.7	3.7	0.4	4.6	–1.0	3.3	4.3	0.3	3.6	–4.9
• Mining	0.2	0.0	0.8	6.8	–7.3	5.8	–0.2	0.7	6.7	–1.5
• Utilities	10.0	–0.5	0.3	3.2	6.9	1.2	0.5	0.0	5.3	–4.6
• Construction	9.9	6.5	0.3	4.3	–1.2	3.1	6.8	0.2	2.1	–6.0
Services	8.9	1.7	0.4	4.3	2.5	8.2	1.3	0.4	5.0	1.5
• Market services	12.6	2.1	0.3	4.9	5.2	9.9	1.5	0.4	6.5	1.5
• Nonmarket services	3.8	1.1	0.6	3.3	–1.2	5.9	1.1	0.5	2.9	1.4
Total economy	7.7	1.4	0.4	4.3	1.6	6.5	1.1	0.4	4.4	0.5

Note: All aggregates are a weighted average of sectoral results, using value added weights.
Source: Authors' calculations based on the India KLEMS database version (2017).

Table 10. TFP Growth Rate of Service Sector Industries for 1980 to 2015.

	1980–1992	1993–2001	2002–2007	2008–2015	1980–2015
Total services sector	1.0	2.1	2.5	1.5	1.6
Market services	–0.5	2.7	5.2	1.5	1.8
Trade	0.2	2.3	0.7	–3.9	–0.1
Hotels and restaurants	–4.7	5.2	–0.9	–3.9	–1.3
Transport and storage	–1.7	2.4	3.9	0.7	0.8
Telecommunication services	–7.3	10.5	37.1	17.9	10.6
Financial services	2.4	–0.1	5.1	5.9	3.0
Business services	–0.3	3.4	1.0	1.8	1.4
Nonmarket services	2.1	1.4	–1.2	1.4	1.2
Public administration	2.1	3.9	1.9	5.5	3.3
Education	1.6	1.1	–2.6	0.3	0.5
Health and social work	–1.8	2.6	–4.8	–3.2	–1.5
Other services	2.5	–0.1	–2.0	–0.1	0.5

Source: Authors' calculations based on the India KLEMS database version 2017.

and restaurants had negative TFP growth on average.[13] Since the global financial crisis, the trade sector seems to have hit heavily, which had negative TFPG. Perhaps, the slowdown in Western economies has hampered the incomes in the information technology (IT) services sector in India, affecting the trade sector output and productivity. The upper-middle-income consumers, which included IT professionals, were an important supportive force, especially for the organized retail sector. Similarly, hotels and restaurants, an important component of the tourism sector, also had negative TFPG, except during the 1993–2001 period. One sector that had consistent negative TFP growth in this period is construction. This is not surprising given the fact that the job creation in sectors like manufacturing, especially in the formal segment of manufacturing, has been limited. Workers seemed to have moved to the construction sector, where the skill requirements were minimal, and the nature of the job was mostly informal. Since the output in this sector did not grow in proportion, the marginal productivity of these workers was trivial, fostering a negative TFP growth. Two other sectors, utilities and mining had swung in TFP growth over the years. However, the share of these sectors in the overall economy is not large enough to make a notable impact on the aggregate economy.

4. Nehruvian Socialism to Market Liberalization – An Assessment of Growth and Productivity

In the preceding sections of this paper, we documented the growth and productivity dynamics of the Indian economy during the last six and a half decades. Such an attempt is not new for India, but an additional aspect of our research is to detail the proximate source of economic growth in the postindependence period, with broad sectoral data for the pre-1980 period and detailed sectoral data for post-1980 period. Moreover, the measures of capital input – a weighted growth rate of asset-specific capital stock – we use are theoretically pertinent compared to most previous studies. We also make a distinction between market services and nonmarket services while analysing the service-driven growth in India. In this section, we summarize the major observations from a comparative perspective of socialist vs. market regimes in terms of the role of services versus manufacturing in driving growth, achieving a better distribution of income under democratic administration, and finally the relative roles of factor accumulation versus TFP growth in driving output growth.

4.1 *The Changing Roles of Sectors in Driving Growth*

The choice of a closed economy policy regime during the first three decades after India's independence doesn't seem to have fully achieved its objectives; the economy registered abysmally low growth rates during the socialist regime. A striking feature of the dismal aggregate growth, however, is that most sectors of the economy, bar agriculture, performed reasonably well. Despite the good performance of manufacturing and nonmarket services, the economy as a whole witnessed an abysmally low growth as the agriculture sector, which constituted almost half the GDP, did perform poorly. Much of the slowdown happened in the second half of the socialist regime, 1965–1980, during which the agricultural sector has lost its prominence substantially, and manufacturing growth slowed. Since the first wave of pro-business reforms in the early 1980s, growth started improving, with manufacturing seeing a turnaround. With subsequent market-friendly policies in the 1990s and 2000s, the economy gained further momentum, and in particular, the services sector flourished. An important shift in the sources of growth within services was underway – a shift from the nonmarket services in the Soviet period to market services in the market regime. With the service-led growth, India became one of the fastest-growing countries in the world, especially in the 2000s.

Although the service sector has historically been and continues to be the dominant sector that drives productivity and growth in Indian economy, our results suggest an interesting internal shift within the

service sector. Productivity growth – both labour productivity and TFP – in the services sector was substantial and positive in the Nehruvian era but was entirely driven by nonmarket services. Often it is also argued that India's productivity growth was service driven even during the colonial period. For instance, Broadberry and Gupta (2010) show that the productivity gap between India and the United Kingdom was narrower in the services sector, and productivity performance in the services sector was much better than other sectors during the colonial times. They attribute this to the bias in educational institutions towards higher education, which created a minority of highly educated population working in the services sector. The system also deterred the educational prospects for the lower caste population within India's caste pyramid, thus leaving the majority of them working in sectors where educational requirements are nearly zero, such as the farm sector. A significant shift, however, we see in the postmarket regime is a rapid swing to market services from nonmarket services. This is perhaps, a result of gradual withdrawal of government from several service provisions on the one hand and the increased space for private businesses on the other.

4.2 *Democracy, Growth and Inequality*

When looked in retrospect, the Nehruvian socialist growth in India was indeed lower compared to the postmarket regime. But, the slow GDP growth during that period was not entirely unexpected, though not anticipated to sustain for such a long period. In the introduction to the first 5-year plan, economist KN Raj projected a slow growth for the first 20 years after independence, which according to historical evidence, was, among others, driven by the conviction that democracy takes longer to deliver (Government of India, 1952; Krishnakumar, 2004). Economists differ in their view about the impact of democracy on economic development. While some dismiss the importance of democracy for growth (eg Barro, 1997), others argue that it generates stable and high-quality growth, with better distribution (Rodrik, 2007).[14] In a recent paper, Acemoglu *et al.* (2019) provide empirical evidence for sizable positive effects of democracy on economic growth in a large number of countries. An important takeaway from this researches is that the shift from nondemocracy to democracy brings positive results in the long run, while the short-term gains are unlikely. But can that alone defend India's dismal growth in more than a quarter of a century? Perhaps not.

Another argument often found in the literature is that Indian policymakers opted not to compromise on democratic principles, but to achieve equitable growth within the constraints of the economy (Kannan, 2011). Interestingly, the preferred distributional aspects of India's policy choices were less visible in the market regime, when the income distribution started favouring the upper part of the population. Along with the low growth in the overall economy, and average incomes, the possession of national income by the bottom half, and more importantly the middle class have increased during the first 30 years, while that of the top 10%, and in particular the top 1% has declined (see Figure 3). In contrast, the pro-market reforms, while delivered impressive growth in the post-1980s, particularly in the 2000s, also accompanied by a rapid decline in the middle-class income shares. The middle 40% share in income has dropped from 45% in 1981 to a historically low 29% in 2015 (also see Chancel and Piketty, 2017). On the contrary, the share of the wealthiest 10%, which declined by nearly 10% between 1951 and 1981 to about 30%, has increased persistently since the 1980s, reaching 56% in 2015. Apparently, while there was little to distribute in the Soviet regime, it was relatively better distributed, while as the economic pie has gone up in the market reform period, the distribution has become more uneven.

4.3 *Perspiration versus Inspiration*

From a supply-side growth accounting perspective, GDP growth can be improved either by adding more workers to the process of production or by improving worker productivity. And the latter can be attained

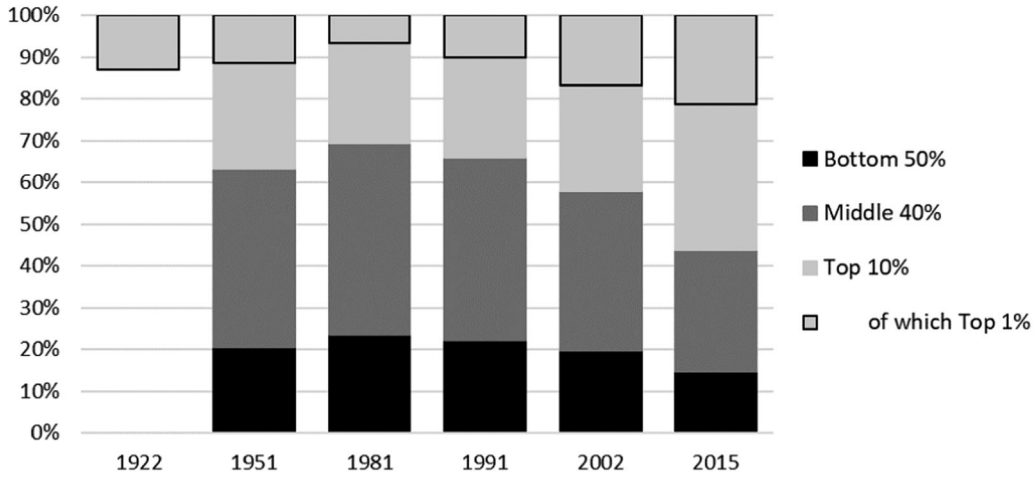

Figure 3. Pretax National Income Share in India.
Source: World inequality database, https://wid.world/country/india/.

by making workers work with more capital – capital accumulation – or by improving the total factor productivity (see Erumban and van Ark, 2018). In the first phase of the pre-1980 period, on average more than 60% of GDP growth came from increased jobs, while the remaining 40% from labour productivity improvement. But this has varied across sectors; while productivity was important in nonmanufacturing industries and nonmarket services, job creation was more prominent in manufacturing and agriculture sectors. In the second phase, however, the role of productivity has increased in manufacturing, and growth became mostly jobless.

However, the labour productivity surge in the manufacturing was a result of intensive investment accumulation, as evidenced by negative total factor productivity growth in the sector in both subphases. Except in the services sector, that too only in the nonmarket services, TFPG has not been a positive contributor to growth in any of the subsectors of the economy during the socialist regime. On the contrary, TFP growth was positive in all the major sectors, except in construction and mining, in the market economy regime. It has been observed by previous literature that the workers released from the agricultural sector are absorbed mainly in the construction sector due to less skill requirements in the sector, adding nearly no marginal productivity (Das *et al.*, 2016). Obviously, the accumulation of capital during the socialist period has not rendered productive economic growth, whereas the reforms in the post-1980 period seemed to have helped several industries improve their productivity performance.[15]

An earlier study by Bosworth *et al.* (2007) has analysed India's growth experience by sectors, using a growth accounting approach. They provide estimates of contributions of physical capital, land (only for the agricultural sector and total economy), education and TFPG to labour productivity growth in agriculture, industry (including manufacturing), manufacturing, and services sectors during the period from 1960–2004. A comparison of our sectoral growth accounting with Bosworth *et al.* (2007) is provided in Table 11. Note that a strict comparison between the two is not feasible, as the period of analysis differs between the two studies.[16] We compare the results from Bosworth *et al.* (2007) for 1960–1980 with our results for 1965–1979 – the premarket regime – and their results for 1983–1993 and 1993–1999 – the market regime –with our results for 1980–1992 and 1993–2001, respectively. Both in the post and pre-market regimes, our TFP results for the aggregate economy are smaller by 1.5%–2%. Our TFP estimates are also lower in agriculture, manufacturing, and services sectors in all the three sub-periods.

Table 11. Sources of Labour Productivity Growth: Comparison with Bosworth *et al.* (2007).

Boseworth *et al.* (2007)						Estimates in this study*				
Period	Labour productivity	Capital deepening	Land	Education	TFP	Period	Labour productivity	Capital deepening	Labour quality	TFP
Total economy										
1960–1980	1.3	1.0	–0.2	0.2	0.2	1965–1979	1.0	1.8		–1.2
1983–1993	2.9	0.9	–0.1	0.3	1.7	1980–1992	2.0	1.4	0.4	0.2
1993–1999	5.8	2.4	–0.1	0.4	2.8	1993–2001	3.3	2.1	0.3	0.9
Agriculture										
1960–1980	0.1	0.2	–0.2	0.1	–0.1	1965–1979	–1.3	1.2		–2.5
1983–1993	1.5	0.2	–0.1	0.2	1.2	1980–1992	1.4	0.9	0.2	0.2
1993–1999	2.4	0.7	0.1	0.3	1.3	1993–2001	2.7	1.4	0.2	1.2
Manufacturing										
1960–1980	2.0	1.5		0.3	0.2	1965–1979	2.3	2.5		–0.2
1983–1993	3.9	1.3		0.4	2.1	1980–1992	5.1	3.7	0.5	0.9
1993–1999	5.5	4.6		0.6	0.3	1993–2001	3.6	4.3	0.3	–1.0
Services										
1960–1980	2.0	1.1		0.5	0.4	1965–1979	2.7	1.7		0.7
1983–1993	2.7	0.3		0.4	2.0	1980–1992	2.0	0.5	0.6	1.0
1993–1999	7.0	1.5		0.5	4.9	1993–2001	4.0	1.6	0.3	2.1

Note: *Our periodization does not match with Bosworth *et al.* (2007). In our analysis, the first period is 1950–1979; second period is 1980–1992 and the last period is 1993–2001 (see notes to Table 1).
Source: Authors' calculations based on the GGDC 10 sector database and India KLEMS database version 2017; Bosworth *et al.* (2007).

Two exceptions are the services sector in the pre-1980 period, where our TFP was slightly higher, and the agriculture sector in the post-1993 period where our estimates were quite comparable to Boseworth *et al.* (2007). The lower TFP growth in our estimates can be attributed to better estimates of capital contribution, that accounts for asset heterogeneity. In all the sectors, our capital estimates show higher contributions, and the impact is larger in the manufacturing sector. Our approach to incorporate capital assets separately, attributing differing asset prices and depreciation rates, seems to have a sizable impact on the measured TFP growth, as it assigns the contribution of capital more accurately to capital input, rather than burying it in the residual TFP. Besides, there are differences in labour productivity growth rates, part of which is due to our double deflation approach to value-added growth, which accommodates the intermediate price changes.

Barring the differences in the precise numbers that emanate from methodological and data differences and the differences in periodization, the narrative that comes out of our analysis remains comparable with that of Bosworth *et al.* (2007). Both studies suggest a dismal productivity growth in the pre-1980 period in the aggregate economy and the three subsectors. Capital deepening shows a higher role in driving growth in the pre-1980s, compared to TFP growth.

Several factors are responsible for the weak productivity growth in the socialist regime, including the inability of firms to absorb new technology in a regime that restricted the import of foreign technology, institutional weaknesses, bureaucratic controls and lack of innovation. Moreover, the dominant role attributed to the public sector has adversely affected the incentive system. Unlike in a privatized economy, the lack of target, direction, and accountability in the state-owned enterprises might have fuelled inefficiency. The absence of market forces also seems to have led to the misallocation of resources to less

Table 12. Reallocation Effects, Aggregate Labour Productivity Growth.

	1950–1964	1965–1979	1980–1992	1993–2001	2002–2007	2008–2015
Aggregate labour productivity	2.0	0.7	2.9	4.1	6.2	5.8
Sectoral contribution	2.1	1.0	2.0	3.3	4.8	4.3
Reallocation effect	–0.1	–0.4	0.9	0.8	1.4	1.5

Note: Sectoral contribution is the total economy labour productivity growth obtained as value added weighted average of labour productivity growth at the individual sector level. These are the results reported in Tables 2 and 12.
Source: Authors' calculations based on the GGDC 10 sector database and India KLEMS database version 2017.

productive uses. In Table 12, we provide the results of a simple calculation of factor reallocation effects of labour productivity across sectors. The reallocation effect is calculated as the difference between aggregate labour productivity growth and sectoral labour productivity growth aggregated using value added shares. The effect has been negative during the 1950–1979 period, suggesting output expansion in sectors with a relatively lower level and growth of labour productivity. In the post-1980 period, however, the reallocation effect has turned positive, suggesting better allocation of resources in more productive sectors, apparently nurtured by market forces. Moreover, the importance of reallocation has been increasing consistently in the market regime. A similar observation has been made by Bosworth *et al.* (2007) that the role of factor reallocation in driving aggregate productivity was higher and increasing during 1980–2004 compared to the 1960–1980 period.

The weak productivity performance in the socialist regime, even when capital accumulation continued to grow, seem to be evidencing the inherent inefficiencies of the system. The implication was the creation of an economy that was driven by perspiration (capital accumulation) rather than inspiration (productivity). The neoclassical economic theory suggests that growth will not be sustainable if driven by factor accumulation due to diminishing returns. For instance, drawing on the findings of Young (1992) and Kim and Lau (1994), Krugman (1994) has questioned the East Asian growth miracle, which, according to him, was growing faster by accumulating more input. He argued that growth coming from perspiration would not be sustained longer, and hence if growth continues to rely on capital accumulation, the diminishing returns to capital would hinder its sustainability, as happened in the case of the Soviet Union.

While the Indian experience shares a weak TFP growth in the socialistic regime with the experience of East Asian economies, there is an interesting contrast between the East Asian experience and India's growth narrative. The growth in East Asian economies was remarkable, although it was driven by investment in human and physical capital (Young, 1994, 1995), while that was not the case in India. The Indian experience was a combination of weak growth (in contrast to East Asian economies) but driven by factor accumulation (in line with East Asian economies) – weak and unsustainable growth. Moreover, Indian growth narrative during this period was featured by the lack of market forces – as in the case of former the Soviet Union – while that was not the case in the East Asian economies. The competition was alien to the India economy, as the protected domestic economy helped inefficient incumbent firms to control the market. Thus the poor growth performance of the socialist regime became problematic, as it was inefficient and unsustainable,[17] which came to near collapse as investor confidence eroded substantially on the verge of a significant balance of payment crisis in the 1990s. The failure of the regime, hence, was not in delivering growth per se, but more in sustaining a continued growth path.

5. Summary and Conclusion

The paper has undertaken an examination of the sources of economic growth in India for the period 1950–2015, a period of 65 years partitioned into two phases. The first is 1950–1979, phase of Nehruvian

socialist pattern of development based on trade policy of import substitution and state-led development. The period beginning 1980s saw India change its economic orientation towards a globalized economy with a lowering of trade-related barriers- both tariff and quantitative protection and deregulated industrial set up.

Two important observations come out of our analysis. The first is the dominant role of nonmarket services, which includes the government sector, in driving India's economic growth and productivity in the socialist regime, while the market services, especially telecommunications and financial services, triggered much of the growth in the market regime. The services sector has always been a dominant driver of growth in India, but our analysis reveals a compositional shift within the services sector between the socialist and market regime.

The second is the overriding reliance on capital accumulation as a source of India's growth in the socialist regime. Again, an exception is the nonmarket services, which is the only sector that had a positive TFP growth in the socialist regime. Moreover, in the second phase of the regime, both the capital and TFP contributions to growth has slowed substantially, across the board. Thus, while the continued deceleration of TFP in the second phase of the socialist period affected the sustainability of growth, the decline in investment contribution to growth also indicates the weakness of the system in stimulating capital-driven growth. In the market regime, the importance of TFP growth has increased, although to varying degrees across sectors and over time. Growth in the market regime was a result of a combination of both TFP and capital accumulation. Our estimates also provide a more accurate picture of the role of proximate sources of India's growth, and the sectoral composition of growth and productivity in the two regimes, as we use measures of capital input compared to previous studies.

The analysis undertaken in this study is based on a neoclassical growth accounting approach. It is to be admitted that economic problems are beyond just economics, as perceived by the classical economists of all types – be it, Karl Marx or Adam Smith – who looked at economic issues from a broader institutional perspective. The neoclassical sources of growth – factor accumulation and productivity growth that is measured using the growth accounting approach should, therefore, be seen as proximate determinants of growth (see Maddison, 1988; Rodrik, 2003). More ultimate and more profound determinants that help or deter these proximate factors include institutions, geography, trade openness, etc. (see Rodrik, 2003). It is imperative to develop appropriate institutions that are essential for propelling and sustaining growth in the long-term. For instance, Acemoglu *et al.* (2002) have highlighted the role of institutions that secure property rights.

Having argued that the harsh controls in the socialistic regime restricted the potential for productivity growth, one should also acknowledge that several institutions, including higher education institutions, were founded during this period. The development of educational institutions has a generational impact in facilitating the 'assimilation' of technology.[18] The British colonial rule left India intellectually deficient, as a large portion of the population remained uneducated and deprived of scientific thinking. Without Nehruvian vision of developing higher education institutions, it is doubtful if India would have been able to achieve the faster productivity growth rates it obtained in the postmarket reform periods. The positive effects of several institutions that were built during the Nehru era would have come through later years, and as the economy became more market-friendly, the market forces might have been better able to tap the benefits from those institutions. Subsequent research should focus on understating the role of several ultimate factors that explain the observed pattern of productivity and growth in various policy regimes, which would help us understand the direction to which policies should further move ahead. However, such an attempt is beyond the scope of this paper.

This, however, does not defy the several institutional weakness India still suffer from, and the fact that given the size of its population, it still has a long way to go in developing its human capital. Despite realizing the need for human capital and institution building (Government of India, 1952), primary education and literacy were not given ample space in the early policy strategies, which had long-term consequences.

Similarly, the constitution of India developed during the Nehruvian era, considered property rights as a fundamental right. The idea of secure property rights is a complex issue, as it pertains not just to physical properties, but also the intellectual property. Despite the constitutional provisions, even today, India remains relatively weak in the overall property rights index (International Property Rights Index, 2008).

Moreover, several challenges still remain for India to further consolidate the gains from the market reforms undertaken since the 1990s. One of the main issues which concern India remains job creation. The postcolonial industrialization strategies, both the socialistic and the pro-business/pro-market ones, have been less successful in job creation particularly in the manufacturing sector. The manufacturing sector has not been able to absorb the workforce released by agriculture, as hypothesized by standard structural transformation literature. Industrial growth in India has been quite capital intensive. Moreover, there is a large informal sector, which accounts for roughly 80% of manufacturing jobs. The early policy focus on heavy industries failed to recognize the importance of competition and the role of labour-intensive industries in creating jobs and demand. In the later periods, as the strict labour market regulations persisted, firms increasingly opted for the substitution of machinery for labour on a large scale, eventually hampering job prospects (Sen and Das, 2015) and accelerating informalization of the economy. With a population, which is relatively younger than most mature and emerging market economies, creating jobs is of high importance for the Indian economy. However, the conventional smokestack manufacturing job creation is less feasible, as manufacturing technology has advanced so much, and unskilled worker intensity has declined. Given that the services sector is also increasingly becoming skill-intensive investing in human capital is an inescapable policy requirement. India still remains relatively less integrated to global value chains, which adds to the challenge of job creation in medium and small-sized firms.

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Notes

1. Later literature, however, has questioned the sustainability of that model in the long run (see Krugman, 1994).
2. Based on this, Nayyar (2006) argues that economic growth during 1950–1980 was respectable when compared to pre-1950 India as well as countries of the world at similar levels of development and was impressive during 1980–2005.
3. Rodrik and Subramanian (2004) make a distinction between the reforms in the 1980s and those in the 1990s. They consider the shift in the policy attitude in the 1980s were pro-business, compared to more structural pro-market reforms in the 1990s.
4. Krishna (2007) reviews four major studies on economic growth in India, which are Dholakia (2002), Guha-Khasnobis and Bari (2003), Sivasubramonian (2004) and Virmani (2004). He argues that though there are differences in time-periods of studies as well as methodologies undertaken, productivity as one of the determinants of growth and its estimates does not diverge across studies. Also there have been several studies that compare India's growth performance with that of China, comparing the differences in policy approach, structural transformation, and productivity growth (Bardhan, 2012; Bosworth and Collins, 2008; Wu *et al.*, 2017).

5. The data that support the findings of this study are publicly available in India KLEMS database (https://rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=43504) and GGDC-10 sector database (https://www.rug.nl/ggdc/productivity/10-sector/)
6. For instance, Virmani (2004) used the working age population as a proxy for employment, and most studies use an aggregate measure of capital stock, without taking asset heterogeneity into account, and also often without correcting for depreciation.
7. Bosworth and Collins (2008) provide estimates for 1978–1993 period, both for the aggregate economy and three broad sectors, but the period roughly corresponds the pro-business policy regime.
8. As mentioned earlier these numbers differ from those in Table 2, because the aggregate growth rates in Table 2 are value added weighted average of sectoral value added growth rates.
9. The growth decomposition used in this section is based on the following relationship: $\Delta \ln Y_i = \alpha\iota.\ \Delta \ln L_i + (1-\alpha_i).\Delta \ln K_i + TFPG_i$. Y_i is the real value added in any given sector i, L is the total number of employees, and K is the aggregate capital services. Δ represents the change between current and previous period, and α is the labour income share in nominal value added, averaged across current and previous periods. Aggregate capital service growth rate is computed as a weighted growth rate of capital stock in three individual asset types - machinery, transport equipment, and construction – using appropriate depreciation rates and user cost of capital (see India KLEMS data manual version 2017, available at www.rbi.org). Total factor productivity growth (TFPG) is measured as a residual after subtracting contributions of capital and labour from value added growth. A more sophisticated version of this approach is used in the next section, where labour input is divided into a quantity component (total employment) and a quality component (educational composition of workers), which is not attempted for the pre-1980 period due to lack of data. See Appendix for a detailed discussion on the data and variables.
10. The reforms of the 1980s can be listed as following – (1) expansion of the open general licensing list, (2) decline in share of canalized imports, (3) expansion of export incentives, (4) relaxation of industrial controls and (5) adoption of more realistic exchange rate regime. For details, please see economic survey 1985–1986, government of India as well as Panagariya (2005).
11. The Government of India's economic survey of 1991–1992 lists all the reforms initiated by the government in 1991–1992. Also see Ahluwalia (2002).
12. With the inclusion of labour quality, the growth accounting equation, explained in footnote 9, changes to $\Delta \ln Y_i = \alpha_\iota.\ \Delta \ln L_i + \alpha_\iota.\ \Delta \ln LQ_i + (1-\alpha_i).\Delta \ln K_i + TFPG_i$, where LQ is the measure of labour quality. All data used in this section and the previous section are taken from the India KLEMS database. As explained earlier, in the abovementioned equation, Y is gross value added and thus the decomposition used here is based on a value added production function. However, with the India KLEMS database, it is also possible to estimate the sectoral TFPG using a gross output production function. A gross output production function is more appropriate at the sectoral level, as intermediate inputs are important contributors to production. However, we have not done so in this paper, in order to keep consistency with the pre-1980 estimates presented in the previous section. It was not possible for us to use a gross output function for the pre-1980 period, due to lack of data.
13. Bosworth et al (2007) differentiate services sector between traditional and modern services, with the former consisting of trade, transport and other services, and the latter consisting of telecom, finance, business, education and health services. They do not examine the sources of growth in these sectors, but they do examine the contribution of these sectors to aggregate service sector growth. The traditional sector contributes the larger portion of service sector growth in both pre- and post-1980 period. However, the importance of modern sector has increased in the post-1980 period. Overall, they conclude that the growth in the services sector has been very broad based. Our grouping of the services into market and nonmarket sector is not strictly comparable to this traditional versus modern

grouping, but we also find supportive evidence of traditional sector performing poorly in terms of productivity growth in the post-1980 period.

14. Often it is observed that authoritarian governments will succeed in implementing politically tough, but economically relevant policies, which will foster growth. But those arguments often overlook the unsustainability of such a model in the long run, as the accountability of governments in such systems is hardly existent.
15. The importance of capital in driving growth in the pre-1990 period was observed earlier by DeLong (2003). He argued that India's growth in this period was rather normal; it was not extraordinary as in East Asia, but not worse as in Africa either.
16. Note that our approach has also some other differences with Bosworth et al. (2007). First, we differentiate between three different types of capital and hence capture the compositional effect of capital, an aspect Bosworth et al. (2007) acknowledges to be important. Second, we do not have land as an asset in our capital data. Third, while we include the educational composition of workers as a qualitative factor input in our post-1980 analysis, we do not have education in our analysis for the Nehruvian period.
17. The question of growth sustainability from the neoclassical growth perspective is, however, not free from dispute. The very existence of an aggregate economy production function, which is the underlying assumption used in many past studies, including that of Young (1994) in the case of East Asia, is often criticized (see eg Felipe and McCombie, 2003). However, our approach to work with more detailed sectoral data, especially for the post-1980 period, helps us tackle the issue of technological heterogeneity across sectors to some extent. Moreover, we also include human capital in our measures while accounting for growth.
18. Nelson and Pack (1999) have argued that investment in human capital was one of the important features of East Asian growth that facilitated the assimilation of technology and new capital.

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Appendix: Data and Variables

The analysis of the study uses mainly two databases: the Groningen Growth and Development Centre (GGDC) 10 sector database and the detailed India KLEMS data. All our data for the post-1980 period are taken from the India KLEMS. The GGDC database provides real and nominal value added by sectors for India from 1950 till 2012. We use the trend in sectoral value-added data from this source for the period 1950–1979. For the post-1980 period, all our data is based on India KLEMS. Therefore, in order to maintain consistency between the two databases, we apply the changes in value added data for each broad sector and aggregate economy for years before 1980, obtained from the GGDC, to the 1980 levels in the India KLEMS data.

Similarly, GGDC provides the employment data by sectors only from 1960 onwards. For the 1960–1980 period, we extrapolated backward the level of employment in 1980, obtained from India KLEMS, using the growth rates from the GGDC data. For 1950–1959, when there is no GGDC data available, we created the data by combining the Conference Board's Total Economy Database (TED) with the sectoral estimates by Sethuraman (1974). Sethuraman (1974) had estimated employment for the three broad sectors of the economy, that is agriculture; mining, manufacturing, construction and utilities and services in 1950 and 1960. For the post-1980, the data on employment and composition of employment and wages are based on India KLEMS, which constructs the series using National Sample Survey Organization's employment and unemployment surveys, with usual principal and subsidiary status (UPSS) definition.

The labour quality measures are obtained as the difference between total employment growth, and weighted growth rate of employment by skill types – primary, secondary and tertiary-educated workers – with the weights being their respective shares in wage compensation. Capital service growth rates are constructed using detailed asset wise investment data since 1950, obtained from the Central Statistical Organization (CSO). These data have been provided by the CSO to India KLEMS project and has been used to construct a long series of capital stock using the perpetual Inventory Method. Three different asset types are considered – machinery, transport equipment and construction. Real investment in these asset types since 1950 is added to the depreciated stock of initial capital in 1950, constructed under a steady-state assumption.