Productivity Dynamics and Rural Industrialization in India*

Aradhna Aggarwal+ and Takahiro Sato#

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Abstract

This paper examines the effects of firms' dynamics on the rural industrialization in India during the period from 2000-01 to 2005-06 using plant level panel data drawn from *Annual Surrey of Industries*. The paper focuses on productivity differences between continuing, entering and exiting firms. The empirical analysis is based on decomposition techniques of aggregate productivity growth (Baily, Hulten and Campbell 1992, Griliches and Regev 1995, Foster, Haltiwanger, and Krizan 2001, Balwin and Gu 2003, Olley and Pakes 1996, and Melitz and Polanec 2009). Results show that labor productivity and total factor productivity at the aggregate level increased during the reference period and that the aggregate productivity growth is supported by the productivity improvement of the continuing firms, the entry of productive firms, and the exit of less productive firms. The firms' productivity dynamics contributed the current rural industrialization in India.

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+ National Council of Applied Economic Research (NCAER), Parisila Bhawan, 11, Indraprastha Estate, New Delhi -110002, India

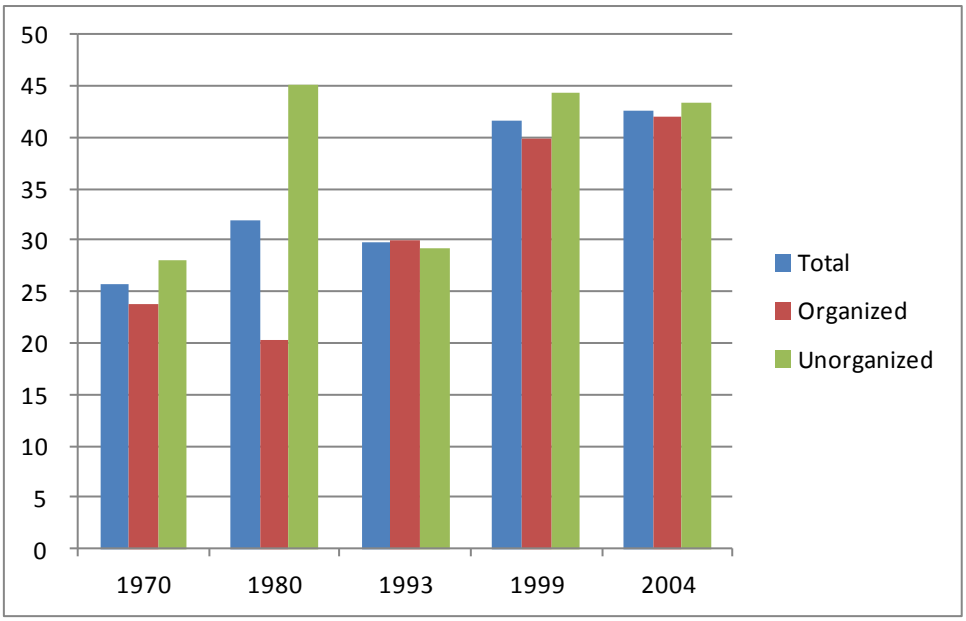
Research Institute for Economics & Business Administration (RIEB), Kobe University, Rokkodai, Nada, Kobe 657-8501 Japan.

Email: takahirodevelop@gmail.com

1. Introduction

Since the late 1990s, the industrialization in rural India has been progressing. According to the figure 1 which shows Net Domestic Product (NDP) of both rural and urban manufacturing sectors estimated by Central Statistical Office (CSO), the share of the rural NDP increased to 32% in 1980 from 26% in 1970, and decreased by 2% points from 1980 to 1993. It, however, have increased 10% points from 1993 to 1999 and slightly increase from 1999 to 2004. In 2004, the rural share was 43%.

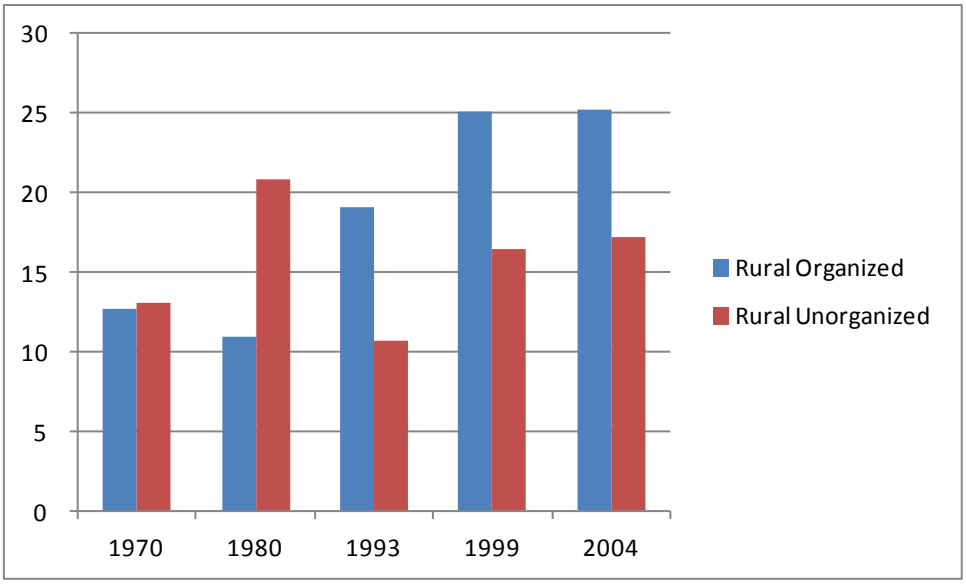
Figure 1: Rural Share of Net Domestic Product (NDP) of Manufacturing Sector



Source: Central Statistical Office, *National Account Statistics*, various years.

Figure 2 shows the share of NDP of unorganized and organized manufacturing sectors in rural areas. According to the figure, since 1993, each share increased significantly. In 1993, the size of rural organized sector became greater than that of rural unorganized sector. The size of rural organized sector reached around 25% in 1999 and 2004. Therefore, it can be said that since the late 1990s the industrialization in India has been driven by rural organized manufacturing sector.

Figure 2: Share of Net Domestic Product (NDP) of Organized and Unorganized Manufacturing Sectors in Rural Areas



Source: The same as in Figure 1.

This paper examines the effects of firms' dynamics on rural industrialization in India using plant level panel data drawn from *Annual Surrey of Industries* in order to investigate the characteristics of rural industrialization in India in recent years. Empirical analysis is limited to the period from 2000-01 to 2005-06 due to the data availability. In particular, the paper focus on productivity differences between continuing, entering and exiting firms. The hypothesis is that firms' entry and exit generate positive and significant productivity effects at the productivity growth in rural India. By following Aggarwal and Sato (2011), and Kamiike, Sato and Aggarwal (2012), the empirical analysis is based on decomposition techniques of aggregate productivity growth (Baily, Hulten and Campbell 1992, Griliches and Regev 1995, Foster, Haltiwanger, and Krizan 2001, Balwin and Gu 2003, Olley and Pakes 1996, and Melitz and Polanec 2009).

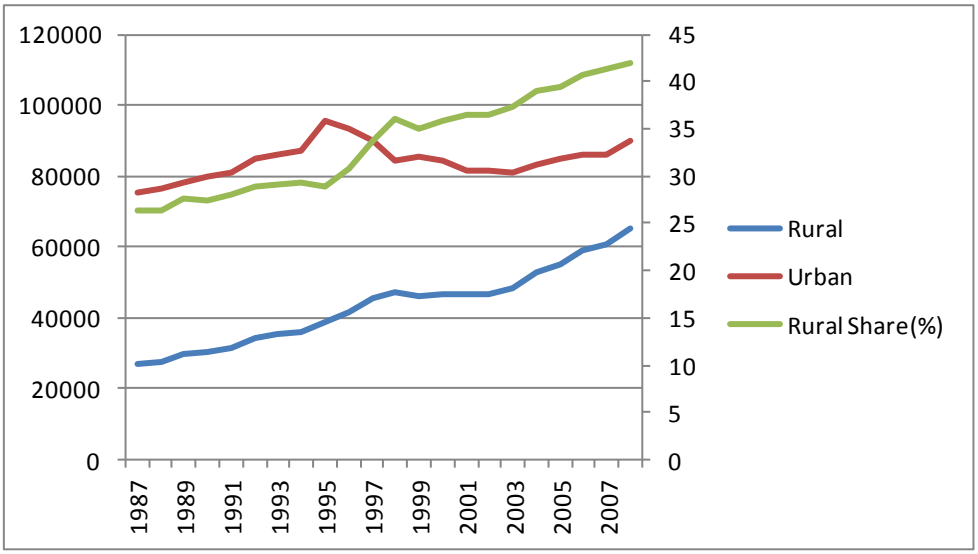
The rest of the paper is organized as follows: Section 2 provides an overview of the current rural industrialization in India at the aggregate level. Section 3 presents the empirical methodology and the data, and investigates the effects of the firms' dynamics on productivity growth of manufacturing sectors in rural area. Section 4 offers some concluding remarks.

2. Overview of the Rural Industrialization in India

The definition of ``rural area'' is regarded as non-``urban area''. According to the Census 2001, the definition of ``urban area,'' is as follows: (a) All statutory places with a municipality, corporation, cantonment board or notified town area committee, etc. (b) A place satisfying the following three criteria simultaneously: (i) a minimum population of 5000; (ii) at least 75% of male working population engaged in non-agricultural pursuits; and (iii) a density of population of at least 400 per sq. km. (1000 per sq. mile)[1]. It is noted that the following figures drawn from *Annual Survey of Industries* are based on the above definition on rural and urban areas.

Figure 3 shows the number of factories in organized manufacturing sectors during the period from 1987 to 2008. From the figure, the following three findings can be pointed out. First, the number of factories in rural areas has been increasing over the long term though it stagnated during the period from the late 1990s to early 2000s. Second, the number of factories in urban area can be seen to reach the peak in the late 1990s. The absolute number had been greatly reduced until the early 2000s. It increased in the late 2000s, but it still have not recovered the peak level of the 1990s. Third, to reflect the above trend, there is an increasing trend of the rural share from 26% in 1987 to 42% in 2008.

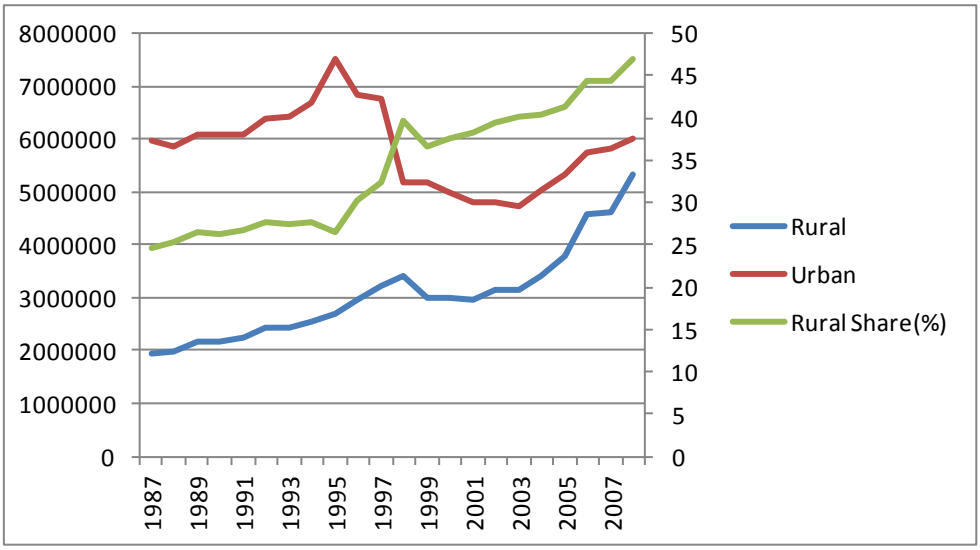
Figure 3: Number of Factories of Organized Manufacturing Sectors in Rural and Urban Areas



Source: EPW Research Foundation (2007) and Central Statistical Office, *Annual Survey of Industries*, various years.

[1] http://censusindia.gov.in/Metadata/Metada.htm#2b

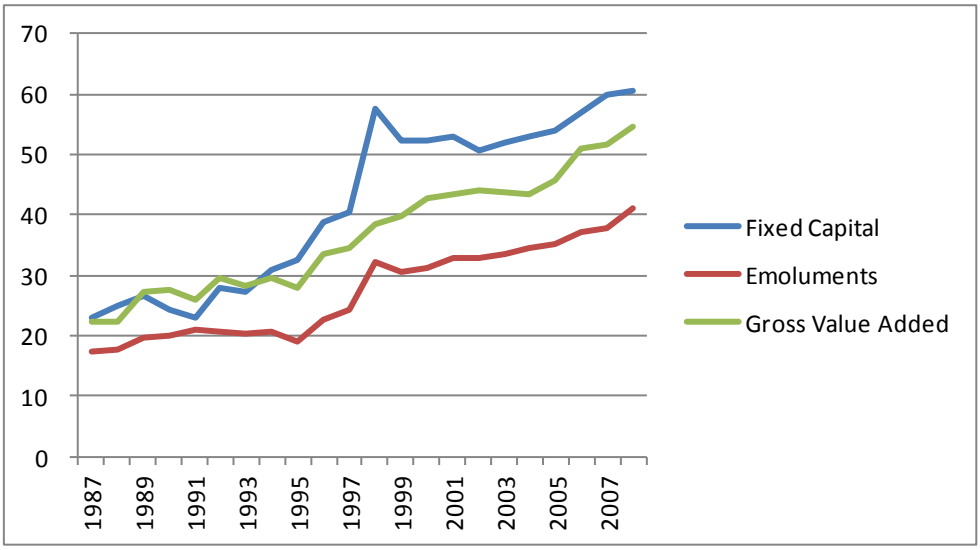
Figure 4: Number of Total Persons Engaged in Organized Manufacturing Sectors in Rural and Urban Areas



Source: The same as in Figure 3.

Figure 4 shows the total number of total persons engaged in organized manufacturing sectors. The employment in both rural and urban areas declined in terms of absolute numbers from the late 1990s to the early 2000s. But, since the late 2000s, employment in rural area increased significantly. The trend of rural share has increased from 25% in 1987 to 47% in 2008.

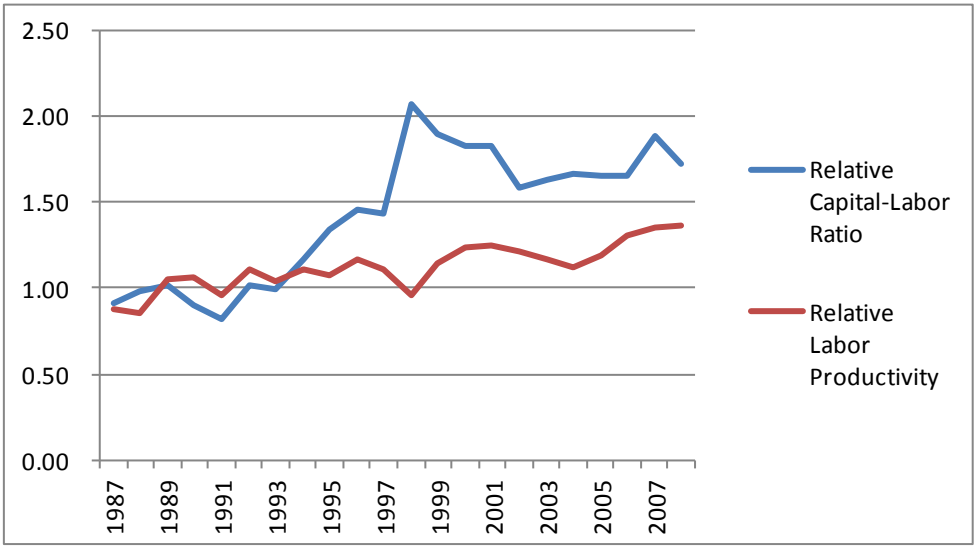
Figure 5: Rural Share of Fixed Capital, Emoluments and Gross Value Added of Organized Manufacturing Sectors (%)



Source: The same as in Figure 3.

Figure 5 indicates rural share of fixed capital, emoluments and gross value added of organized manufacturing sectors. It is noted that since the late 1990s the rural share has increased. In particular, the rural share of fixed capital and gross value added has overcome the urban share since the end of 2000s.

Figure 6: Relative Capital-Labor Ratio and Relative Labor Productivity of Organized Manufacturing Sectors



Source: The same as in Figure 3.

Figure 6 indicates rural-urban ratio of both labor productivity and capital-labor ratio. The numerical number is defined as the ratio of rural to urban. From the figure, we see the relative upward trend in favor of rural areas. That is, both labor productivity and capital-labor ratio increases more than in rural than in urban. It also noted that since the late 1990s both figures have been greater than 1. That is, it strongly suggests that there is a high possibility that capital-intensive industries are driving force for the development of rural industrialization in India in recent years.

3. Empirical Analysis on Firms' Dynamics and Productivity Growth

3.1. Empirical Method

Empirically, the dynamics of productivity growth are captured by productivity decomposition methodologies. Several decomposition methods are offered in the literature to assess sources of industry productivity growth. These methodologies decompose productivity growth between two points in time into the contribution from four broad factors: (1) improvement in continuing firms' productivity; (2) reallocation of resources from less productive to more productive producers; (3) entry of more productive firms; and (4) exit of less productive firms. The methodologies thus link macro productivity growth with micro firms' and productivity dynamics.

Baily et al. (1992) was the first study to propose decomposition of productivity into the contributions of continuing, entering and exiting plants (BHC methodology). They defined aggregate productivity as the output-weighted ($\theta_{f,t}$) average of the productivity of individual plants ($A_{f,t}$). The aggregation of productivity is defined by a weighted average of productivity levels:

$$A_t = \sum_{f}^{n_t} \theta_{f,t} A_{f,t}$$

Difference of aggregate productivity is defined by

$$\Delta A_t = A_t - A_{t-1}.$$

Using this, they proposed the following methodology (BHC), to decompose aggregate productivity growth:

$$\Delta A_t^{BHC} = \sum_{f \in S} \theta_{f,t-1}\, \Delta A_{f,t} \quad + \sum_{f \in S} \left(\theta_{f,t} - \theta_{f,t-1}\right) A_{f,t} + \sum_{f \in N} \theta_{f,t} \left(A_{f,t} - A_{t-1}\right) + \sum_{f \in X} \theta_{f,t-1} \left(A_{t-1} - A_{f,t-1}\right)$$

In the above equation, the Sets S, N, and X, respectively, represent the set of continuing, entering, and exiting plants during the periods from t-1 to t. The first term measures the effect of plant-level productivity changes, weighted by the initial share. The second term which sums changes in shares using a plant's productivity as weight captures the reallocation effect. The last two terms capture reallocation driven by new plants entering and others exiting.

An alternative is provided by Griliches and Regev (1995). Their methodology is as under

$$\Delta A_t^{GR} = \sum_{f \in S} \bar{\theta}_f\, \Delta A_{f,t} \quad + \sum_{f \in S} \Delta\theta_f \left(\bar{A}_f - \bar{A}\right) + \sum_{f \in N} \theta_{f,t} \left(A_{f,t} - \bar{A}\right) + \sum_{f \in X} \theta_{f,t-1} \left(A_{f,t-1} - \bar{A}\right)$$

This methodology will be referred to as GR throughout the text of this study. In this formula a bar over a variable indicates the average of the variable over the base and end years. All productivity terms (except for within-effects) are expressed as average productivity of two years.

Foster et al. (2001) modify the BHC methodology. Like BHC, Foster et al. (2001) also expresses all productivity changes as differences from aggregate productivity in t-1. In addition, they decomposed the second term of BHC into a 'pure between effect', weighing the change in shares by the relative productivity in the initial period and a covariance term. This methodology will be called as FHK in this study.

$$\Delta A_t^{FHK} = \sum_{f \in S} \theta_{f,t-1}\, \Delta A_{f,t} \quad + \sum_{f \in S} \Delta\theta_{f,t} \left(A_{f,t-1} - A_{t-1}\right) \quad + \sum_{f \in S} \Delta\theta_{f,t}\, \Delta A_{f,t} + \sum_{f \in N} \theta_{f,t} \left(A_{f,t} - A_{t-1}\right) \quad + \sum_{f \in X} \theta_{f,t-1} \left(A_{t-1} - A_{f,t-1}\right)$$

This decomposition has five terms that show the contribution of various components to aggregate productivity change. The difference between the final two is

called the net entry effect. In this formula an entering plant contributes positively only if it has higher productivity than the initial average and an exiting plant contributes positively only if it exhibits productivity lower than the initial average. GR measures their distance from the average productivity of both, the initial and end years.

Olley and Pakes (1996) proposed an entirely different approach, referred to OP hereafter. They defined aggregate productivity as the average of the productivity levels and decomposed it in two terms as follows:

$$A_t^{OP} = \widetilde{A_t} + \sum(\theta_{f,t} - \widetilde{\theta_t})\left(A_{f,t} - \widetilde{A_t}\right) = \widetilde{A_t} + \mathrm{cov}(\theta_{f,t}, A_{f,t})$$

where $\widetilde{A_t} = \frac{1}{n_t}\sum_{i=1}^{n_t} A_{f,t}$ and $\widetilde{\theta_t} = \frac{1}{n_t}\sum_{i=1}^{n_t} \theta_{f,t}$. The first term is the un-weighted simple productivity average and the second term captures allocation efficiency i.e. to what extent 'above average size' firms have 'above average productivity'. This decomposition distinguishes between the contributions of productivity improvements and reallocation but does not allow us to distinguish between contributions of surviving, entering and exiting. Melitz and Polanec (2009) extended this decomposition to assess the contribution of entering and exiting firms to productivity growth. This methodology is termed as "dynamic Olley and Pakes" method (hereafter referred to as DOP in this study). They challenged the FHK and GR decomposition methodologies on the grounds that their choice of reference productivity values for entering and exiting firms, and the use of fixed weights in distinguishing between contributions of productivity improvements and market share reallocation of surviving firms has mixed up various effects and hence introduced bias in the measurement. In order to eliminate these biases, they used Olley-Pakes decomposition and modified it capture firms' dynamics. It is given by

$$\Delta A_t^{DOP} = \Delta\widetilde{A_{S,t}} + \Delta\mathrm{cov}(\theta_{S,t}, A_{S,t}) + \theta_{N,t}\left(A_{N,t} - A_{S,t}\right) + \theta_{X,t-1}(A_{S,t-1} - A_{X,t-1})$$

where $\theta_{g,t}$ and $A_{g,t}$ represent the aggregate market share and aggregate productivity of group g in period t.

There are two major differences between the components of the above methodology and those of FHK and GR. First, both entry and exit effects in this methodology are weighted by corresponding overall market shares. The other two

decompositions compare aggregate productivity of entering and exiting firms to either aggregate productivity of all firms in initial period (FHK) or the un-weighted time average of aggregate productivity of all firms (GR). Second, this methodology does not assign weights to productivity change of continuing firms (within plant effects) as the other two methods and follow instead the approach of Olley-Pakes decomposition, and define reallocation only when covariance between market share and productivity increases. Third, mathematically, the three methodologies may yield very different results depending on features of firms' dynamics in the data. In an industry where the productivity of continuing firms is growing, FHK decomposition yields lower contribution of exiting firms than the DOP, whereas the opposite holds for the GR decomposition. Further, both FHK and GR decompositions yield smaller contribution of surviving plants and larger contribution of entering plants as compared with DOP. Finally, the within effects are inflated in FHK and GR due to the use of weights in measuring these effects, which according to Melitz and Polanec (2009) captures a part of reallocation effect.

Clearly, there are a wide range of estimates in the literature. Foster et al. (2001) shows that the results are sensitive to the choice of methodology, time-period, and productivity measure. The present study uses three methodologies of decomposition for the robustness of the results. These are: GR, FHK and DOP.

3.2. Methodology and Data

The most frequently applied measures of productivity are: labor productivity (LP) and total factor productivity (TFP). As the latter accounts for the distinct effects of capital/labor inputs together with technological progress, it is often seen as favorable. The present study also uses both LP and TFP for the analysis.

The aggregate LP is measured as a weighted average of plant level productivity. It is defined as:

$$LP_t \equiv \sum_{f}^{n_t} \theta_{f,t} \, LP_{f,t} = \sum_{f}^{n_t} \theta_{f,t} \left(\frac{GVA_{f,t}}{L_{f,t}}\right)$$

The aggregate TFP is defined as:

$$TFP_t \equiv \sum_{f}^{n_t} \theta_{f,t} \, TFP_{f,t} = \sum_{f}^{n_t} \theta_{f,t} \left(\frac{GVA_{f,t}}{K_{f,t}^{\hat{\alpha}} L_{f,t}^{\hat{\beta}}}\right)$$

Weight (θ): Different parameters have been used as weights in the existing literature. These are: share of revenue, output, labor, value added, or costs. Foster et al. (2008) assert that the choice of weight is "an open question". The most common choices are either output (or revenue) weight or employment weight. Following the traditional literature, we have used 'gross value of output' weight in the present study.

Real Gross Value Added (GVA): We obtain GVA using double-deflation method as follows:

GVA= (gross value of output)/(wholesale price index)-(total input)/(input price index)

Gross value of output (GVO) is deflated by the wholesale price index of drugs and medicines while inputs are deflated by the input price index. The input price index is constructed as the weighted average of fuel price, material price, and other input prices. Fuel price, material price and other input prices are constructed using wholesale prices, implicit deflator of national account statistics and weights from input-output tables. The data sources we use for constructing input price index are: Reserve Bank of India, *Handbook of Monetary Statistics of India* and *Database on Indian Economy*; Central Statistical Office, *Input-Output Transaction Table* and *National Account Statistics*.

Labor (L): Man-hours of workers are used to measure labor input.

Capital (K): Capital is defined as initial value of net fixed capital deflated by the implicit deflator of net capital stock in the resisted manufacturing sector. The data sources of the implicit deflator are: Central Statistical Office, *National Account Statistics*, various years.

Elasticity of Production with respect to Production Factor($\hat{\alpha}, \hat{\beta}$): Semi-parametric estimation technique proposed by Levinsohn and Petrin (2003) which addresses the endogeneity problem is used in order to estimate Cobb-Douglas production function defined as $\ln GVA = a + \alpha \ln K + \beta \ln L + e$. The data set which we use for the estimation is unbalanced unit-level panel data of 6 years from 2000 to 2005.

Our empirical application is based on plant or ''factory'' level data for the period 2000-01 to 2005-06, which is collected by the Central Statistical Office of India in the Annual Survey of Industries (ASI). The primary unit of enumeration in the survey is a

factory in the case of manufacturing industries, and data are based on returns provided by factories. The present study uses data on various plant level production parameters such as output, sales, labor, employees, capital, materials and energy.

The ASI factory frame is classified into 2 sectors: the 'census sector' and the 'sample sector'. The sample sector consists of small plants employing 20 to 99 workers if not using electricity and 10 to 99 workers if using electricity. The census sector comprises relatively large plants. It covers all units having 100 or more workers and also some significant units which although having less than 100 workers, contribute significantly to the value of manufacturing sector's output. While the units in the census sector are approached for data collection on a complete enumeration basis every year, sample sector units are covered on the basis of a well designed sampling. The present study focuses only on the census sector data for the decomposition analysis. This is because the productivity decomposition analysis requires a consistent and exhaustive database to distinguish between continuing firms, entrants and exiters. A challenge was however posed by changes in the definition of the census sector in the recent past. For the year 1997-98, 1998-99 and 1999-2000, the census sector was limited only to factories employing 200 or more workers. From 2000-01 onwards again the factories employing 100 or more workers are under the census sector. For consistency in the analysis, we exclude the years prior to 2000-01 from our analysis and focus on the period 2000-01 to 2005-06.

Another important challenge was to distinguish between entering and exiting firms categories of firms over the period of five years. Since our database comprises of relatively larger units (100 employees or more), entry of new plants is accounted for by not only newly established plants but also by those plants that were already existing in the sample sector but they have expanded and subsequently shifted to the census sector during the study period. These two categories of entering firms need to be differentiated because of the different dynamics that they might have undergone. While the former are young firms and have later-come advantages while the latter are successful factories which have undergone learning process through passive learning or active explorations. The two categories of plants are thus expected to have very different outcomes. Newly established firms are expected to have much smaller contribution than the winners. The exiting firm is defined as the firm that stopped functioning or downsized its operations during the study period. It might not have wound up operations due to the tight exit policy but it might have become sick and downsized their production activity to join the small sector. Last two categories of plants are switching-in and switching-out plants. These plants shifted to one industry to another industry during the reference period. In

all, we define 7 categories of plants. Their definition and notations are provided in Table 1.

Table 1: Status of Plant

Status	Notation	Definition
Continuing survivors	S	Present in both period 2005 and 2000 in the census sector
Entering survivors	ES	Present in 2005 in the census sector and 2000 in the small sector
New entrants	EN	Present in t in the census sector, absent in 2000
Entering plants	N	ES+EN
Exiting plants	X	Present in 2000 in the census sector, drop out in 2005
Switching-in plants	SI	Present in period 2005 in a reference industry, and present in 2000 in the other Industry
Switching-out plants	SO	Present in period 2000 in a reference industry, and present in 2005 in the other Industry

It required a careful examination of plants to identify different categories of productivity dynamics. Table 2 summaries definitions of the effects used in the study.

Table 2: Components of Productivity Decomposition

Effect	Category of plants	Clarification
Total entry effect	N= EN+ES	Effects of newly entering, expanding and switching-in firms
Total exit effect	X	Effects of exiting and downsizing firms
Net entry effect	N+ X	This is the effect of the process of creative destruction
With-in plant effect	S	This signifies the effects of S
Reallocation effect (Between plant effects + covariance)	S	It shows improvement in allocation efficiency by S
Switching effect	SI+SO	Effects of switching firms across industries

Table 3 presents the National Industrial Classification (NIC) at 2-digit level. This paper utilize this industrial categories in order to identify the switching-in and -out plants .

Table 3: National Industrial Classification (NIC) at 2-digit level

Code	Industy	Description
15	Food	Manufacture of food products and beverages
16	Tobacco	Manufacture of tobacco products
17	Textiles	Manufacture of textiles
18	Apparel	Manufacture of wearing apparel; dressing and dyeing of fur
19	Leather	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery,
20	Wood	Manufacture of wood and of products of wood and cork, except furniture;
21	Paper	Manufacture of paper and paper products
22	Publishing	Publishing, printing and reproduction of recorded media
23	Coke/Petoleum	Manufacture of coke, refined petroleum products and nuclear fuel
24	Chemicals	Manufacture of chemicals and chemical products
25	Rubber/Plastics	Manufacture of rubber and plastics products
26	Non-metallic Mineral	Manufacture of other non-metallic mineral products
27	Basic Metals	Manufacture of basic metals
28	Metal Products	Manufacture of fabricated metal products, except machinery and equipment
29	Machinery	Manufacture of machinery and equipment n.e.c.
30	Office Machinery	Manufacture of office, accounting and computing machinery
31	Electrical Machinery	Manufacture of electrical machinery and apparatus n.e.c.
32	Televison/Commuication	Manufacture of radio, television and communication equipment and apparatus
33	Mediacal/Watches	Manufacture of medical, precision and optical instruments, watches and clocks
34	Moter Vehicles	Manufacture of motor vehicles, trailers and semi-trailers
35	Other Transport	Manufacture of other transport equipment
36	Furniture	Manufacture of furniture; manufacturing n.e.c.

Source: Central Statistical Office, *National Industrial Classification 1998*.

The composition and number of plants are summarized in Table 4 for industries and Table 5 for the states. The total number of plants increased over this period. Overall, the number of plants in our dataset increased from 5713 in 2000 to 8163 in 2005. Of the total 5713 plants in 2000 and of the total 8163 plants in 2005, 2538 plants are continuing survivors (S). The rest are newly established plants (EN), entering survivors (ES), switching-in or switching-out plants (SI and SO). The number of switching plats is only 52. The entering survivors were originally small sized plants classified in the

sample sector or unorganized sector but have expanded and upgraded to qualify for the census sector. Given tight exit policy, the number of exiting plans (X) is more remarkable. It is 3123 and the share is 55%. Thus there have been significant business dynamics taking place in the manufacturing industry in rural areas.

Table 4: Plant Dynamics in Indian Manufacturing Industry across the Regions during 2000-2005

Code	Industry	year	Total	Surviving (S)	New Entering (EN)	Entering Survivor (ES)	Exiting (X)	Switching -in(SI)	Switching -out(SO)
15	Food	2000	1914	966			947		1
		2005	2071	966	379	726			
16	Tobacco	2000	97	16			81		
		2005	125	16	14	94		1	
17	Textiles	2000	882	438			439		5
		2005	1033	438	166	426		3	
18	Apparel	2000	59	15			43		1
		2005	123	15	54	54			
19	Leather	2000	75	30			45		
		2005	117	30	30	57			
20	Wood	2000	70	19			51		
		2005	114	19	24	71			
21	Paper	2000	131	53			75		3
		2005	212	53	55	102		2	
22	Publishing	2000	14	4			9		1
		2005	46	4	17	25			
23	Coke/Petoleum	2000	50	20			30		
		2005	113	20	36	54		3	
24	Chemicals	2000	615	285			323		7
		2005	854	285	178	380		11	
25	Rubber/Plastics	2000	191	69			115		7
		2005	260	69	59	129		3	
26	Non-metallic Mineral	2000	638	246			392		
		2005	1086	246	323	513		4	
27	Basic Metals	2000	274	99			174		1
		2005	558	99	229	224		6	
28	Metal Products	2000	96	38			54		4
		2005	227	38	80	108		1	
29	Machinery	2000	163	61			99		3
		2005	327	61	85	178		3	
30	Office Machinery	2000	10	3			6		1
		2005	20	3	9	8			
31	Electrical Machinery	2000	94	39			51		4
		2005	227	39	75	111		2	
32	Televison/Commuication	2000	53	23			30		
		2005	93	23	32	38			
33	Mediacal/Watches	2000	23	10			12		1
		2005	86	10	22	51		3	
34	Moter Vehicles	2000	119	59			56		4
		2005	237	59	48	126		4	
35	Other Transport	2000	92	29			62		1
		2005	113	29	22	60		2	
36	Furniture	2000	53	16			29		8
		2005	121	16	28	73		4	
-	All	2000	5713	2538	0	0	3123	0	52
		2005	8163	2538	1965	3608	0	52	0

Table 5: Plant dynamics in Indian Manufacturing Industry across the States during 2000-2005

State	year	Total	Surviving(S)	New Entering(EN)	Entering Survivor(ES)	Exiting(X)	Switching-in(SI)	Switching-out (SO)
Jammu & Kashmir	2000	16	8			7		1
	2005	93	8	18	66		1	
Himachal Pradesh	2000	39	22			15		2
	2005	214	22	117	73		2	
Punjab	2000	119	57			61		1
	2005	474	57	88	328		1	
Chandigarh(U.T.)	2000							
	2005	2		1	1			
Uttaranchal	2000	39	23			16		
	2005	209	23	95	91			
Haryana	2000	138	46			90		2
	2005	233	46	59	126		2	
Delhi	2000	1				1		
	2005	3			3			
Rajasthan	2000	121	48			73		
	2005	159	48	50	61			
Uttar Pradesh	2000	423	179			243		1
	2005	409	179	69	160		1	
Bihar	2000	80	18			62		
	2005	106	18	38	50			
Nagaland	2000	49	25			24		
	2005	43	25	7	11			
Manipur	2000	12	11			1		
	2005	27	11	8	8			
Tripura	2000	125	76			48		1
	2005	219	76	99	43		1	
Meghalaya	2000	18	13			2		3
	2005	51	13	20	15		3	
Assam	2000	317	202			115		
	2005	312	202	39	71			
West Bengal	2000	202	73			129		
	2005	246	73	63	110			
Jharkhand	2000	63	17			46		
	2005	116	17	54	45			
Orissa	2000	69	35			34		
	2005	156	35	53	68			
Chattisgarh	2000	66	19			47		
	2005	109	19	56	34			
Madhya Pradesh	2000	114	60			54		
	2005	137	60	17	60			
Gujarat	2000	535	166			361		8
	2005	560	166	141	245		8	
Daman & Diu	2000	78	32			43		3
	2005	210	32	72	103		3	
Dadra & Nagar Haveli	2000	91	30			60		1
	2005	205	30	78	96		1	
Maharashtra	2000	640	312			318		10
	2005	853	312	186	345		10	
Andhra Pradesh	2000	430	194			230		6
	2005	520	194	110	210		6	
Karnataka	2000	264	87			177		
	2005	308	87	98	123			
Goa	2000	59	31			28		
	2005	208	31	44	133			
Kerala	2000	302	114			187		1
	2005	437	114	116	206		1	
Tamil Nadu	2000	1223	607			609		7
	2005	1381	607	122	645		7	
Pondicherry	2000	68	30			33		5
	2005	159	30	46	78		5	
Andaman & N. Island	2000	12	3			9		
	2005	4	3	1				

3.3 Empirical Results

By following production function estimation method proposed by Levinsohn and Petrin (2003), we estimated the elasticity of production with respect to factor inputs in order to measure the total factor productivity (TFP). We use the unit-level ASI data which is unbalanced panel data for six years from 2000 to 2005. Due to necessity of sufficient observations for obtaining precise elasticity of factor inputs, the data covers not only rural but also urban census sectors. Fuel cost is set as proxy variable for unobserved productivity shock. Table 6 shows the estimation results.

Table 6: Industry-wise Estimation of Cobb-Douglas Production Function

Dependent variable: ln Gross Value Added																								
	15		16		17		18		19		20		21		22		23		24		25			
ln Labor	0.650	***	0.666	***	0.408	***	0.401	***	0.572	***	0.397	***	0.463	***	0.527	***	0.585	***	0.437	***	0.539	***		
	(0.011)		(0.020)		(0.018)		(0.016)		(0.031)		(0.057)		(0.036)		(0.041)		(0.095)		(0.018)		(0.033)			
ln Capital	0.256	***	0.084	**	0.392	***	0.337	***	0.345	***	0.235	**	0.535	***	0.165	*	0.636	***	0.321	***	0.481	***		
	(0.026)		(0.036)		(0.041)		(0.027)		(0.064)		(0.120)		(0.077)		(0.091)		(0.057)		(0.053)		(0.094)			
Number of observations	13525		1807		10301		4423		1662		766		1373		1348		266		7391		2233			
Number of groups	4970		809		3693		2138		716		447		620		682		159		2706		975			
Wald Test of CRS χ^2	11.00	***	37.28	***	19.91	***	76.44	***	1.54		8.98	***	0.00		9.65	***	11.14	***	19.24	***	0.04			
	26		27		28		29		30		31		32		33		34		35		36			
ln Labor	0.528	***	0.591	***	0.584	***	0.708	***	0.216	*	0.641	***	0.621	***	0.564	***	0.611	***	0.520	***	0.565	***		
	(0.022)		(0.030)		(0.029)		(0.031)		(0.128)		(0.043)		(0.069)		(0.077)		(0.040)		(0.045)		(0.033)			
ln Capital	0.270	***	0.273	**	0.201		0.315	***	0.510	**	0.405	***	0.736	***	0.732	***	0.517	***	0.516	***	0.303	***		
	(0.044)		(0.108)		(0.140)		(0.060)		(0.207)		(0.094)		(0.135)		(0.177)		(0.080)		(0.098)		(0.075)			
Number of observations	5629		3456		2613		3936		221		2253		1044		893		2422		1525		1938			
Number of groups	2352		1697		1195		1830		123		1027		487		462		966		649		1017			
Wald Test of CRS χ^2	16.37	***	1.70		2.42		0.15		1.55		0.23		6.16	**	2.29		2.58		0.14		2.53			

Note: All except column 20, 23, and 30 are estimated by Levinshon-Petrin (2003) using the fuel as proxy variable of unobservable shock and initial value of fixed capital as Capital.
Column 23 is estimated by GLS based on random effect model.
Column 20, and 30 are estimated by Levinshon-Petrin (2003) using the material as proxy variable of unobservable shock and ending value of fixed capital as Capital.
***: 1%, **: 5%, *: 10% significant level.

According to the estimation results, the parameters of capital and labor (α and β),could be obtained by Levinsohn-Petrin method with the exception of one industry. Only in Coke/Petroleum, the parameters was got by the random-effects model because Levinsohn-Petrin method could not get statistically significant estimation. The estimated coefficient is significant at the 10% level in almost all cases (Case of Metal Products is exception. However, its p value is 15%). Therefore, it is regarded that the estimation results is generally satisfied. Thus, for α and β, we utilize the estimation shown in Table 6 in order to measure the TFP.

Figures 7 and 8 shows the estimated trend of both labor productivity (LP) and TFP in entire manufacturing sector during the period from 2000 to 2005 with the results of the static Olley-Pakes decomposition (Olley and Pakes 1996). From the figures, two findings can be pointed out. First, it can be seen that both LP and TFP greatly improved from 2000 to 2005. Second, covariance between individual productivity and market share dominated the trend of the aggregate productivity. Third, the movement of LP and TFP shows the same trajectory with some difference. That is, while the LP was stagnation from 2000 to 2003 and then risen sharply since 2003, the TFP increased from 2000 to 2003, fallen from 2003 to 2004, and then soared again in 2005.

Figure 7: Aggregate Labor Productivity (LP) and Static Olley-Pakes Decomposition

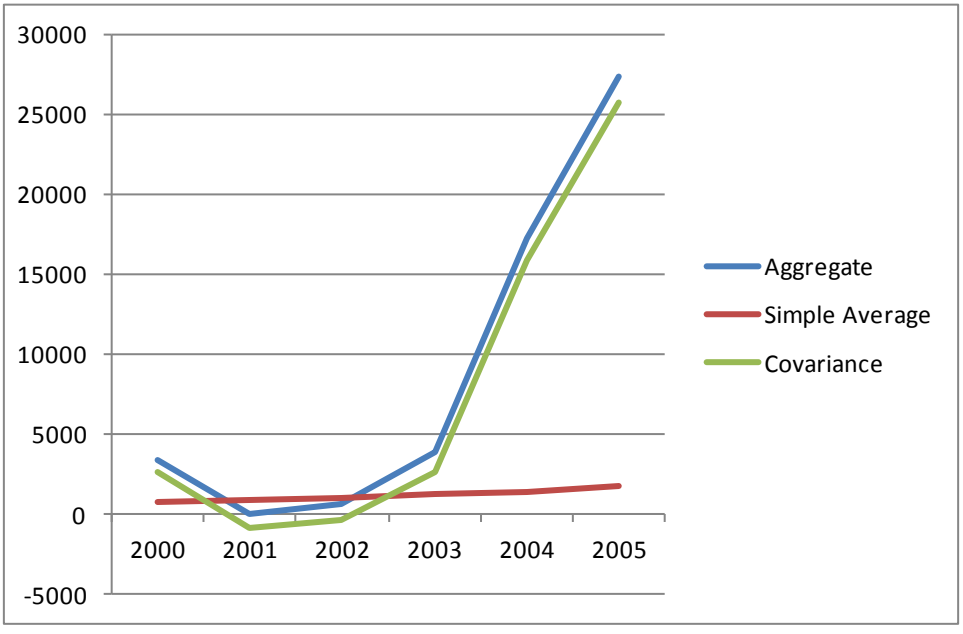


Figure 8: Aggregate Total Factor Productivity (TFP) and Static Olley=Pakes Decomposition

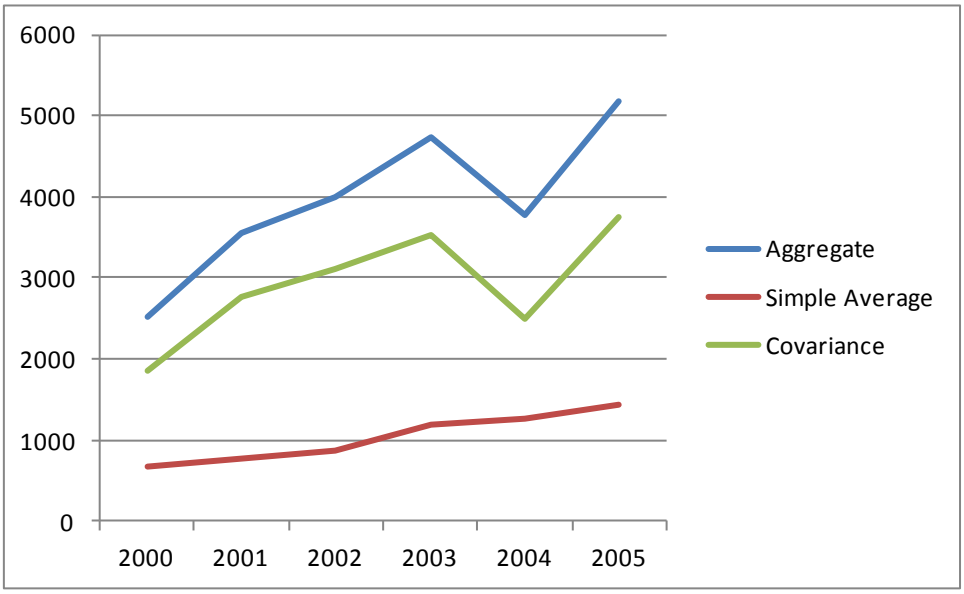


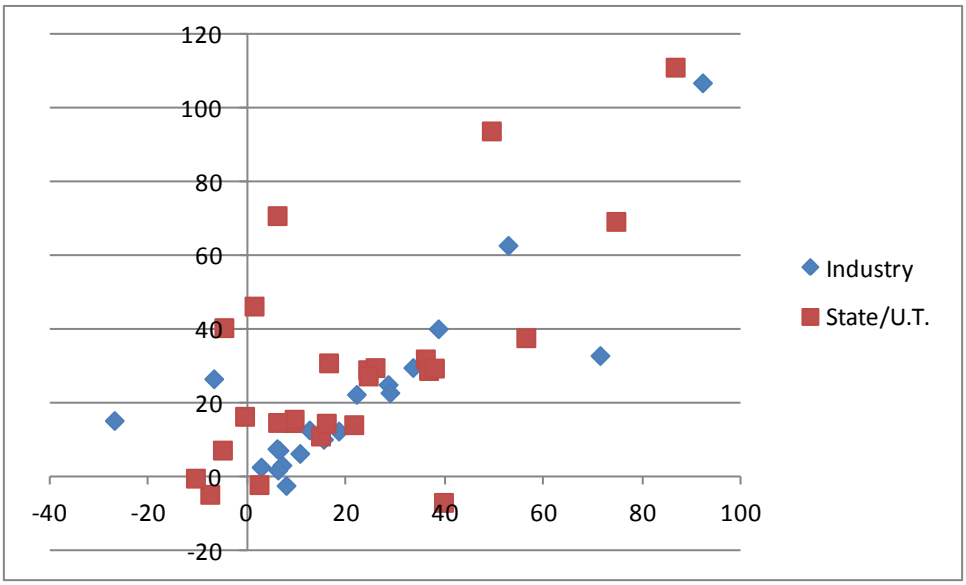
Table 5 presents the decomposition results for Indian manufacturing based on FHK, GR and DOP methodologies. As the decomposition results are sensitive to the choice of methodology, the present study regards the results which three methodologies of GR, FHK and DOP show same sign as robust. Otherwise, the results are not accepted in this study. According to the robust results in the case of LP, within effect, reallocation effect and exit effect are robustly positive. In addition, in the case of TFP, while within effect, total entry effect, and exit effect are robustly positive, switching effect is robust negative. Therefore, within effect generated by the continuing survivors contributed to the improvement of both productivities. Entry and exit effects also had robust positive impact on the productivity.

Table 7: Decomposition of Growth of Labor Productivity (LP) and Total Factor Productivity (TFP) over 2000-1 to 2005-06

			(1)	(2)	(3)	(6)	(7)	(8)	(11)	(12)
Productity	Growth rate	Method	Within effect	Reallocation effect	Total CS effect	Total entry effect	Exit effect	Net entry effect	Switching effect	Total
					(1)+(2)	(4)+(5)		(6)+(7)	(9)+(10)	(3)+(8)+(11)
LP	52.3	FHK	43.5	21.6	65.1	15.5	6.7	22.2	12.7	100.0
		GR	52.6	19.1	71.8	−2.2	23.2	21.0	7.3	100.0
		DOP	3.3	125.7	129.1	−33.4	9.6	−23.8	−5.3	100.0
		Robust sign	+	+	+		+			
		Range	[3,53]	[19, 126]	[65,129]		[7, 23]			
TFP	15.5	FHK	77.8	−31.9	46.0	58.0	11.3	69.3	−15.3	100.0
		GR	69.0	−16.5	52.4	40.3	28.0	68.3	−20.8	100.0
		DOP	20.4	72.4	92.8	20.6	15.7	36.3	−29.0	100.0
		Robust sign	+		+	+	+	+	−	
		Range	[20,78]		[46,93]	[21,59]	[11,28]	[36,69]	[−29,−15]	

Assuming a Cobb-Douglas production function, LP can be decomposed into the TFP and the capital-labor ratio. Therefore, it is useful to see the relationship between the growth rates of TFP and LP. Figure 9 shows scattered plots on the growth rates of TFP and LP across both industries and states. According to the figure, there is positive relationship between both productivity growth. In this sense, it can be suggested that the growth of TFP has significant role in enhancing the LP.

Figure 9: Growth of Labor Productivity (LP) as Vertical Axis and Growth of Total Factor Productivity (TFP) as Horizontal Axis



Tables A-1 to A-4 show the result of industry-wise and state-wise decomposition. As these tables are too large, it would be very complicated that each result is discussed sequentially. Therefore, we summarized the results as two points. First, regardless of the type of productivity, industry and state, productivity growth is positive in many cases. But, there are several negative growth: Furniture, Andaman, Daman, Delhi, Jharkhand, Madhya Pradesh, Manipur in case of LP and Motor Vehicles, Paper, Andaman, Bihar, Daman, Manipur, Orissa, and West Bengal in case of TFP. In addition, it is noted that employing the double deflation method for calculation of real value added sometime induces negative productivity: Coal/Petroleum in 2000, Karnataka and Kerala in 2000, Jharkhand in 2005 in case of LP, and Andaman in 2005 in case of TFP. Many of States/UTs which have negative value of productivity are basically North East states, or UTs. These have only small samples and may face unaccountable fluctuations.

Second, Table 8 summarizes the robust results drawing from Tables A-1 to A-4.

According to the table, the number of the robustly positive value in within effect is largest: 18 in industry-wise LP, 19 in industry wise TFP, 24 in state-wise LP, and 24 in state-wise TFP. The next is total entry effect and the third is exit effect. These results also confirm the results of the entire manufacturing sectors as shown in Table 7.

Table 8: Summary Results on Decomposition of Growth of Labor Productivity (LP) and Total Factor Productivity (TFP) over 2000-1 to 2005-06

	(1)	(2)	(3)	(6)	(7)	(8)	(11)
	Within effect	Reallocation effect	Total CS effect	Total entry effect	Exit effect	Net entry effect	Switching effect
			(1)+(2)			(6)+(7)	
Industy-wise LP	18	5	19	14	13	17	6
Industy-wise TFP	19	8	19	14	10	14	6
State/UT-wise LP	24	8	20	14	16	17	5
State/UT-wise TFP	24	5	23	16	14	15	5

4. Concluding Remarks

The India's organized manufacturing sector in rural area has seen steady growth since the end of 1990s. This paper investigates the impact of firms' dynamics on the aggregate productivity growth of the organized manufacturing sector in rural area across states and industries during the period from 2000-01 to 2005-06. The empirical analysis in this paper is based on decomposition techniques of aggregate productivity growth (Baily, Hulten and Campbell 1992, Griliches and Regev 1995, Foster, Haltiwanger, and Krizan 2001, Balwin and Gu 2003, Olley and Pakes 1996, and Melitz and Polanec 2009). Results show both labor productivity and total factor productivity of the organized manufacturing sectors in rural area increased during the reference period, and the aggregate productivity growth is supported by the productivity growth of the continuing firms, the entry of productive firms, and the exit of less productive firms. It can be concluded that the firms' productivity dynamics contributed the current rural industrialization in India.

This study examined both state-wise and industry-wise characteristics of the productivity dynamics in the rural manufacturing industries. As one of the future research agendas, state-industry wise analysis can be done in order to deeply understand the nature of current rural industrialization. In addition, it is note that in this paper there

is a risk of underestimation of the entry effect on productivity growth because the decompositions fail to account for indirect effects of entry on the productivity of continuing firms. The measured within and reallocation effects could in part be due to the threat of new entry of more competitive outsiders. But this indirect effect of entry is not captured in these methodologies. The indirect effects can be explored in the second stage of this research. Finally, it can be guessed that India's government policy played a important role to some extent in stimulating the current rural industrialization. Empirical studies about the impact of the policy on the rural Industries will be fruitful research agenda.

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Table A-1: Decomposition of Labor Productivity Growth across Industries

				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Industry	Growth rate	Method	Within effect	Reallocation effect	Total CS effect (1)+(2)	EN	ES	Total entry effect (4)+(5)	Exit effect	Net entry effect (6)+(7)	SI	SO	Switching effect (9)+(10)	Total (3)+(8)+(11)
15	Food	2.6	FHK	8.8	19.0	27.8	13.7	63.2	76.9	−5.1	71.8	0.0	0.4	0.4	100.0
			GR	34.7	2.0	36.7	7.7	46.0	53.7	9.2	62.9	0.0	0.5	0.5	100.0
			DOP	58.6	−8.9	49.7	8.5	48.4	56.9	−7.0	49.9	0.0	0.4	0.4	100.0
			Robust sign	+		+	+	+	+		+		+	+	
			Range	[9,59]		[28,50]	[8,14]	[46,63]	[54,77]		[50,72]		(0,1]	(0,1]	
16	Tobacco	7.1	FHK	−28.2	28.1	−0.1	18.2	99.3	117.5	−13.2	104.3	−4.2	0.0	−4.2	100.0
			GR	−13.8	20.5	6.8	9.9	61.9	71.9	26.8	98.7	−5.4	0.0	−5.4	100.0
			DOP	−10.7	−133.8	−144.5	53.0	256.6	309.6	−65.8	243.8	0.7	0.0	0.7	100.0
			Robust sign	−			+	+	+		+				
			Range	[−28,−10]			[10,53]	[62,257]	[72,307]		[99,244]				
17	Textiles	6.3	FHK	−6.3	33.3	26.9	5.5	73.8	79.4	−13.0	66.4	6.4	0.3	6.6	100.0
			GR	3.2	27.7	30.9	0.8	58.4	59.3	3.6	62.9	5.8	0.4	6.2	100.0
			DOP	42.2	1.1	43.3	3.3	66.4	69.6	−19.3	50.3	6.1	0.2	6.3	100.0
			Robust sign		+	+	+	+	+		+	+	+	+	
			Range		[1,33]	[27,43]	[0.8,6]	[58,74]	[59,79]		[50,66]	[6,7)	[0.2,0.4]	[6,7]	
18	Apparel	10.1	FHK	63.5	−49.7	13.8	16.3	91.5	107.8	−21.9	86.0	0.0	0.2	0.2	100.0
			GR	40.9	−22.5	18.4	3.1	65.4	68.4	12.9	81.3	0.0	0.3	0.3	100.0
			DOP	123.7	−89.0	34.6	26.1	110.7	136.8	−71.5	65.3	0.0	0.1	0.1	100.0
			Robust sign	+	−	+	+	+	+		+		+	+	
			Range	[41,124]	[−89,−23]	[14,35]	[3,26]	[65,111]	[68,137]		[65,86]		(0,1)	(0,1)	
19	Leather	15.3	FHK	2.7	2.9	5.6	81.9	2.9	84.8	9.6	94.4	0.0	0.0	0.0	100.0
			GR	15.7	−6.9	8.8	73.2	−20.4	52.8	38.4	91.2	0.0	0.0	0.0	100.0
			DOP	34.1	−14.6	19.6	74.5	−16.8	57.8	22.7	80.4	0.0	0.0	0.0	100.0
			Robust sign	+		+	+		+	+	+				
			Range	[3,34]		[6,20]	[73,82]		[53,85]	[10,38]	[80,94]				
20	Wood	25.0	FHK	24.1	−14.0	10.1	0.0	87.7	87.7	2.2	89.9	0.0	0.0	0.0	100.0
			GR	17.2	9.7	26.9	−1.9	50.7	48.8	24.2	73.1	0.0	0.0	0.0	100.0
			DOP	38.3	13.1	51.4	−2.1	46.8	44.6	3.9	48.6	0.0	0.0	0.0	100.0
			Robust sign	+		+		+	+	+	+				
			Range	[17,38]		[10,51]		[57,88]	[45,88]	[2,24]	[49,90]				
21	Paper	15.2	FHK	53.5	−4.1	49.4	4.3	32.4	36.6	13.9	50.5	0.1	0.0	0.1	100.0
			GR	54.4	−2.6	51.8	2.5	13.3	15.8	32.6	48.4	−0.2	0.0	−0.2	100.0
			DOP	76.9	10.6	87.5	0.4	−9.6	−9.2	22.2	13.1	−0.6	0.0	−0.6	100.0
			Robust sign	+		+	+			+	+				
			Range	[54,77]		[49,88]	[0.4,4]			[14,32]	[13,51]				
22	Publishing	7.6	FHK	−39.9	22.8	−17.1	−15.4	130.3	114.9	−6.9	108.0	0.0	9.1	9.1	100.0
			GR	−28.0	18.6	−9.4	−19.3	90.1	70.8	27.3	98.1	0.0	11.3	11.3	100.0
			DOP	−114.9	−17.6	−132.5	−5.9	230.2	224.3	−1.3	223.0	0.0	9.5	9.5	100.0
			Robust sign	−		−	−	+	+		+		+	+	
			Range	[−115,−28]		[−133,−9]	[−19,−6]	[90,230]	[71,224]		[98,223]		[9,11]	[9,11]	
23	Coke/Petoleum	*	FHK	73.1	−5.9	67.2	0.0	0.5	0.5	11.3	11.9	20.9	0.0	20.9	100.0
			GR	69.6	5.7	75.3	−0.3	−1.7	−2.0	36.1	34.1	−9.4	0.0	−9.4	100.0
			DOP	19.1	187.1	206.2	−1.3	−9.6	−10.9	22.4	11.5	−117.7	0.0	−117.7	100.0
			Robust sign	+		+				+	+				
			Range	[19,73]		[67,206]				[11,22]	[12,34]				
24	Chemicals	12.3	FHK	83.9	−3.9	79.9	14.0	0.2	14.2	17.3	31.5	−0.2	−11.3	−11.4	100.0
			GR	85.5	−4.0	81.6	10.1	−13.4	−3.4	29.0	25.7	−0.3	−7.0	−7.2	100.0
			DOP	20.2	104.0	124.2	3.5	−36.0	−32.6	19.4	−13.2	−0.5	−10.5	−11.0	100.0
			Robust sign	+		+	+			+		−	−	−	
			Range	[20,86]		[80,124]	[4,14]			[17,29]		(−1,0)	[−11,−7]	[−11,−7]	
25	Rubber/Plastics	3.1	FHK	143.4	9.2	152.7	11.2	−25.1	−13.9	−40.8	−54.7	−1.3	3.4	2.1	100.0
			GR	159.3	−6.9	152.4	8.4	−37.6	−29.3	−26.0	−55.3	−1.4	4.3	2.9	100.0
			DOP	70.7	150.7	221.4	1.8	−66.8	−65.1	−57.0	−122.0	−1.7	2.3	0.6	100.0
			Robust sign	+		+	+	−	−	−	−	−	+	+	
			Range	[71,159]		[152,221]	[2,11]	[−67,−25]	[−65,−14]	[−57,−26]	[−122,−55]	[−2,−1]	[2,4]	[0.6,3]	

				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Industry	Growth rate	Method	Within effect	Reallocation effect	Total CS effect (1)+(2)	EN	ES	Total entry effect (4)+(5)	Exit effect	Net entry effect (6)+(7)	SI	SO	Switching effect (9)+(10)	Total (3)+(8)+(11)
26	Non-metallic Mineral	12.7	FHK	58.8	10.5	69.3	0.8	16.8	17.5	13.2	30.7	0.0	0.0	0.0	100.0
			GR	68.6	3.4	72.1	−3.8	7.6	3.7	24.3	28.0	−0.1	0.0	−0.1	100.0
			DOP	25.1	72.3	97.4	−9.7	−4.3	−14.0	16.9	2.9	−0.3	0.0	−0.3	100.0
			Robust sign	+	+	+				+	+				
			Range	[25,69]	[3,72]	[69,97]				[13,24]	[3,30]				
27	Basic Metals	1.7	FHK	504.6	157.9	662.5	−102.3	−324.3	−426.6	−114.3	−541.0	−22.5	0.9	−21.6	100.0
			GR	545.5	119.9	665.5	−109.5	−344.5	−454.1	−88.6	−542.6	−23.7	0.9	−22.8	100.0
			DOP	137.3	1388.3	1525.6	−288.0	−847.0	−1135.1	−235.4	−1370.4	−55.8	0.7	−55.1	100.0
			Robust sign	+	+	+	−	−	−	−	−	−	+	−	
			Range	[137,546]	[120,1388]	[663,1526]	[−288,−102]	[−847,−324]	[−1135,−427]	[−235,−89]	[−1370,−541]	[−56,−23]	(0,1]	[−55,−22]	
28	Metal Products	40.1	FHK	27.4	−3.2	24.2	26.8	53.4	80.3	−1.8	78.5	0.1	−2.8	−2.7	100.0
			GR	26.7	4.3	31.0	15.7	29.6	45.3	15.2	60.5	−0.2	8.8	8.5	100.0
			DOP	39.7	37.9	77.7	11.9	21.5	33.4	−5.4	27.9	−0.4	−5.2	−5.6	100.0
			Robust sign	+		+	+	+	+		+				
			Range	[27,40]		[24,78]	[12,27]	[22,53]	[33,80]		[28,79]				
29	Machinery	22.3	FHK	48.8	−13.7	35.1	12.7	39.1	51.8	1.6	53.4	11.2	0.3	11.5	100.0
			GR	44.1	−2.6	41.5	6.8	20.1	26.8	22.1	49.0	9.0	0.6	9.6	100.0
			DOP	30.9	47.1	77.9	3.0	8.2	11.3	3.0	14.2	7.6	0.3	7.8	100.0
			Robust sign	+		+	+	+	+	+	+	+	+	+	
			Range	[31,49]		[35,78]	[3,13]	[8,39]	[11,52]	[2,22]	[14,53]	[8,11]	(0,1)	[8,12]	
30	Office Machinery	107.0	FHK	5.6	−4.6	1.0	0.1	98.7	98.9	0.1	99.0	0.0	0.0	0.0	100.0
			GR	3.4	21.2	24.6	−2.6	57.5	54.9	19.9	74.8	0.0	0.6	0.6	100.0
			DOP	5.1	4.0	9.1	−0.4	91.1	90.7	0.2	90.9	0.0	0.0	0.0	100.0
			Robust sign	+		+		+	+	+	+				
			Range	[3,6]		[1,25]		[58,99]	[55,99]	(0,20]	[75,99]				
31	Electrical Machinery	29.6	FHK	28.2	−5.7	22.5	11.7	78.6	90.2	−12.7	77.6	−0.5	0.4	0.0	100.0
			GR	20.6	14.9	35.5	4.5	48.6	53.1	11.7	64.8	−1.6	1.2	−0.3	100.0
			DOP	35.1	33.1	68.2	5.5	52.4	57.9	−24.7	33.2	−1.4	0.0	−1.4	100.0
			Robust sign	+		+	+	+	+		+	−			
			Range	[21,35]		[23,68]	[5,12]	[49,79]	[53,90]		[33,78]	[−2,−1]			
32	Televison/Commuication	32.9	FHK	71.4	−25.0	46.4	32.8	17.8	50.7	2.9	53.6	0.0	0.0	0.0	100.0
			GR	60.2	−1.4	58.8	21.8	10.1	31.9	9.4	41.2	0.0	0.0	0.0	100.0
			DOP	23.3	52.4	75.7	15.4	5.5	20.9	3.3	24.3	0.0	0.0	0.0	100.0
			Robust sign	+		+	+	+	+	+	+				
			Range	[23,71]		[46,76]	[15,33]	[6,18]	[21,51]	[3,9]	[24,54]				
33	Mediacal/Watches	22.8	FHK	34.4	34.4	68.8	15.2	1.3	16.5	14.7	31.2	−0.5	0.5	−0.1	100.0
			GR	48.5	17.2	65.7	9.3	−21.8	−12.6	47.1	34.6	−1.2	0.9	−0.3	100.0
			DOP	32.0	130.9	162.9	−9.3	−94.6	−103.9	43.4	−60.5	−3.3	0.9	−2.4	100.0
			Robust sign	+	+	+				+		−	+	−	
			Range	[32,49]	[17,131]	[66,163]				[15,47]		[−3,−1]	[0.5,1]	[−2,0)	
34	Moter Vehicles	26.6	FHK	62.5	−7.0	55.5	0.4	39.2	39.6	4.8	44.4	−0.1	0.2	0.1	100.0
			GR	59.3	3.8	63.1	−1.7	23.7	22.0	14.7	36.7	−0.4	0.5	0.2	100.0
			DOP	35.9	51.9	87.8	−3.5	10.0	6.5	6.0	12.6	−0.6	0.2	−0.4	100.0
			Robust sign	+		+		+	+	+	+	−	+		
			Range	[36,63]		[56,88]		[10,39]	[7,40]	[5,15]	[13,44]	(−1,0)	(0,1)		
35	Other Transport	62.8	FHK	54.9	42.4	97.3	0.2	1.1	1.3	1.0	2.3	0.4	0.0	0.4	100.0
			GR	77.0	18.4	95.4	−1.3	−4.1	−5.3	10.3	5.0	−0.6	0.2	−0.4	100.0
			DOP	35.5	79.0	114.5	−3.2	−10.8	−14.0	1.3	−12.7	−1.8	0.0	−1.8	100.0
			Robust sign	+	+	+				+					
			Range	[36,77]	[18,79]	[95,115]				[1,10]					
36	Furniture	−2.4	FHK	−190.3	−180.1	−370.4	33.3	202.4	235.7	265.9	501.6	13.2	−44.3	−31.1	100.0
			GR	−338.7	−40.6	−379.4	28.7	183.0	211.7	297.7	509.4	11.5	−41.6	−30.1	100.0
			DOP	−140.1	−882.6	−1022.8	61.3	321.0	382.3	723.1	1105.3	23.2	−5.8	17.4	100.0
			Robust sign	−	−	−	+	+	+	+	+	+	−		
			Range	[−339,−140]	[−883,−41]	[1023,−370]	[29,61]	[183,321]	[212,382]	[266,723]	[502,1105]	[12,23]	[−44,−6]		

Table A-2: Decomposition of Total Factor Productivity Growth across Industries

				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Industry	Growth rate	Method	Within effect	Reallocation effect	Total CS effect (1)+(2)	EN	ES	Total entry effect (4)+(5)	Exit effect	Net entry effect (6)+(7)	SI	SO	Switching effect (9)+(10)	Total (3)+(8)+(11)
15	Food	2.7	FHK	17.4	35.0	52.4	−7.5	80.3	72.8	−25.6	47.2	0.0	0.4	0.4	100.0
			GR	45.4	15.2	60.6	−13.4	62.9	49.5	−10.6	38.9	0.0	0.4	0.4	100.0
			DOP	73.1	13.8	86.9	−13.5	62.5	49.0	−36.3	12.7	0.0	0.4	0.4	100.0
			Robust sign	+	+	+	−	+	+	−	+		+	+	
			Range	[17,73]	[14,35]	[52,87]	[−14,−8]	[63,80]	[49,73]	[−36,−11]	[13,47]		(0,1)	(0,1)	
16	Tobacco	6.4	FHK	−38.6	34.0	−4.6	8.4	109.8	118.1	−9.1	109.0	−4.4	0.0	−4.4	100.0
			GR	−18.9	21.2	2.3	0.5	72.0	72.5	30.8	103.3	−5.6	0.0	−5.6	100.0
			DOP	−16.3	−152.7	−169.1	41.8	271.5	313.4	−45.0	268.4	0.7	0.0	0.7	100.0
			Robust sign	−			+	+	+		+				
			Range	[−39,−16]			[1,42]	[72,272]	[73,313]		[103,268]				
17	Textiles	10.6	FHK	24.6	12.2	36.9	11.1	57.0	68.1	−7.1	61.0	2.0	0.2	2.2	100.0
			GR	32.0	9.0	41.0	6.5	41.5	48.0	9.3	57.2	1.4	0.4	1.8	100.0
			DOP	48.6	12.9	61.5	6.4	41.1	47.5	−10.5	37.0	1.4	0.2	1.6	100.0
			Robust sign	+	+	+	+	+	+		+	+	+	+	
			Range	[25,49]	[9,13]	[37,62]	[6,11]	[41,57]	[48,68]		[37,61]	[1,2]	(0,1)	[2,3)	
18	Apparel	15.4	FHK	18.6	−1.1	17.5	4.9	87.8	92.8	−10.3	82.5	0.0	0.1	0.1	100.0
			GR	19.5	4.8	24.4	−8.6	62.4	53.8	21.7	75.5	0.0	0.2	0.2	100.0
			DOP	47.0	14.3	61.3	−4.0	71.1	67.2	−28.5	38.7	0.0	0.0	0.0	100.0
			Robust sign	+		+		+	+		+				
			Range	[19,47]		[18,61]		[62,88]	[54,93]		[39,83]				
19	Leather	8.0	FHK	0.5	9.5	10.0	84.2	−8.2	76.0	14.0	90.0	0.0	0.0	0.0	100.0
			GR	26.2	−13.1	13.1	75.8	−31.7	44.1	42.8	86.9	0.0	0.0	0.0	100.0
			DOP	46.6	−13.4	33.3	73.1	−39.4	33.7	33.1	66.7	0.0	0.0	0.0	100.0
			Robust sign	+		+	+	−	+	+	+				
			Range	[0.5,47]		[10,33]	[73,84]	[−39,−8]	[34,76]	[14,43]	[67,90]				
20	Wood	28.5	FHK	28.4	−17.4	11.0	−0.3	84.7	84.4	4.6	89.0	0.0	0.0	0.0	100.0
			GR	20.9	7.2	28.1	−2.2	47.7	45.5	26.4	71.9	0.0	0.0	0.0	100.0
			DOP	32.9	29.1	62.0	−3.0	32.8	29.8	8.2	38.0	0.0	0.0	0.0	100.0
			Robust sign	+		+	−	+	+	+	+				
			Range	[21,33]		[11,62]	[−3,0)	[33,85]	[30,84]	[5,26]	[38,89]				
21	Paper	−27.0	FHK	−8.9	−5.5	−14.3	3.5	37.9	41.4	72.4	113.8	0.6	0.0	0.6	100.0
			GR	−8.9	−3.0	−11.9	1.7	18.8	20.5	91.2	111.7	0.3	0.0	0.2	100.0
			DOP	−15.5	0.4	−15.2	−0.1	−0.6	−0.7	115.9	115.2	−0.1	0.0	−0.1	100.0
			Robust sign	−		−				+	+				
			Range	[−16,−9]		[−15,−12]				[72,116]	[112,115]				
22	Publishing	5.9	FHK	−57.3	25.4	−32.0	−19.0	132.7	113.8	6.8	120.5	0.0	11.5	11.5	100.0
			GR	−39.4	15.1	−24.3	−22.6	92.3	69.7	41.0	110.7	0.0	13.6	13.6	100.0
			DOP	−245.7	64.2	−181.5	−10.7	225.4	214.7	52.5	267.2	0.0	14.3	14.3	100.0
			Robust sign	−	+	−	−	+	+	+	+		+	+	
			Range	[−246,−39]	[15,64]	[−182,−24]	[−23,−11]	[92,225]	[70,215]	[7,53]	[111,267]		[12,14]	[12,14]	
23	Coke/Petoleum	66.1	FHK	91.3	−5.7	85.6	0.1	0.5	0.5	12.1	12.6	1.8	0.0	1.8	100.0
			GR	87.1	6.6	93.7	−0.2	−1.7	−1.9	36.8	34.9	−28.6	0.0	−28.6	100.0
			DOP	18.5	241.7	260.2	−1.3	−12.1	−13.4	23.9	10.5	−170.7	0.0	−170.7	100.0
			Robust sign	+		+				+	+				
			Range	[19,91]		[86,260]				[12,37]	[11,35]				
24	Chemicals	18.4	FHK	79.1	−5.1	73.9	13.2	3.7	16.9	8.6	25.5	−0.1	0.8	0.6	100.0
			GR	79.7	−4.5	75.1	9.2	−10.0	−0.7	20.8	20.0	−0.2	5.1	4.8	100.0
			DOP	19.5	95.6	115.1	3.0	−31.6	−28.6	12.0	−16.6	−0.4	2.0	1.5	100.0
			Robust sign	+		+	+			+		−	+	+	
			Range	[20,80]		[74,115]	[3,13]			[9,21]		[−0.4,−0.1]	[1,5]	[1,5]	
25	Rubber/Plastics	7.0	FHK	79.7	3.9	83.6	12.1	22.6	34.7	−18.4	16.3	−0.3	0.3	0.0	100.0
			GR	85.5	−2.3	83.3	9.5	10.1	19.5	−3.6	15.9	−0.4	1.2	0.8	100.0
			DOP	68.7	52.1	120.8	7.1	−1.1	6.0	−26.2	−20.1	−0.5	−0.2	−0.7	100.0
			Robust sign	+		+	+		+	−		−			
			Range	[69,86]		[83,121]	[7,12]		[6,35]	[−26,−4]		[−1,0)			

				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Industry	Growth rate	Method	Within effect	Reallocation effect	Total CS effect (1)+(2)	EN	ES	Total entry effect (4)+(5)	Exit effect	Net entry effect (6)+(7)	SI	SO	Switching effect (9)+(10)	Total (3)+(8)+(11)
26	Non-metallic Mineral	12.5	FHK	64.0	9.0	73.0	1.4	15.4	16.8	10.1	26.9	0.1	0.0	0.1	100.0
			GR	72.5	3.2	75.8	−3.1	6.1	3.0	21.2	24.2	0.0	0.0	0.0	100.0
			DOP	34.3	67.9	102.2	−8.9	−6.0	−15.0	13.0	−2.0	−0.2	0.0	−0.2	100.0
			Robust sign	+	+	+				+					
			Range	[34,73]	[3,68]	[73,102]				[10,21]					
27	Basic Metals	6.1	FHK	150.8	42.9	193.7	−16.4	−70.2	−86.6	−3.0	−89.6	−4.3	0.2	−4.1	100.0
			GR	162.5	34.1	196.6	−23.6	−90.5	−114.0	22.8	−91.3	−5.5	0.2	−5.3	100.0
			DOP	62.5	391.6	454.1	−80.6	−251.8	−332.5	−5.9	−338.4	−15.8	0.2	−15.7	100.0
			Robust sign	+	+	+	−	−	−		−	−	+	−	
			Range	[63,163]	[34,392]	[194,454]	[−81,−16]	[−252,−70]	[−333,−87]		[−338,−90]	[−16,−4]	[0.2,0.2]	[−16,−4]	
28	Metal Products	38.6	FHK	28.4	−1.2	27.2	22.6	53.7	76.3	−2.4	73.9	0.2	−1.3	−1.1	100.0
			GR	28.7	5.0	33.7	12.3	29.4	41.6	14.7	56.3	−0.2	10.2	10.0	100.0
			DOP	44.3	42.9	87.2	6.3	15.4	21.7	−5.3	16.5	−0.4	−3.3	−3.7	100.0
			Robust sign	+		+	+	+	+		+				
			Range	[28,44]		[27,87]	[6,23]	[15,54]	[22,76]		[17,74]				
29	Machinery	22.0	FHK	37.9	−5.2	32.7	22.5	39.5	62.0	−3.0	59.0	8.0	0.3	8.3	100.0
			GR	35.8	3.0	38.8	16.5	20.4	36.9	18.0	54.9	5.7	0.6	6.3	100.0
			DOP	36.6	34.3	70.9	14.6	14.2	28.8	−4.9	23.9	5.0	0.2	5.2	100.0
			Robust sign	+		+	+	+	+		+	+	+	+	
			Range	[36,38]		[33,71]	[15,23]	[14,40]	[29,62]		[24,59]	[5,8]	[0.2,0.6]	[5,8]	
30	Office Machinery	92.2	FHK	7.4	−6.5	1.0	0.0	98.4	98.4	0.6	99.0	0.0	0.0	0.0	100.0
			GR	4.5	20.9	25.3	−0.4	55.2	54.7	19.3	74.0	0.0	0.7	0.7	100.0
			DOP	7.0	4.6	11.6	−0.1	87.5	87.4	1.0	88.4	0.0	0.1	0.1	100.0
			Robust sign	+		+		+	+	+	+				
			Range	[5,7]		[1,25]		[55,98]	[55,98]	[1,19]	[74,99]				
31	Electrical Machinery	33.5	FHK	17.9	−1.3	16.6	12.3	79.1	91.4	−8.1	83.3	−0.1	0.3	0.2	100.0
			GR	14.5	14.9	29.4	6.0	48.5	54.5	16.2	70.7	−1.2	1.1	−0.1	100.0
			DOP	37.2	14.9	52.2	7.7	56.9	64.6	−15.8	48.8	−0.9	0.0	−0.9	100.0
			Robust sign	+		+	+	+	+		+	−			
			Range	[15,37]		[17,52]	[6,12]	[49,79]	[55,91]		[49,83]	[−1,−0.1]			
32	Televison/Commuication	71.4	FHK	12.1	−2.6	9.4	67.7	23.6	91.3	−0.7	90.6	0.0	0.0	0.0	100.0
			GR	10.9	10.7	21.6	56.9	15.8	72.7	5.7	78.4	0.0	0.0	0.0	100.0
			DOP	18.2	−3.5	14.7	64.7	21.4	86.2	−0.9	85.3	0.0	0.0	0.0	100.0
			Robust sign	+		+	+	+	+		+				
			Range	[11,18]		[9,22]	[57,68]	[16,24]	[73,91]		[78,91]				
33	Mediacal/Watches	28.8	FHK	25.7	29.5	55.1	18.6	6.4	25.0	19.9	44.9	−0.3	0.3	0.0	100.0
			GR	31.2	20.8	52.0	12.7	−16.8	−4.0	52.2	48.2	−0.9	0.7	−0.2	100.0
			DOP	27.3	99.7	126.9	−3.3	−79.5	−82.8	57.8	−25.0	−2.7	0.8	−1.9	100.0
			Robust sign	+	+	+				+		−	+		
			Range	[26,31]	[21,100]	[52,127]				[20,58]		[−3,−0.3]	[0.3,1]		
34	Moter Vehicles	−6.9	FHK	204.7	−30.4	174.2	7.9	−21.8	−14.0	−59.7	−73.7	1.4	−2.0	−0.6	100.0
			GR	125.6	56.2	181.8	5.8	−37.3	−31.5	−49.8	−81.3	1.1	−1.6	−0.5	100.0
			DOP	156.9	95.6	252.5	0.7	−76.1	−75.4	−75.1	−150.5	0.4	−2.5	−2.0	100.0
			Robust sign	+		+	+	−	−	−	−	+	−	−	
			Range	[126,205]		[174,253]	[1,8]	[−76,−22]	[−75,−32]	[−75,−50]	[−151,−74]	[0.4,1]	[−3,−2]	[−2,−1]	
35	Other Transport	52.8	FHK	67.0	28.2	95.2	0.7	2.4	3.1	1.1	4.1	0.7	0.0	0.7	100.0
			GR	81.9	11.4	93.3	−0.8	−2.7	−3.5	10.3	6.8	−0.2	0.1	−0.1	100.0
			DOP	41.5	70.5	111.9	−2.6	−9.2	−11.9	1.3	−10.6	−1.4	0.0	−1.4	100.0
			Robust sign	+	+	+				+					
			Range	[42,82]	[11,71]	[93,112]				[1,10]					
36	Furniture	7.8	FHK	82.9	103.4	186.3	−5.2	−30.5	−35.7	−58.8	−94.5	−2.4	10.6	8.2	100.0
			GR	148.8	28.4	177.3	−9.6	−49.9	−59.5	−27.0	−86.5	−4.1	13.3	9.2	100.0
			DOP	58.9	379.2	438.1	−30.3	−140.1	−170.4	−158.2	−328.6	−11.7	2.2	−9.5	100.0
			Robust sign	+	+	+	−	−	−	−	−	−	+		
			Range	[59,149]	[28,379]	[177,438]	[−30,−5]	[−140,−31]	[−170,−36]	[−158,−27]	[−329,−87]	[−12,−2]	[2,13]		

Table A-3: Decomposition of Labor Productivity Growth across States/UTs

			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
State/U.T.	Growth rate	Method	Within effect	Reallocation effect	Total CS effect (1)+(2)	EN	ES	Total entry effect (4)+(5)	Exit effect	Net entry effect (6)+(7)	SI	SO	Switching effect (9)+(10)	Total (3)+(8)+(11)
Andaman & N. Island	−16.7	FHK	44.1	131.6	175.7	−77.7	0.0	−77.7	2.1	−75.7	0.0	0.0	0.0	100.0
		GR	105.3	50.5	155.8	−103.3	0.0	−103.3	47.6	−55.8	0.0	0.0	0.0	100.0
		DOP	169.6	171.6	341.1	−264.0	0.0	−264.0	22.9	−241.1	0.0	0.0	0.0	100.0
		Robust sign	+	+	+	−		−	+	−				
		Range	[44,170]	[51,172]	[156,341]	[−264,−78]		[−264,−78]	[2,48]	[−241,−56]				
Andhra Pradesh	14.7	FHK	15.5	−2.7	12.9	32.1	45.3	77.4	9.0	86.4	0.2	0.5	0.7	100.0
		GR	20.6	0.4	21.0	28.0	23.2	51.2	27.2	78.4	−0.2	0.8	0.6	100.0
		DOP	27.5	5.3	32.8	28.2	24.1	52.3	14.5	66.8	−0.2	0.6	0.4	100.0
		Robust sign	+		+	+	+	+	+	+		+	+	
		Range	[16,28]		[13,33]	[28,32]	[23,45]	[51,77]	[9,27]	[67,86]		(0,1)	(0,1)	
Assam	93.9	FHK	4.3	11.6	15.9	5.3	60.0	65.3	18.8	84.1	0.0	0.0	0.0	100.0
		GR	6.9	2.4	9.3	3.6	47.6	51.2	39.5	90.7	0.0	0.0	0.0	100.0
		DOP	2.8	13.5	16.2	3.7	48.0	51.6	32.1	83.8	0.0	0.0	0.0	100.0
		Robust sign	+	+	+	+	+	+	+	+				
		Range	[3,7]	[2,14]	[9,16]	[4,5]	[48,60]	[51,65]	[19,40]	[84,91]				
Bihar	40.5	FHK	11.2	−5.3	5.9	−0.1	94.3	94.2	−0.1	94.1	0.0	0.0	0.0	100.0
		GR	8.5	17.6	26.1	−2.9	70.7	67.8	6.0	73.9	0.0	0.0	0.0	100.0
		DOP	9.0	3.3	12.3	−0.8	88.5	87.8	−0.1	87.7	0.0	0.0	0.0	100.0
		Robust sign	+		+	−	+	+		+				
		Range	[9,11]		[6,26]	[−3,0)	[71,94]	[68,94]		[74,94]				
Chandigarh(U.T.)		FHK												
		GR												
		DOP												
		Robust sign												
		Range												
Chattisgarh	29.0	FHK	26.6	64.9	91.5	−7.2	−2.0	−9.2	17.8	8.5	0.0	0.0	0.0	100.0
		GR	44.3	36.0	80.3	−13.9	−8.1	−21.9	41.6	19.7	0.0	0.0	0.0	100.0
		DOP	17.8	94.6	112.4	−26.6	−19.7	−46.3	34.0	−12.4	0.0	0.0	0.0	100.0
		Robust sign	+	+	+	−	−	−	+					
		Range	[18,44]	[36,95]	[80,112]	[−27,−7]	[−20,−2]	[−46,−9]	[18,42]					
Dadra & Nagar Haveli	14.1	FHK	31.2	−11.0	20.2	0.4	87.4	87.8	−8.0	79.8	−0.2	0.2	0.0	100.0
		GR	28.6	−2.4	26.2	−7.3	70.9	63.7	10.3	73.9	−0.4	0.3	−0.1	100.0
		DOP	46.0	−9.5	36.6	−3.3	79.4	76.1	−12.5	63.6	−0.3	0.2	−0.2	100.0
		Robust sign	+	−	+		+	+		+	−	+		
		Range	[29,46]	[−11,−2]	[20,37]		[71,87]	[64,88]		[64,80]	(−1,0)	(0,1)		
Daman & Diu	−4.8	FHK	47.2	−30.2	17.1	−65.9	101.9	36.0	53.1	89.1	6.2	−12.4	−6.2	100.0
		GR	29.6	5.0	34.6	−76.7	79.1	2.4	68.7	71.1	5.2	−10.9	−5.7	100.0
		DOP	−18.5	145.0	126.5	−106.5	15.8	−90.7	72.5	−18.2	2.2	−10.5	−8.3	100.0
		Robust sign			+	−	+		+		+	−	−	
		Range												
Delhi	−7.0	FHK	0.0	0.0	0.0	0.0	100.0	100.0	0.0	100.0	0.0	0.0	0.0	100.0
		GR	0.0	0.0	0.0	0.0	50.0	50.0	50.0	100.0	0.0	0.0	0.0	100.0
		DOP	0.0	0.0	0.0	0.0	−227.7	−227.7	327.7	100.0	0.0	0.0	0.0	100.0
		Robust sign								+				
		Range								[100,100]				
Goa	32.0	FHK	71.8	−22.0	49.8	2.4	48.9	51.2	−1.1	50.2	0.0	0.0	0.0	100.0
		GR	61.0	−2.7	58.3	1.0	25.9	26.9	14.8	41.7	0.0	0.0	0.0	100.0
		DOP	23.1	73.4	96.5	−0.2	5.3	5.1	−1.6	3.5	0.0	0.0	0.0	100.0
		Robust sign	+		+		+	+		+				
		Range	[23,72]		[50,97]		[5,49]	[5,51]		[4,50]				
Gujarat	70.9	FHK	23.6	−13.7	9.9	0.5	1.3	1.8	24.5	26.3	70.1	−6.3	63.8	100.0
		GR	20.1	0.1	20.2	−2.7	−4.8	−7.5	44.1	36.7	44.9	−1.8	43.1	100.0
		DOP	6.7	48.3	55.0	−5.2	−9.7	−14.9	38.3	23.4	24.7	−3.1	21.6	100.0
		Robust sign	+		+				+	+	+	−	+	
		Range	[7,24]		[10,55]				[25,44]	[23,37]	[25,70]	[−6,−2]	[22,64]	
Haryana	29.6	FHK	94.0	−23.8	70.2	0.5	23.0	23.5	5.1	28.6	1.3	−0.2	1.1	100.0
		GR	82.7	−0.1	82.6	−4.0	2.1	−1.9	18.8	16.8	0.4	0.2	0.6	100.0
		DOP	17.9	134.3	152.2	−13.9	−43.4	−57.3	7.0	−50.3	−1.7	−0.2	−1.9	100.0
		Robust sign	+		+				+					
		Range	[18,94]		[70,152]				[5,19]					
Himachal Pradesh	28.8	FHK	1.2	−4.9	−3.8	91.6	6.4	98.0	5.2	103.2	−0.2	0.8	0.6	100.0
		GR	1.1	17.9	19.0	64.1	−3.3	60.7	19.0	79.7	−0.5	1.8	1.3	100.0
		DOP	3.5	−3.1	0.4	86.7	4.7	91.4	7.5	98.9	−0.3	0.9	0.7	100.0
		Robust sign	+			+		+	+	+	−	+	+	
		Range	[1,4]			[64,92]		[61,98]	[5,19]	[80,103]	[−1,0)	[1,2]	(0,1]	
Jammu & Kashmir	30.9	FHK	1.7	−3.2	−1.6	104.7	−6.0	98.6	2.3	100.9	−0.1	0.7	0.7	100.0
		GR	1.1	28.1	29.1	86.6	−30.3	56.3	10.5	66.8	−0.2	4.2	4.0	100.0
		DOP	2.0	3.7	5.7	101.2	−10.7	90.5	2.9	93.4	−0.1	1.0	0.9	100.0
		Robust sign	+			+	−	+	+	+	−	+	+	
		Range	[1,2]			[87,105]	[−30,−6]	[56,99]	[2,11]	[67,101]	(−1,0)	[1,4]	[1,4]	
Jharkhand	*	FHK	68.6	−10.9	57.7	0.1	35.2	35.3	7.0	42.3	0.0	0.0	0.0	100.0
		GR	62.6	6.1	68.7	−3.1	14.0	11.0	20.4	31.3	0.0	0.0	0.0	100.0
		DOP	66.4	50.1	116.6	−7.9	−18.2	−26.1	9.5	−16.6	0.0	0.0	0.0	100.0
		Robust sign	+		+				+					
		Range	[63,69]		[58,117]				[7,20]					
Karnataka	**	FHK	23.6	23.5	47.1	3.4	38.3	41.8	11.1	52.9	0.0	0.0	0.0	100.0
		GR	32.7	7.1	39.8	−0.8	20.8	20.0	40.1	60.2	0.0	0.0	0.0	100.0
		DOP	16.6	59.9	76.5	−5.3	2.3	−3.0	26.5	23.5	0.0	0.0	0.0	100.0
		Robust sign	+	+	+		+		+	+				
		Range	[17,33]	[7,60]	[40,77]		[2,38]		[11,40]	[24,60]				

			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
State/U.T.	Growth rate	Method	Within effect	Reallocation effect	Total CS effect (1)+(2)	EN	ES	Total entry effect (4)+(5)	Exit effect	Net entry effect (6)+(7)	SI	SO	Switching effect (9)+(10)	Total (3)+(8)+(11)
Kerala	**	FHK	97.1	4.0	101.1	0.8	12.5	13.3	−14.4	−1.1	0.0	0.0	0.0	100.0
		GR	104.2	−4.4	99.8	0.2	3.6	3.9	−3.7	0.2	0.0	0.0	0.0	100.0
		DOP	3.7	121.4	125.0	−0.4	−6.4	−6.8	−18.3	−25.0	0.0	0.0	0.0	100.0
		Robust sign	+		+				−					
		Range	[4,104]		[100,125]				[−18,−4]					
Madhya Pradesh	−2.2	FHK	−15.6	76.3	60.7	−0.5	124.4	123.9	−84.6	39.3	0.0	0.0	0.0	100.0
		GR	−3.1	70.1	67.0	−0.8	105.7	104.9	−72.0	33.0	0.0	0.0	0.0	100.0
		DOP	−62.3	137.2	74.9	−0.2	138.8	138.5	−113.4	25.1	0.0	0.0	0.0	100.0
		Robust sign	−	+	+	−	+	+	−	+				
		Range	[−62,−3]	[70,137]	[61,75]	[−1,0)	[106,139]	[105,139]	[−113,−72]	[25,40]				
Maharashtra	46.3	FHK	62.8	38.0	100.7	−0.6	−2.9	−3.5	2.8	−0.7	−0.2	0.2	0.0	100.0
		GR	78.0	30.1	108.0	−3.8	−18.1	−22.0	14.6	−7.4	−1.4	0.8	−0.7	100.0
		DOP	3.6	163.1	166.8	−11.6	−54.9	−66.5	3.8	−62.7	−4.3	0.2	−4.0	100.0
		Robust sign	+	+	+	−	−	−	+	−	−	+		
		Range	[4,78]	[30,163]	[101,167]	[−12,−1]	[−55,−3]	[−67,−4]	[3,15]	[−63,−1]	[−4,0)	(0,1]		
Manipur	−0.4	FHK	−436.8	432.1	−4.7	117.6	31.8	149.4	−44.7	104.7	0.0	0.0	0.0	100.0
		GR	−252.5	277.4	24.9	112.6	5.3	117.9	−42.8	75.1	0.0	0.0	0.0	100.0
		DOP	−1102.2	1015.4	−86.9	131.1	102.3	233.3	−46.5	186.9	0.0	0.0	0.0	100.0
		Robust sign	−	+		+	+	+	−	+				
		Range	[−1102,−253]	[277,1015]		[113,131]	[5,102]	[118,233]	[−47,−43]	[75,187]				
Meghalaya	29.5	FHK	−1.5	8.2	6.8	100.5	0.5	101.0	−7.8	93.2	0.0	0.0	0.0	100.0
		GR	−0.6	34.2	33.6	68.6	−13.0	55.6	10.3	65.9	−0.1	0.6	0.5	100.0
		DOP	5.4	−4.5	0.9	107.9	3.7	111.6	−12.4	99.2	0.0	−0.2	−0.1	100.0
		Robust sign			+	+		+		+				
		Range			[1,34]	[69,108]		[56,112]		[66,99]				
Nagaland	11.0	FHK	6.8	−7.1	−0.3	86.1	5.7	91.8	8.5	100.3	0.0	0.0	0.0	100.0
		GR	7.9	−6.2	1.7	81.1	2.9	84.0	14.3	98.3	0.0	0.0	0.0	100.0
		DOP	22.4	−22.3	0.1	85.1	5.2	90.3	9.6	99.9	0.0	0.0	0.0	100.0
		Robust sign	+	−		+	+	+	+	+				
		Range	[7,22]	[−22,−6]		[81,86]	[3,6]	[84,92]	[9,14]	[98,100]				
Orissa	7.2	FHK	93.3	−21.0	72.3	−7.0	53.0	46.0	−18.3	27.7	0.0	0.0	0.0	100.0
		GR	78.0	0.9	78.9	−27.0	44.6	17.6	3.6	21.1	0.0	0.0	0.0	100.0
		DOP	35.5	122.4	157.9	−57.2	32.0	−25.3	−32.6	−57.9	0.0	0.0	0.0	100.0
		Robust sign	+		+	−	+							
		Range	[36,93]		[72,158]	[−57,−7]	[32,53]							
Pondicherry	111.2	FHK	4.5	−3.2	1.3	−0.1	98.4	98.3	0.3	98.6	0.0	0.1	0.1	100.0
		GR	3.1	13.7	16.8	−3.4	69.5	66.1	15.5	81.6	−0.5	2.1	1.6	100.0
		DOP	1.6	2.7	4.3	−0.4	95.6	95.2	0.4	95.6	−0.1	0.1	0.0	100.0
		Robust sign	+		+	−	+	+	+	+		+		
		Range	[2,5]		[1,17]	[−3,0)	[70,98]	[66,98]	(0,16]	[82,99]		(0,2]		
Punjab	27.3	FHK	49.7	14.3	64.0	0.8	39.4	40.2	−4.2	36.0	0.0	0.0	0.0	100.0
		GR	54.9	15.1	70.0	−1.5	20.8	19.3	10.7	30.0	0.0	0.1	0.0	100.0
		DOP	31.0	77.9	108.9	−3.9	1.0	−2.9	−6.0	−8.9	0.0	0.0	0.0	100.0
		Robust sign	+	+	+		+							
		Range	[31,55]	[14,78]	[64,109]		[1,39]							
Rajasthan	15.6	FHK	27.1	5.6	32.6	−1.1	51.6	50.5	16.9	67.4	0.0	0.0	0.0	100.0
		GR	32.7	1.2	33.8	−2.9	39.7	36.8	29.4	66.2	0.0	0.0	0.0	100.0
		DOP	29.8	15.9	45.7	−3.6	35.4	31.8	22.5	54.3	0.0	0.0	0.0	100.0
		Robust sign	+	+	+	−	+	+	+	+				
		Range	[27,33]	[1,16]	[33,46]	[−4,−1]	[35,52]	[32,51]	[17,29]	[54,67]				
Tamil Nadu	14.7	FHK	64.2	34.1	98.3	2.3	−7.5	−5.2	6.7	1.6	0.0	0.1	0.1	100.0
		GR	76.9	22.2	99.1	0.5	−20.5	−20.0	20.9	0.8	−0.1	0.2	0.1	100.0
		DOP	19.0	121.5	140.5	−3.1	−46.6	−49.7	9.4	−40.3	−0.4	0.1	−0.2	100.0
		Robust sign	+	+	+		−	−	+			+		
		Range	[19,77]	[22,122]	[98,141]		[−47,−8]	[−50,−5]	[7,21]			(0,1)		
Tripura	69.3	FHK	3.1	−1.0	2.1	91.8	6.8	98.6	−0.1	98.4	−0.6	0.0	−0.6	100.0
		GR	2.7	22.7	25.4	69.0	−9.4	59.7	9.0	68.7	−2.2	8.1	5.9	100.0
		DOP	3.8	7.1	10.9	86.9	3.3	90.2	−0.2	90.0	−1.0	0.0	−0.9	100.0
		Robust sign	+		+	+		+		+	−			
		Range	[3,4]		[2,25]	[68,92]		[60,99]		[69,98]	[−2,−1]			
Uttar Pradesh	14.5	FHK	54.2	2.7	56.9	10.2	35.6	45.8	−2.7	43.1	0.0	0.0	0.0	100.0
		GR	60.9	−1.1	59.8	5.9	18.2	24.1	16.1	40.2	0.0	0.0	0.0	100.0
		DOP	23.7	76.4	100.1	1.9	2.3	4.2	−4.3	−0.1	0.0	0.0	0.0	100.0
		Robust sign	+		+	+	+	+						
		Range	[24,61]		[57,100]	[2,10]	[2,36]	[4,46]						
Uttaranchal	37.7	FHK	27.0	3.1	30.1	45.2	20.9	66.2	3.7	69.9	0.0	0.0	0.0	100.0
		GR	27.1	18.6	45.7	24.8	7.4	32.2	22.1	54.3	0.0	0.0	0.0	100.0
		DOP	19.4	80.3	99.7	2.1	−7.7	−5.6	5.9	0.3	0.0	0.0	0.0	100.0
		Robust sign	+	+	+	+			+	+				
		Range	[19,27]	[3,80]	[30,100]	[2,45]			[4,22]	(0,70]				
West Bengal	16.4	FHK	−17.3	10.4	−7.0	−1.1	116.9	115.8	−8.8	107.0	0.0	0.0	0.0	100.0
		GR	−16.2	16.5	0.2	−9.5	88.5	79.0	20.7	99.8	0.0	0.0	0.0	100.0
		DOP	0.2	−38.1	−38.0	8.8	150.7	159.5	−21.5	138.0	0.0	0.0	0.0	100.0
		Robust sign					+	+		+				
		Range					[89,151]	[79,160]		[100,138]				

Table A-4: Decomposition of Total Factor Productivity Growth across States/UTs

State/U.T.	Growth rate	Method	(1) Within effect	(2) Reallocation effect	(3) Total CS effect (1)+(2)	(4) EN	(5) ES	(6) Total entry effect (4)+(5)	(7) Exit effect	(8) Net entry effect (6)+(7)	(9) SI	(10) SO	(11) Switching effect (9)+(10)	(12) Total (3)+(8)+(11)
Andaman & N. Island	*	FHK	0.7	40.9	41.6	49.6	0.0	49.6	8.8	58.4	0.0	0.0	0.0	100.0
		GR	1.7	20.0	21.7	24.0	0.0	24.0	54.3	78.3	0.0	0.0	0.0	100.0
		DOP	3.0	2.6	5.6	−3.3	0.0	−3.3	97.7	94.4	0.0	0.0	0.0	100.0
		Robust sign	+	+	+				+	+				
		Range	[1,3]	[3,41]	[6,41]				[9,98]	[59,94]				
Andhra Pradesh	9.0	FHK	19.4	0.4	19.8	−3.3	74.5	71.2	8.2	79.4	0.1	0.7	0.8	100.0
		GR	37.4	−9.2	28.2	−7.4	52.3	44.9	26.2	71.1	−0.3	1.0	0.7	100.0
		DOP	52.0	−4.6	47.5	−8.4	47.2	38.8	13.2	52.1	−0.4	0.8	0.4	100.0
		Robust sign	+		+	−	+	+	+	+		+	+	
		Range	[19,52]		[20,48]	[−8,−3]	[47,75]	[39,71]	[8,26]	[52,79]		[1,1]	(0,1)	
Assam	49.4	FHK	0.1	1.8	1.9	5.1	91.3	96.4	1.8	98.1	0.0	0.0	0.0	100.0
		GR	0.6	−5.5	−4.9	3.5	78.7	82.2	22.7	104.9	0.0	0.0	0.0	100.0
		DOP	1.4	0.7	2.1	4.9	90.0	94.9	3.0	97.9	0.0	0.0	0.0	100.0
		Robust sign	+			+	+	+	+	+				
		Range	(0,1]			[4,5]	[79,91]	[82,96]	[2,23]	[98,105]				
Bihar	−4.8	FHK	−177.2	79.5	−97.8	7.7	175.6	183.3	14.5	197.8	0.0	0.0	0.0	100.0
		GR	−136.6	59.1	−77.5	4.9	152.0	156.9	20.6	177.5	0.0	0.0	0.0	100.0
		DOP	−146.5	−46.6	−193.1	17.8	258.8	276.6	16.5	293.1	0.0	0.0	0.0	100.0
		Robust sign	−		−	+	+	+	+	+				
		Range	[−177,137]		[−193,−78]	[5,18]	[152,259]	[157,277]	[15,21]	[178,293]				
Chandigarh(U.T.)		FHK												
		GR												
		DOP												
		Robust sign												
		Range												
Chattisgarh	24.3	FHK	34.9	52.3	87.2	−7.7	−3.5	−11.2	24.0	12.8	0.0	0.0	0.0	100.0
		GR	50.4	25.6	76.0	−14.2	−9.6	−23.8	47.8	24.0	0.0	0.0	0.0	100.0
		DOP	37.9	64.9	102.8	−27.1	−21.6	−48.7	45.9	−2.8	0.0	0.0	0.0	100.0
		Robust sign	+	+	+	−	−	−	+					
		Range	[35,50]	[26,65]	[76,103]	[−27,−8]	[−22,−4]	[−49,−11]	[48,24]					
Dadra & Nagar Haveli	21.5	FHK	23.9	−11.0	12.9	8.8	83.7	92.5	−5.4	87.1	−0.1	0.1	0.0	100.0
		GR	22.4	−3.8	18.7	1.6	67.1	68.6	12.8	81.4	−0.3	0.2	−0.1	100.0
		DOP	27.7	−4.6	23.1	6.7	78.8	85.5	−8.5	77.0	−0.2	0.1	−0.1	100.0
		Robust sign	+	−	+	+	+	+		+	−	+		
		Range	[23,28]	[−11,−4]	[13,23]	[2,9]	[67,84]	[69,93]		[77,87]	(−1,0)	(0,1)		
Daman & Diu	−7.7	FHK	35.1	−8.9	26.1	42.1	24.9	67.0	10.7	77.7	5.5	−9.3	−3.8	100.0
		GR	20.3	23.4	43.7	31.4	2.0	33.4	26.2	59.6	4.4	−7.8	−3.3	100.0
		DOP	−5.1	92.3	87.3	23.1	−16.0	7.0	11.4	18.4	3.6	−9.3	−5.7	100.0
		Robust sign			+	+		+	+	+	+	−	−	
		Range			[26,87]	[23,42]		[7,67]	[11,26]	[18,78]	[4,6]	[−9,−8]	[−6,−3]	
Delhi	39.7	FHK	0.0	0.0	0.0	0.0	100.0	100.0	0.0	100.0	0.0	0.0	0.0	100.0
		GR	0.0	0.0	0.0	0.0	50.0	50.0	50.0	100.0	0.0	0.0	0.0	100.0
		DOP	0.0	0.0	0.0	0.0	123.2	123.2	−23.2	100.0	0.0	0.0	0.0	100.0
		Robust sign					+	+		+				
		Range					[50,123]	[50,123]		[100,100]				
Goa	36.0	FHK	96.4	−29.7	66.7	−0.5	28.2	27.7	5.6	33.3	0.0	0.0	0.0	100.0
		GR	82.5	−7.2	75.3	−1.7	5.0	3.3	21.4	24.7	0.0	0.0	0.0	100.0
		DOP	33.3	99.7	132.9	−3.8	−37.3	−41.1	8.1	−32.9	0.0	0.0	0.0	100.0
		Robust sign	+		+	−			+					
		Range	[33,96]		[67,133]	[−4,−1]			[6,21]					
Gujarat	6.0	FHK	382.2	−208.4	173.8	−2.5	0.4	−2.1	84.8	82.7	−149.0	−7.4	−156.5	100.0
		GR	300.7	−116.5	184.2	−5.6	−5.7	−11.3	104.3	93.0	−174.2	−3.0	−177.2	100.0
		DOP	75.3	579.5	654.8	−52.4	−97.4	−149.7	142.9	−6.8	−553.9	5.9	−548.0	100.0
		Robust sign	+		+	−		−	+		−		−	
		Range	[75,382]		[174,655]	[−52,−3]		[−150,−2]	[85,143]		[−554,−149]		[−548,−157]	
Haryana	25.8	FHK	31.0	−0.2	30.8	2.4	69.3	71.7	−2.2	69.5	−0.7	0.4	−0.3	100.0
		GR	29.6	13.6	43.2	−2.2	48.5	46.3	11.4	57.7	−1.7	0.8	−0.8	100.0
		DOP	78.4	−14.5	63.9	−3.2	43.7	40.5	−2.9	37.6	−1.9	0.4	−1.5	100.0
		Robust sign	+		+		+	+		+		+	−	
		Range	[30,78]		[31,64]		[44,69]	[41,72]		[38,70]		(0,1)	[−2,0)	
Himachal Pradesh	36.7	FHK	−2.9	−2.5	−5.4	74.2	25.3	99.5	5.4	105.0	0.0	0.5	0.5	100.0
		GR	−1.2	18.5	17.3	46.9	15.5	62.4	19.2	81.6	−0.4	1.5	1.1	100.0
		DOP	−2.4	−4.0	−6.4	73.1	24.9	98.0	7.8	105.8	−0.1	0.7	0.6	100.0
		Robust sign	−			+	+	+	+	+		+	+	
		Range	[−3,−1]			[47,74]	[16,25]	[62,100]	[5,19]	[82,106]		[1,2]	[1,1]	
Jammu & Kashmir	16.4	FHK	28.8	−25.8	3.0	102.5	−15.2	87.3	10.5	97.8	−0.2	−0.5	−0.7	100.0
		GR	18.3	15.2	33.5	85.0	−39.9	45.1	18.7	63.8	−0.3	2.9	2.6	100.0
		DOP	7.2	63.7	70.9	73.1	−56.6	16.5	12.6	29.1	−0.4	0.4	0.0	100.0
		Robust sign	+		+	+	−	+	+	+	−			
		Range	[7,29]		[3,71]	[73,103]	[−57,−15]	[17,87]	[11,19]	[29,98]	(−1,0)			
Jharkhand	9.9	FHK	17.5	−12.9	4.6	−4.6	105.1	100.5	−5.1	95.4	0.0	0.0	0.0	100.0
		GR	14.4	1.4	15.8	−7.8	84.0	76.2	8.0	84.2	0.0	0.0	0.0	100.0
		DOP	114.6	−108.7	5.9	−4.5	105.6	101.0	−6.9	94.1	0.0	0.0	0.0	100.0
		Robust sign	+		+	−	+	+		+				
		Range	[14,115]		[5,16]	[−8,−5]	[84,106]	[76,101]		[84,95]				
Karnataka	9.6	FHK	72.8	47.1	119.9	−0.3	7.6	7.4	−27.3	−19.9	0.0	0.0	0.0	100.0
		GR	101.6	11.1	112.7	−4.4	−9.9	−14.3	1.6	−12.7	0.0	0.0	0.0	100.0
		DOP	85.5	143.2	228.7	−13.9	−49.8	−63.7	−64.9	−128.7	0.0	0.0	0.0	100.0
		Robust sign	+	+	+	−				−				
		Range	[73,102]	[11,142]	[113,229]	[−14,0)				[−129,−13]				

State/U.T.	Growth rate	Method	(1) Within effect	(2) Reallocation effect	(3) Total CS effect (1)+(2)	(4) EN	(5) ES	(6) Total entry effect (4)+(5)	(7) Exit effect	(8) Net entry effect (6)+(7)	(9) SI	(10) SO	(11) Switching effect (9)+(10)	(12) Total (3)+(8)+(11)
Kerala	7.0	FHK	6.0	−42.2	−36.2	−1.8	116.0	114.1	22.0	136.2	0.0	0.0	0.0	100.0
		GR	19.0	−56.6	−37.6	−2.4	107.1	104.7	32.8	137.6	0.0	0.0	0.0	100.0
		DOP	102.8	−148.4	−45.5	−1.6	119.0	117.4	28.1	145.5	0.0	0.0	0.0	100.0
		Robust sign	+	−	−	−	+	+	+	+				
		Range	[6,103]	[−148,−42]	[−46,−36]	[−2,−2]	[107,119]	[105,117]	[22,33]	[146,136]				
Madhya Pradesh	2.3	FHK	105.5	118.0	223.5	−0.1	−95.2	−95.2	−28.2	−123.5	0.0	0.0	0.0	100.0
		GR	131.7	95.4	227.1	−0.4	−114.1	−114.5	−12.6	−127.1	0.0	0.0	0.0	100.0
		DOP	231.9	126.4	358.3	−1.9	−215.3	−217.2	−41.1	−258.3	0.0	0.0	0.0	100.0
		Robust sign	+	+	+	−	−	−	−	−				
		Range	[106,232]	[95,126]	[224,358]	[−2,0)	[−215,−95]	[−217,−95]	[−41,−13]	[−258,−124]				
Maharashtra	1.3	FHK	534.1	−326.6	207.6	−40.9	−70.8	−111.7	31.5	−80.2	−25.9	−1.5	−27.4	100.0
		GR	545.0	−330.2	214.8	−44.1	−86.1	−130.2	43.3	−86.9	−27.1	−0.9	−28.0	100.0
		DOP	328.0	23.2	351.1	−65.7	−190.2	−255.9	40.9	−215.0	−35.2	−1.0	−36.2	100.0
		Robust sign	+		+	−	−	−	+	−	−	−	−	
		Range	[328,545]		[208,351]	[−66,−41]	[−190,−71]	[−256,−112]	[31,43]	[−215,−80]	[−35,−26]	[−2,−1]	[−36,−27]	
Manipur	−10.6	FHK	−17.5	39.4	21.8	18.7	66.0	84.7	−6.5	78.2	0.0	0.0	0.0	100.0
		GR	−10.5	61.9	51.4	13.6	39.6	53.2	−4.6	48.6	0.0	0.0	0.0	100.0
		DOP	−26.4	74.5	48.1	14.5	44.2	58.7	−6.8	51.9	0.0	0.0	0.0	100.0
		Robust sign	−	+	+	+	+	+	−	+				
		Range	[−26,−11]	[39,75]	[22,51]	[14,19]	[40,66]	[53,85]	[−7,−5]	[49,78]				
Meghalaya	37.9	FHK	−0.2	3.7	3.4	97.2	3.0	100.3	−3.8	96.5	0.0	0.1	0.1	100.0
		GR	0.1	30.1	30.2	65.4	−10.5	54.9	14.3	69.1	−0.1	0.8	0.7	100.0
		DOP	9.4	−6.8	2.5	99.4	4.0	103.4	−6.0	97.4	0.0	0.0	0.1	100.0
		Robust sign			+	+		+		+			+	
		Range			[3,30]	[65,99]		[55,103]		[69,97]			(0,1)	
Nagaland	14.8	FHK	127.9	−26.0	102.0	−10.0	2.0	−8.0	6.1	−2.0	0.0	0.0	0.0	100.0
		GR	118.5	−12.3	106.2	−14.9	−0.9	−15.8	9.6	−6.2	0.0	0.0	0.0	100.0
		DOP	18.8	102.6	121.4	−22.7	−5.3	−28.0	6.5	−21.4	0.0	0.0	0.0	100.0
		Robust sign	+		+	−		−	+	−				
		Range	[19,128]		[102,121]	[−23,−10]		[−28,−8]	[6,10]	[−21,−2]				
Orissa	−5.1	FHK	−58.2	7.2	−51.1	98.4	−31.5	66.9	84.2	151.1	0.0	0.0	0.0	100.0
		GR	−48.3	4.1	−44.2	78.4	−40.0	38.4	105.7	144.2	0.0	0.0	0.0	100.0
		DOP	−179.8	108.7	−71.0	67.7	−44.5	23.2	147.8	171.0	0.0	0.0	0.0	100.0
		Robust sign	−	+	−	+	−	+	+	+				
		Range	[−180,−48]	[4,109]	[−71,−44]	[68,98]	[−45,−32]	[23,67]	[84,148]	[144,171]				
Pondicherry	86.6	FHK	7.2	−4.7	2.5	−0.2	96.9	96.7	0.7	97.3	0.0	0.2	0.1	100.0
		GR	5.1	13.4	18.5	−3.5	68.0	64.4	15.3	79.8	−0.5	2.2	1.7	100.0
		DOP	3.1	5.3	8.4	−0.8	91.3	90.4	1.0	91.5	−0.1	0.2	0.1	100.0
		Robust sign	+		+	−	+	+	+	+		+	+	
		Range	[3,7]		[3,19]	[−4,0)	[68,97]	[64,97]	[1,15]	[80,97]		(0,2]	(0,2]	
Punjab	24.4	FHK	49.3	−1.0	48.3	1.1	60.1	61.2	−9.5	51.7	0.0	0.0	0.0	100.0
		GR	48.1	6.1	54.2	−1.2	41.6	40.4	5.4	45.7	0.0	0.1	0.0	100.0
		DOP	24.8	55.3	80.1	−2.0	35.5	33.5	−13.6	19.9	0.0	0.0	0.0	100.0
		Robust sign	+		+		+	+		+				
		Range	[25,49]		[48,80]		[36,60]	[34,61]		[20,52]				
Rajasthan	9.4	FHK	90.0	5.8	95.8	−3.2	−22.2	−25.4	29.7	4.2	0.0	0.0	0.0	100.0
		GR	97.1	−0.1	97.0	−5.0	−34.1	−39.1	42.2	3.0	0.0	0.0	0.0	100.0
		DOP	63.9	69.3	133.2	−9.4	−63.3	−72.7	39.6	−33.2	0.0	0.0	0.0	100.0
		Robust sign	+		+	−	−	−	+					
		Range	[64,97]		[96,133]	[−9,−3]	[−63,−22]	[−73,−25]	[30,42]					
Tamil Nadu	6.1	FHK	66.9	15.2	82.1	−0.5	24.9	24.4	−6.2	18.2	−0.6	0.3	−0.3	100.0
		GR	105.8	−23.1	82.8	−2.3	11.8	9.5	8.1	17.6	−0.7	0.3	−0.4	100.0
		DOP	110.4	6.8	117.2	−4.3	−3.7	−8.0	−8.6	−16.6	−0.8	0.3	−0.6	100.0
		Robust sign	+		+	−					−	+	−	
		Range	[67,110]		[82,117]	[−4,−1]					[−1,−1]	(0,0.3]	[−1,0)	
Tripura	74.6	FHK	1.3	2.0	3.2	33.7	65.4	99.0	−2.9	96.2	−0.2	0.8	0.6	100.0
		GR	1.5	24.9	26.4	11.0	49.2	60.2	6.3	66.5	−1.8	8.9	7.1	100.0
		DOP	2.9	6.4	9.3	30.9	63.4	94.3	−3.4	90.8	−0.4	0.3	−0.1	100.0
		Robust sign	+	+	+	+	+	+		+	−	+		
		Range	[1,3]	[2,25]	[3,26]	[11,34]	[49,65]	[60,99]		[67,96]	[−2,0)	(0,9]		
Uttar Pradesh	15.9	FHK	49.6	−7.9	41.7	2.9	61.5	64.4	−6.1	58.3	0.0	0.0	0.0	100.0
		GR	48.7	−6.1	42.6	−0.9	43.8	42.9	14.5	57.4	0.0	0.0	0.0	100.0
		DOP	24.2	48.7	72.9	−1.9	39.4	37.5	−10.4	27.1	0.0	0.0	0.0	100.0
		Robust sign	+		+		+	+		+				
		Range	[24,50]		[42,73]		[39,62]	[38,64]		[27,58]				
Uttaranchal	56.4	FHK	9.6	4.1	13.8	79.8	3.0	82.8	3.4	86.2	0.0	0.0	0.0	100.0
		GR	11.6	17.1	28.7	60.6	−11.1	49.5	21.8	71.3	0.0	0.0	0.0	100.0
		DOP	−1.0	47.0	46.0	60.1	−11.5	48.5	5.4	54.0	0.0	0.0	0.0	100.0
		Robust sign		+	+	+		+	+	+				
		Range		[4,47]	[14,46]	[60,80]		[49,83]	[3,22]	[54,86]				
West Bengal	−0.6	FHK	−231.2	−289.3	−520.5	504.8	−1005.9	−501.1	1121.6	620.5	0.0	0.0	0.0	100.0
		GR	−174.2	−339.2	−513.3	496.4	−1034.3	−537.8	1151.2	613.3	0.0	0.0	0.0	100.0
		DOP	−838.7	362.0	−476.7	126.9	−2292.1	−2165.2	2741.9	576.7	0.0	0.0	0.0	100.0
		Robust sign	−		−	+	−	−	+	+				
		Range	[−839,−174]		[−521,−477]	[127,505]	[−2292,−1006	[−2165,−501]	[1122,2742]	[577,621]				