

**A Study of Employment Dynamics, Labour Productivity
And Structural Change in Bihar, (1993-2017)**

**A Thesis Submitted to the University of Hyderabad in Partial Fulfillment
of the Requirements for the Award of the Degree of**

DOCTOR OF PHILOSOPHY

IN

ECONOMICS

By

DHANANJAY KUMAR

(Registration No. 16SEPH08)



**SCHOOL OF ECONOMICS
UNIVERSITY OF HYDERABAD
HYDERABAD-500046, INDIA
JUNE, 2022**

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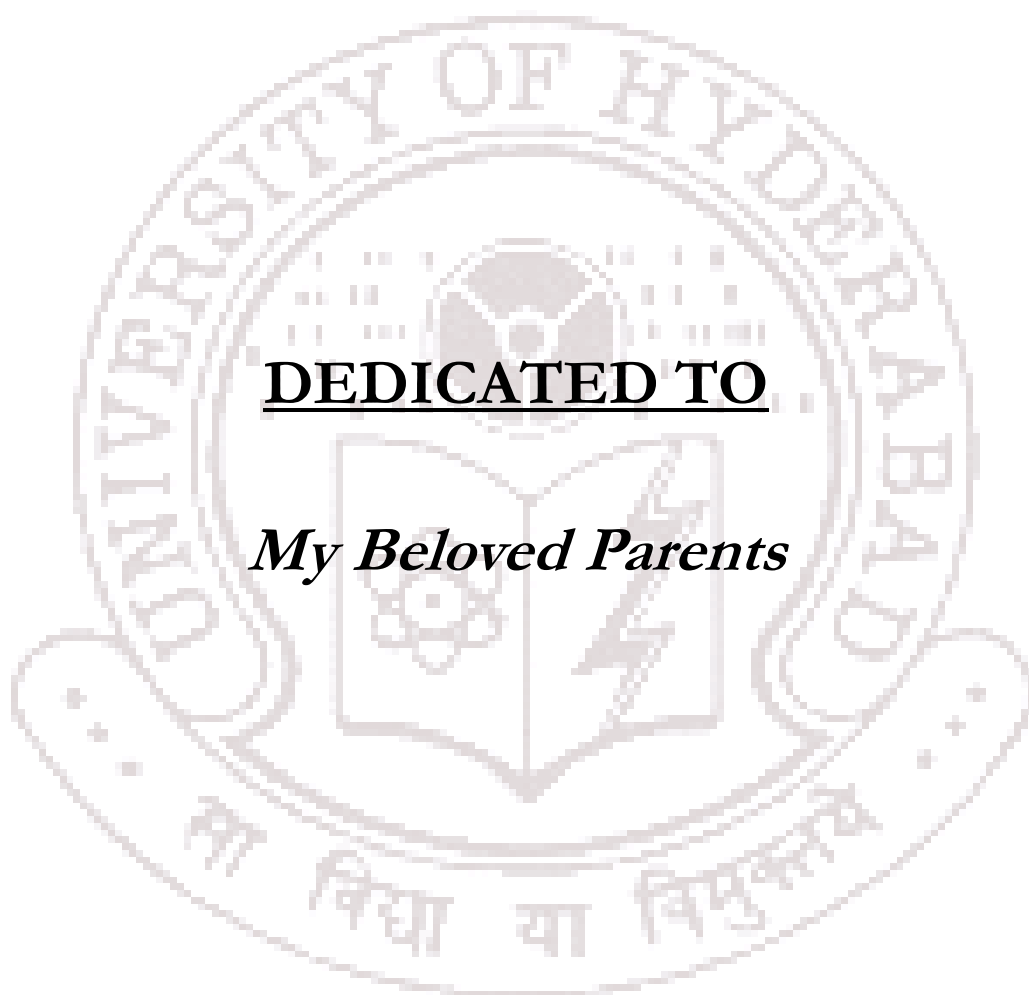
**DOCTOR OF PHILOSOPHY
IN
ECONOMICS**

**By
DHANANJAY KUMAR
(Registration No. 16SEPH08)**

**Under the Supervision of
Prof. R. V. RAMANA MURTHY**



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HYDERABAD-500046, INDIA
JUNE, 2022**





DECLARATION

I, Dhananjay Kumar, hereby declare that the research embodied in the present thesis entitled ***“A Study of Employment Dynamics, Labour Productivity And Structural Change in Bihar, (1993-2017)”*** is an original research work carried out by me under the supervision of Prof. R. V. Ramana Murthy, School of Economics, for the award of **Doctor of Philosophy in Economics** from University of Hyderabad. I also declare to the best of my knowledge that the thesis has not been earlier submitted either in part or full to any other university or institutions for the award of any research degree or diploma in full or partial fulfilment in any other university or institution. I hereby declare that my thesis can be deposited in Shodganga/INFLIBNET.

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Dhananjay Kumar

Registration No: 16SEPH08



CERTIFICATE

This is to certify that the thesis entitled “*A Study of Employment Dynamics, Labour Productivity And Structural Change in Bihar, (1993-2017)*” submitted by **Mr. Dhananjay Kumar** bearing registration number **16SEPH08** in partial fulfillment of the requirements for award of **Doctor of Philosophy in Economics** at the *School of Economics, University of Hyderabad* is a bonafide work carried out by him under my supervision and guidance. This thesis is free from plagiarism and has not been submitted previously in part or in full to this or any other university or institution for award of any degree or diploma.

Paper related to this thesis has been published

A. PAPER PUBLISHED IN THE FOLLOWING PUBLICATION:

1. Kumar, D., (2020), Structural change, Employment and Economic growth in Bihar, India: A disaggregated sector-wise analysis, SSRG International Journal of Economics and Management Studies (SSRG-IJEMS), ISSN 2393 – 9125 volume 07. Issue .08, pp.187-196
2. Rupakula, R. M. V., & Kumar, D. (2021). Impact of COVID-19 Lockdown on Migrant Labourers from Bihar in Hyderabad. Journal of Rural Development, 40(1), 14-27
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B. RESEARCH PAPER PRESENTED IN THE FOLLOWING CONFERENCES:

1. Presented a paper on “Structural Change and Economic Growth: An Empirical Evidence for Bihar’s Economy” in 55th Annual Conference of the Indian Econometric Society (TIES) at the NISM Patalganga, campus organized by The Mumbai School of Economics and Public Policy, University of Mumbai and National Institute of Securities Markets, from 8-10 january, 2019.

2. Presented a paper on “Retrospect and Prospect of Structural Changes in Bihar’s Economy” in International Conference by School of Economics, Shri Mata Vaishno Devi University in Collaboration with Indian Economic Association (IEA), from 23-24 February, 2018.

Further, the student has passed the following courses towards fulfillment of the coursework requirement for the degree of Ph.D.

Sl.No	Course Code	Course Title	Credits	Result
01	EC-801	Advanced Economic Theory	4	Pass
02	EC-802	Social Accounting and Data Base	4	Pass
03	EC-803	Research Methodology	4	Pass
04	EC-851	Study Area Paper	4	Pass
05	Total Credits		16	Pass



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Getting a doctoral degree is pride in one's life and I feel fortunate to pursue such a prestigious degree from a reputed university. I would probably be the first person in my family lineage to be a doctorate. Undertaking this degree has been life-changing and thought-provoking for me, and it would not have been possible to complete it without the support, love, co-operation and guidance I received from many people.

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Finally, I would like to add that I am alone responsible for the errors and omissions in the study and none other may be blamed for it.

Dhananjay Kumar

25th Jun, 2022

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LIST OF ABBREVIATIONS

DNA	Deoxyribonucleic acid
LPG	Liberalisation, Privatisation, Globalisation
BIMARU	Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh
EPWRF	Economic & Political Weekly Research Foundation
AGR	Agriculture and Allied Activities
MIN	Mining and Quarrying
MAN	Manufacturing
CON	Construction
EGW	Electricity, Gas and Water supply
TSC	Transport Storage and Communication
THR	Trade, Hotels and Restaurants
FIRB	Banking and Insurance, Real Estate, Ownership of Dwellings and Business Services
PAD	Public Administration
OS	Other Services
GSDP	Gross State Domestic Product
GSVA	Gross State Value Addition
MOSPI	Ministry of Statistics and Programme Implementation
AAGR	Annual Average Growth Rate
CAAGR	Compound Annual Average Growth Rate
SDP	State Domestic Product
AE	Aggregate Expenditure
CE	Capital Expenditure
SSE	Social Sector Expenditure
VE	Village Electrified
EG	Electricity Generation
ICP	Installed Capacity of Power
CBR	Crude Birth rate
TFR	Total Fertility Rate
GRR	Gross Reproductively Rate
TMFR	Total Maternal Fertility Rate

IMR	Infant Mortality Rate
SRS	Sample Registration System
NFHS	National Family Health Survey
NSSO	National Sample Survey Office
NSS	National Sample Survey
EUS	Employment and Unemployment Survey
PLFS	Periodic Labour Force Survey
US	Usual Activity Status
CWS	Current Weekly Status
CDS	Current Daily Status
MGNREG	Mahatma Gandhi National Rural Employment Guarantee
PS	Principal Status
SS	Subsidiary Status
WPR	Worker Population Ratio
LFPR	Labour Force Participation Ratio
PU	Proportion Unemployed
IR	Inactivity Rate
UR	Unemployment Rate
ST/SC	Scheduled Tribe/ Scheduled Caste
OBC	Other Backward Castes
MPCE	Monthly Per capita Consumption Expenditure
LSM	Legislators, senior officials and managers
PRO	Professionals
TAP	Technicians and associate professionals
CRW	Clerks
SSW	Service workers and shop & market sales workers
SAFW	Skilled agricultural and fishery workers
CRT	Craft and related trades workers
PMOA	Plant and machine operators and assemblers
EO	Elementary occupations
NIC	National Industrial Classification
NCO	National Occupational Classification
MLI	Modified Lilien Index

ESC	Effective Structural Change
NAV	Norms of Absolute Values
NILM	New Economics of Labour Migration

Chapter 1

Introduction: Bihar's Growth Question

1.1 Contextual Setting

Economic growth and development is one of the most important indicators of people's well-being and raise in the living standard. Economic growth is vital for development in poor countries, and sustaining the economic growth is a major challenge. Heterodox scholarship, in literature, has engaged with question of late comers into development¹. They underlined the distinction between the concepts of development from economic growth. Classical scholars used the terms progress and development as synonyms of economic growth. However, over time, from Classical to modern schools of thought, the meaning and definition of development have been changing. Meanwhile, several schools of economic thought and numerous theories of growth and development explained the development process in time. While from classical to neo-classical, and from Marxian to Keynesian, from micro to macro, all of the theories explain various aspects of development.

However, structural change has always been at the heart of such discourse on economic development. Since, it is always the case that the more productive sectors led economic development and growth, they variably cause a change in the composition of growth and development, which we often refer it to as structural change. In other words, growth and structural change occur together and can even be considered to be the two sides of the same coin. Structural change and economic growth are hence are the integral parts of development. There are three basic characteristics of structural change: a) it is universal as per the law of change, b) it could be planned or unplanned, and c) it could be negative or positive. While considering structural change and economic growth, it has a two-way relationship. It means that economic growth can happen only when the structure of an economy changes. This phenomenon can be viewed from either below or above. From the below, the changes in the social relations, labour structure, market functioning, institutions, resource allocation, and distribution could lead to economic growth. From the above, rise in capital formation, savings, consumption, effective demand and growth

¹ Ragnar Nurkse, Arthur Lewis, Rosenstein-Rodan, Hirschman, Gerschenkron, Paul Baran, Gunnar Myrdal et al are those contributed important ideas on growth and development of the poor countries, are often referred as Heterodox literature, as opposed to orthodox literature in mainstream economics [see Kant, Rajni (1997) *Paradigms in Economic Development*, Rawat Publication, New Delhi]

constitute the phenomenon, resulting from the changes in the structure. Therefore, this is imperative to understand the duality of process of structural change and economic growth in the process of economic development.

1.2 The Epistemology of Structural Change

The evolution of today's economy in the twenty-first century is the result of the continuous structural change in the different institutions of the world economy. This structural change is inevitable and thus passes through many development processes. The structural change consists of two-term, first 'structure' and second 'change'. For a basic understanding of structural change, the knowledge of *structure* and *change* is needed. The origin and etymology of structure are Middle English and taken from Latin word *structura*, from *structus*, past participle of *struere*. Kuznets defined Structure as "a relatively coherent framework of interrelated parts, each with a distinctive role but harnessed to a set of common goals" (Kuznets, 1959, p. 162). In concise form, Structure is a systematic framework of interrelated elements. While the systematic framework stands for an organized and arranged system with definite shape and size in a given perspective. Therefore, such an arrangement and organization of the constituent parts of an interrelated element or system within a given boundary that forms a definite shape and size is called Structure. Considering the universe as an entity, the universe's structure is an anthology of the various system of its components and every component of the universe has its own structure. From quarks, leptons, neutrons, electrons, protons, atoms, cells, molecules to living and non-living creatures, all of them have a definite structure

On the other hand, '*change*' is termed as an increase or decrease in the given entity within two times. It is perceived as a short-run phenomenon, and in the long run, the term transformation is widely used as an anthology of change. Therefore, structural change is termed as a change in the structure of an entity in a given time, while Syrquin (1988) defined structural transformation as "the inter-related process of structural change that accompany economic development are jointly referred as the structural transformation". The origin of the term transformation is also from Late Middle English: from Old French, or from Late Latin *transformatio(n-)*, from the verb *transformare*. Transformation can occur gradually and fast depending on the nature of the structure, whether it is Natural or Artificial. As stated above, the transformation in natural structure takes millions of years as it is evident Diamond is the transformed form of coal.

In the process of development, the initial structure of the kind transforms into another structure that is again liable for transformation and goes on in a process. The artificial structure takes relatively less time for transformation in accord with the advancement of knowledge, technology, and the availability of resources. If we compare the structure of the construction of the buildings or ships in a general sense, the material things of the ancient to medieval and to the present lots of transformation has evident. In biological terminology, the evolution of the human being is a great transformation from an animal due to changes in genes and DNA. So, the structural change or transformation in the Natural and Artificial structure is a process at the advent of growth and development across time. Therefore, structural changes in the natural forces are beyond human control. At the same time, planned and effective efforts could lead to the desired structural change or transformation, which are under the ambit of a human being. In economics, structural change or transformation concerns the process of economic development in terms of social and economic relations given the factors of production. Within this periphery, we have many constructs such as –social relations, national income, employment, unemployment, Migration, poverty, inequality, institutions, market, demography, developed and underdeveloped economies etc. Hence, in economics, we discuss structural change or transformation in an around these terms.

1.3 Structural Change and Development: A Literature Review

1.3.1 Historical Process of Structural Change and Development

Historically, classical economists can be perceived as the pioneers of the development theories and structural change analysis in the periods of 1700s to 1800. The works of Adam Smith, Karl Marx and David Ricardo are among the most cited studies among the classical economists². On the other hand, Schumpeter has also been the visited in the recent works shows an explicit link between late to the early works of the authors in the context of structural change analysis. For example, [Adam Smith \(1776\)](#) in his book '*An inquiry into the Nature and causes of the wealth of nations*' highlighted the role of labour and productivity growth in the progress of the wealth of the nations. The division of labour were identified as the main stimulus to the change in the economy which comes with labour specialisation. A higher division of labour across the jobs improves the technical skill of the workforce and enhance the labour power. Further, [Smith \(1776\)](#) classified a society into three parts – a) capitalists, b) landlords and c) workers and the profits, rents and wages respectively are the main sources of the income. The interrelations among the three basis classes of the society and

² Adam Smith has identified the structure of the modern capitalist economies, Ricardo had cleared certain conceptual inconsistencies, Marx identified the crucial internal and external contradictions that enable and limit the growth potential. These are more generic that include economies in the nascent stages of development.

the process of income distributions plays a crucial role in the Smith's theory of economic growth. On the other hand, the dynamics and relationship among the factors of production (land, labour and capital) constitutes an essential parts of Smith's theory of capital accumulations. Therefore, smith explicitly identified the labour value through specialization in the production process and capital accumulation through profit in the economic progress and changes in the economy.

In contrary to smith, [Ricardo \(1817\)](#) concerned more on the utilization of the capital accumulations and the distribution of the surplus between rent and profits which comes from the landowners and capitalists respectively. He further emphasised on the role of the population growth and the utilization of land into cultivation in the growth process. Land being an important factors of production are 'not unlimited in quantity and uniform in quality', therefore, it has critical implication on the decline in the rent share and thus profits. Hence, a continuous substitution of the produced to the non-produced inputs is important to sustain the growth of overall productivity and economic growth. This implies a changes in the composition of the productive system and changes in the income distribution is key to growth ([Silva & Teixeira, 2008](#)). In addition, A French economist [Quesnay \(1894\)](#) of Physiocratic school had analysed the analytical structure of the economy and explained the interdependence between the sectors. He pointed out the surplus generation process among three social class – a) cultivator: also known a productive class, b) sterile class: they are producer of the manufactured goods and c) idle class: these are the landlords who consume the surplus generated by the productive class. Quesnay was the first author who firstly presented an explicit analytical explanations of the growth process in contrary to a descriptive approach adopted by the early classical economists ([Silva & Teixeira, 2008](#)).

[Marx \(1985\)](#) has also put forward an explicit analytical explanations of the social structure and the reproduction of capital in the process of economic development in a more rigorous and nuanced way. The division of the capital into 'constant' and 'variable' capital follows a definite patters and explains the growth process with an increase in the ratio of constant to variable capital (known as organic composition of capital). He further explained the economic system through its two schemes of simple reproduction and extended reproduction or accumulation in a two sector model – a) consumer goods sector and b) capital goods sectors. The term 'structure' has not been specifically used in the earlier development theories, however, the changes in the patterns of the factors of production and its interaction had been taken as an essential tools while analysing the progress of the nations ([Steuart, 1767](#); [Smith, 1776](#)). The early classical and political economists (such as: Adam Smith, Thomas Malthus, Karl Marx, Thorstein Veblen etc.) were the first who used the historical data into their analysis to understand the development process and their inter-

relations among socio-economic factors. Such analysis helped in several ways to understand the causes, consequences and the process of the historical phenomenon occurred world-wide, i.e. – The French revolution, the empathy for the working class after that industrial revolution in England and subsequent capitalist development etc.

Much later to the Marxian analysis of development theory from political economy perspectives, the ‘stages approach’ of economic development described the linear and historical progress of the society into five stages of economic development such as primitive communism, slave society, feudalism, capitalism and socialism. On the contrary, Rostow analysed several pre-conditions and structural change in every stage leads to the shifts into the stages of growth (Rostow, 1960). This theory can be understood as an alternative to the historical materialism theory of Marx (Nafziger, 2006). However, Gershenkron (1962) criticised the linear stages approach such that a developed and underdeveloped states can have different structural constraints and there is no unique path of development. Meanwhile, in contrary to aggregate growth theory, the dual economy model proposed by Lewis (1954), further developed by Reni and Fei, (1961, 1963), Jorgenson (1961) has important contribution to understand the development process and structural change in an underdeveloped economy. The dual economy model assumes unlimited supply of labour with zero marginal productivity in the agriculture sector. The movement of the surplus labour in the capitalist sector enables capital accumulation. However, Sanyal (2014) argued that post-colonial capitalist development in poor countries do not absorb surplus labour leads to informal sector or non-capitalist sector to get subjected to constant primitive accumulation. Nevertheless, industrialisation, capital formation/accumulation and technological advances played an important role in the development process (Rodan, 1943). The ‘Big-push’ theory of Rosenstein-Rodan (1961) and ‘balanced and unbalanced’ development theory of Nurkse (1956) Hirschman (1958) laid emphasis on the capital accumulation through minimal initial investment as a Big-push to the economy and bridging the gap between sectoral difference for balanced growth (Silva & Teixeira, 2008).

Moreover, Andre Gunder Frank (1967), a Structuralist dependency theorist stated that “Underdevelopment is not just the lack of development. Before there was development there was no underdevelopment”. His development model states that the reason behind the development of the developed nations in colonial period due to the exploitation of surplus labour of the underdeveloped economy and thus making them underdeveloped. This is the process through with a county gained on the cost of others. That’s why model is development of underdevelopment in a core and periphery relation work for the development of the one on the basis of the other.

[Ernesto Laclau \(2012\)](#) has criticized the term underdevelopment and dual economy in the backward economy. Laclau argues that Gunder-Frank makes the mistake of categorizing the mode of production in the periphery as capitalist. He is unable to differentiate between a mode of production and an economic system.

1.3.2 Recent Empirical Studies on Structural Change: Three Sector

Hypothesis

One sector exogenous growth models ([Keynes, 1937](#); [Harrod, 1939, 1948](#); [Domar, 1946, 1947](#)) emerged after the great depression of 1930s and the subsequent World War II had largely focused unanimously on the full capacity of utilization of resources and full employment in the economy taking investment and saving as an important determinants of equilibrium growth rate ([Gabardo et al., 2017](#)). Further, the growth theories introduced the role of capital, labour, embodied technical progress (as exogenous variable), permanent income and life-cycle saving hypothesis into account ([Solow, 1956, 1959](#); [Cass, 1965](#); [Koopmans, 1965](#); [Ramsey, 1928](#)). In addition, [Arrow \(1962\)](#) attempt to endogenize technical process into his model using ‘learning by doing’ through innovation and research and development mechanism and commonly known as AK model. The AK model was further extended by [Romar \(1986, 1987, 1990\)](#) and [Lucas \(1988\)](#). In another endogenous growth model, [Schumpeter \(1942\)](#) stressed on innovation as a driving force of economic growth which arises out of technological competition among the firms. Similarly, [Hicks \(1965\)](#) develops a two sector growth model, where labour and technology are used in the production process with fixed technical coefficients of production for each sector.

In Kuznets view “Growth is a sustained increase in the magnitude of a unit, necessarily accompanied by changes in magnitude of the component interdependent parts and often attended by shifts in their relative magnitude or the emergence of new parts and lines of organization” ([Kuznets, 1959](#)). In further analysis of structure and growth of the nation, Kuznets emphasis the role of the historical past of the nation in the understanding of the structure and growth patterns. In this regard, a comparative study of economic growth and the structure of the nation helps to identify the fundamental, different pattern of antecedent growth and identical factors responsible for growth. In his general model of the comparative study of three factors is useful, in form of transnational, national and international factors. Within transnational three complexes has shown. A) the industrial system b) the community of human wants and aspirations and c) organization of the word into nation-states, each with apparently impenetrable unoverridable sovereignty. The economic structure of the nations observed on the basis of its “population, labour forces, natural resources, capital supplies, total product and its various components, the set of institutions that

governs its economic activity and so on, including exports and imports and other aspects of relations with the rest of the world”.

The search for uniform patterns in the relationship between long-term economic development and changes in the economic structure using both cross-section and time series data was also actively pursued by Hollis Chenery, on his own and in collaboration with other authors (e.g., [Chenery, 1960](#); [Chenery and Taylor, 1968](#); [Chenery and Syrquin, 1975](#)). [Chenery and Syrquin \(1975\)](#) identified three basic processes of structural change through which economic process can be tracked – a) Accumulation process, b) Resource allocation process, and c) demographic and distribution process. Further, [Chenery and Taylor \(1968\)](#), for example, identify three distinct clusters of economies – large, small primary-oriented and small industry-oriented – relying on an extensive comparison of post-war changes in several countries and using a vast array of econometrical tests. In a later work, [Chenery and Syrquin \(1975\)](#) extend the search for uniformities, broadening the number of structural variables and applying regression analysis to a very large sample of countries. From this exercise, they derive ‘stylized facts’ of development, and establish a typology of developing countries that takes into account resource endowments and differences in development strategies pursued. A common feature of these studies is the use of a rigorous statistical framework in the search of regularities from which an endogenous determination of structural classification schemes and an identification of general patterns of economic development can be derived.

On the other hand, [McMillan, Rodrik & Sepulveda \(2017\)](#) argued that through accelerating the economic factors or fundamentals such as –human capital, technology, institutions, investments in infrastructure, and industries could lead to economic growth, and then structural changes happen. Further, they assert that there are three different corridors of structural change assuming economic growth leads to structural change – a) slower growth - slower structural change, b) faster economic growth – faster structural change, and c) episodic economic growth – episodic structural change. [Hasan et, al., \(2013\)](#) also put that “Sates with the better developed financial system, more competitive product markets, and greater labour market flexibility experience faster structural changes”. Therefore the essence of the fact is that that there is a close direct relationship between structural change and economic growth vis-à-vis. Some other studies also focus on the nature and the relationship between structural changes and economic growth for Asian, European, and African economies ([McMillan et al. 2017](#); [Foster– McGregor & Verspagen 2016](#); [Vu 2017](#); [Busse, Erdogan, & Muhlen 2019](#); [Chenery & Elkington, 1979](#); [Syrquin, 1988](#)).

Among the most recent studies on structural change analysis, [Silva & Teixeira \(2008\)](#) found that convergence and growth has been the relevant category of analysis throughout the periods, however, there was a marked increase in the discussion in the context of “productivity growth” and “technical change and innovation” in the structural change analysis in the recent years. Another strands of literature is concerned with an empirical analysis on the aggregate productivity growth differentials due to the effects of the reallocation of the production factors among industries. These empirical studies were frequently appearing during 1990s which use an alternative productivity decomposition using weighted-share approach of the production factors ([Dunne et al., 1988, 1989](#); [Disney et al., 2003](#); [Baily et al., 1992, 1996, 2001](#); [Caves, 1998](#); [Foster et al., 1998](#)). The decomposition approach by [Baily et al., \(1996\)](#) splits productivity change into three terms based on the share-weighted average productivity level of the share of the industries i in total employment or value added in period t and $t+1$. The first term were interpreted as the within effect (contribution of technology) and rest of the two terms combined denote structural change on aggregate productivity growth. Later, [Fegerberg \(2000\)](#) and [Pender \(2003\)](#) employ similar decomposition, however a different interpretation of the between industry effects. One of the most recent studies by [McMillan, Rodrik & Sepulveda \(2017\)](#) modified the decomposition method into only two terms – first, within effect and structural change effect. Similarly, [Vu, \(2017\)](#) has proposed effective structural change index using shift share method of productivity decomposition and norms of absolute values (NAV) index (explained in details in chapter 5).

In addition to the theoretical explanations and the relationship between development and structural change, the terms structural change in an economy has been argued in many ways in several recent literatures. [Hasan, Lamba, Gupta \(2013\)](#) explains that structural change is the change in the composition or construct of income and output which encompasses three processes - a) changes in the sectoral composition of output, b) changes in the sectoral composition of employment c) changes in the rural-urban composition of output and employment. In [Herrendorf et al., \(2014\)](#) view, this is the reallocation of the economic activities across the broad sectors such as agriculture, manufacturing, and services in the form of both income/output. While [Lin. et al. \(2019\)](#) identified five main features of structural change – “a) steady declining share of agriculture in economic output and employment, b) rise in the share of urban economic activities in industry and modern services, c) an increasing sophisticated share of manufacturing goods in production and exports, d) migration of rural workers to urban settings and e) demographic transition that typically involves a spurt in population growth before reaching a new equilibrium”. In short, the composition of income and movement of the labour force is the central point of structural change.

In a traditional economy, the mechanisation of labour-power and changes in the labour relations in the agricultural sector is at the centre of economic growth. In contrast, economic progress is mostly driven by capital accumulation and technological support in the modern economy, from supply-side, given the organizational structure and institutional mechanisms. The agriculture sector has a very limited capacity to grow due to fixed production factors such as – land, which is inelastic in supply, while demand elasticity tend to be low. On the other hand, non-agriculture sectors have enormous scope to use capital and technology with the human effort to push growth and higher demand elasticity of income (Aggarwal & Kumar, 2015). Labour movement plays a central role in this process, where labour reallocates from the low productive sectors (traditional sectors) to the relatively higher productive sectors (modern sectors) in the development process. As we have discussed earlier, several growth and development theories explained this process in terms of labour mobility across the sectors (Lewis, 1954; Ranis & Fei, 1961; Fisher, 1939; Clark, 1940). Therefore, considering three broad sectors, labour reallocation occurs in two ways a) across the sectors, and b) within the sectors. The factors behind such reallocation are the productivity differentials either across or within the sectors. Therefore, in this thesis, the labour force dynamics is the main unit of analysis in the process of structural change and economic growth in Bihar in the realm of three sector hypothesis. In addition, the movement of labour force from rural to urban has been taken as the migration of the labour out of the state. As we propose, out migration has an important role in determining economic growth and raising the living standard of the households.

1.4 The State of Bihar: An Introduction

Bihar is one of the Indian states located in the eastern part of India and is completely surrounded by land. It is surrounded by West Bengal in the east and Uttar Pradesh in the west, while the boundaries of Nepal fall in the northern, and Jharkhand in the southern part of Bihar. River Ganga, which flows from the west to the east, divides the Bihar plain into two unequal parts popularised as north Bihar and south Bihar. It was formed on 12th March 1912 after the Bengal precedence, and later Odisha was separated in 1935, while a further bifurcation of Bihar created Jharkhand in 2000. It is the third most populous state in India and covers an area of 94,163 km² to form India's twelfth largest by area and a population density of 1106/km². More than eighty-five percent population lives in the rural region at 921 sex ratio in 2011. The decadal population growth rate has declined between 2001 and 2011; nonetheless, the growth rate was much higher than the national average of 17.7 percent. Table 1.1 presents a detailed account of the demographic profile of Bihar in 2011 and 2001.

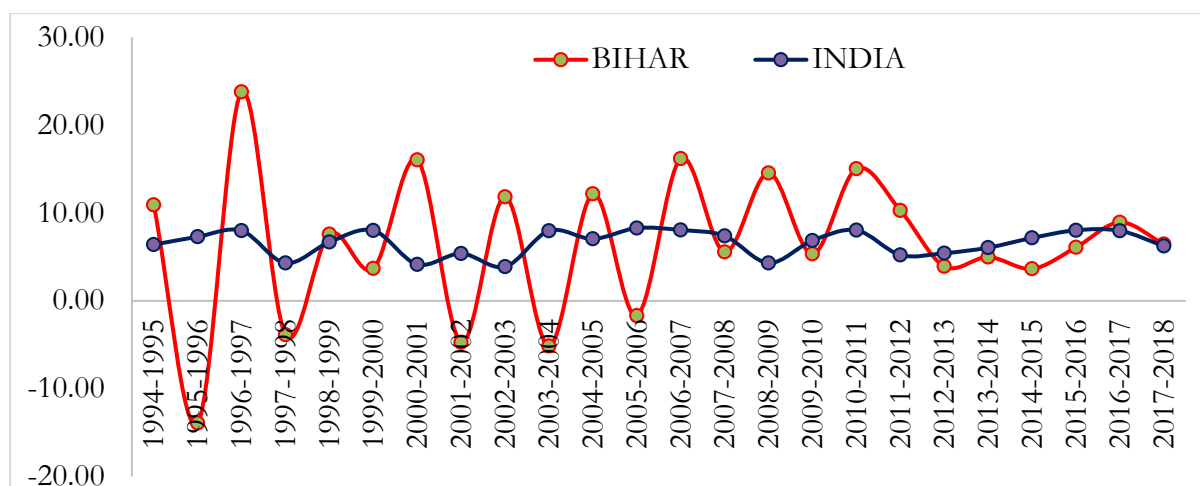
Table 1.1 Demography of Bihar

Descriptions	2011			2001		
	Total	Rural	Urban	Total	Rural	Urban
Population	10.41 Cr.	9.23 Cr.	1.17Cr.	8.30 Cr.	7.43 Cr.	.87 Cr.
Male	5.42 Cr.	4.80 Cr.	6.20 Cr.	4.32 Cr.	3.86 Cr.	.47 Cr.
Female	4.99 Cr.	4.42 Cr.	5.56 Cr.	3.97 Cr.	3.57 Cr.	.40 Cr.
Total Population Growth	25.42%	24.25%	35.43%	28.43%	33.63%	-3.44%
Percentage of Indian Population	8.60%	11.08 %	3.10%	8.07%	10.00%	3.04%
Sex Ratio	918	921	895	919	868	926
Child Sex Ratio	935	938	912	942	924	944
Literacy Rate	61.8%	59.78%	76.86%	47.50%	43.9%	71.9%
Male Literacy Rate	71.2%	69.67%	82.56%	60.3%	57.1%	79.9%
Female Literacy Rate	51.5%	44.30%	61.95%	33.6%	29.6%	62.6%

Source: Census of India, 2011. Note: Cr. = Crores

Bihar stagnated under permanent settlement and colonial mode of production. Post-independent period saw failure of land reform and Zamindari abolition on the ground. These factors often thought to have placed ‘built-in depression’ on the growth process (Das, A (1987); Pradhan Prasad (1984). The rent seeking feudal extraction has resulted in extreme poverty and backwardness. The state is also captured by the intermediary classes, which neglected education, health, and infrastructure, which made a vicious circle of poverty. In addition, the economic status of Bihar declined after the Indian independence for a long time during 1950-2000. In a comprehensive study on the reasons for Bihar’s backwardness in the historical perspective, [Mukherji and Mukherji \(2012\)](#) identified five historical factors of Bihar’s backwardness in the late colonial and early independence periods, such as – a) an exploitative agrarian system, b) an unfair freight equalisation policy, c) Negligence of central as well as state institutions, d) low credit to debt ratio in Bihar, and e) caste and class struggle. Further, [Ghosh and Gupta \(2010\)](#) stated that Bihar had failed to channelise the benefits of LPG – liberalisation, privatisation, and globalisation policy of the central government in 1991. Bihar had the lowest and declining growth rate among the states of India in contrast to the increasing growth rate at the India level.

Figure 1.1 A comparative growth rate between Bihar and India



Source: Author's estimation using RBI database

Table 1.2 Growth rate of income and per capita income of major states

Sl. No.	States/Periods	GSDP			Per Capita GSDP		
		1993-94/ 2005-06	2006-07/ 2011-12	2012-13/ 2017-18	1993-94/ 2005-06	2006-07/ 2011-12	2012-13/ 2017-18
1	Andhra Pradesh	5.88(13)	7.05(15)	9.34(3)	9.38(1)	6.28(14)	8.70(2)
2	Bihar	4.20(19)	10.07(3)	6.00(16)	1.84(20)	7.10(3)	4.07(17)
3	Chhattisgarh	4.06(20)	7.32(13)	5.40(19)	2.35(17)	5.07(19)	3.73(20)
4	Delhi	7.92(2)	8.93(6)	8.38(6)	4.65(11)	6.79(7)	6.17(10)
5	Goa	7.18(3)	12.45(2)	8.79(5)	5.43(4)	13.24(1)	8.04(4)
6	Gujarat	8.00(1)	9.12(5)	9.74(2)	5.96(2)	7.10(4)	8.07(3)
7	Haryana	7.11(4)	8.74(7)	9.01(4)	4.66(10)	6.99(5)	7.49(6)
8	Himachal Pradesh	6.96(5)	8.03(11)	7.29(10)	5.42(5)	6.74(8)	6.48(8)
9	Jammu And Kashmir	4.74(15)	6.13(21)	5.65(18)	2.51(16)	3.27(21)	4.06(18)
10	Jharkhand	3.91(21)	9.56(4)	5.22(20)	1.79(21)	6.99(6)	3.57(21)
11	Karnataka	6.50(7)	6.89(17)	10.17(1)	4.99(7)	5.15(17)	8.98(1)
12	Kerala	6.33(11)	7.24(14)	6.07(15)	5.58(3)	6.72(9)	5.56(13)
13	Madhya Pradesh	4.35(18)	8.28(10)	7.01(13)	2.23(18)	6.37(11)	5.36(14)
14	Maharashtra	6.3(12)	7.72(12)	7.22(12)	4.37(12)	6.28(13)	6.10(11)
15	Odisha	5.21(14)	7.02(16)	8.19(7)	3.77(14)	5.68(16)	7.65(5)
16	Punjab	4.51(16)	6.84(19)	5.97(17)	2.63(15)	6.09(15)	4.60(16)
17	Rajasthan	6.45(8)	8.69(8)	6.86(14)	4.02(13)	6.68(10)	5.34(15)
18	Tamil Nadu	6.37(10)	8.54(9)	7.29(11)	5.32(6)	6.36(12)	6.64(7)
19	Uttar Pradesh	4.44(17)	6.86(18)	7.33(9)	2.19(19)	5.08(18)	5.71(12)
20	Uttarakhand	6.71(6)	13.59(1)	7.89(8)	4.84(9)	11.60(2)	6.45(9)
21	West Bengal	6.41(9)	6.23(20)	5.09(21)	4.92(8)	4.79(20)	4.05(19)
22	INDIA	6.43	6.35	7.08	4.52	4.68	6.04

Source: Authors Calculations. Note: Ranks are shown in the brackets.

Bihar, along with Uttar Pradesh, West Bengal experienced accelerated population growth rate during (1951- 2011). Low capital formation, faster population growth led to slower per capital income, higher poverty and unemployment. In the post liberalisation period, Bihar's growth rate was below the national average of 4.2 percent during 1993-05, accelerated to 10.07 percent during 2006-12. Further it fall to 6.00 percent during 2012-18 back below the national average. Specifically, an average growth rate was 4.01 percentage points lower during 2001-02 to 2005-06 compared to the period of 1993-94 to 1999-00. Later, almost after fifteen years of the LPG policy, Bihar has shown a significant growth acceleration between 2006-07 and 2011-12. In this phase, the average growth rate in Bihar was much higher than the national average. Additionally, there was a negative growth rate for at least five years in post liberalisation until 2005-06 compared to Bihar's own growth performance of the later years (figure 1.1). In the growth acceleration phase, not even for a single period, the growth rate was negative. A decent and stable growth rate is an important determinant of an improved standard of living, prosperity, and development of a state.

The importance of decent and steady growth could be understood as that if a continuous growth rate of 7 percent per annum would double the state income in just 10 years, whereas a growth rate of 5 percent per annum would take 15 years in doubling the income (Bhattacharya & Kwatra, 2020). Hence, the growth rate matters to achieve faster economic development and structural change. It was indeed a remarkable achievement adhered to by the state in the process of economic growth. However, Bihar was *not* the only state that has performed such growth rates. Other low-income states – Jharkhand, Uttarakhand, and Odisha - also marked a decent growth and even higher than the national average over 2006-07 to 2011-12 (Aiyar, 2010). The examination for the further growth phase of 2012-13 to 2017-18, in Bihar, showed a sudden decline in the momentous growth rate achieved during the previous period (table 1.2). Further, the per capita income of Bihar has the lowest growth rate than the overall income of the State, and the rank also declined in the last period. Therefore, despite a commendable increase in the state income, the per capita income has not improved much, probably due to high population growth in the last decade.

1.5 Research Gap and Significance of the Study

The available literatures on structural change and economic growth analysis has focused mostly in the context of Indian economy. Pradhan H. Prasad, Arvind Narayan Das and Jagannath Mishra have several scholarly contributions about the changes in the Bihar economy since independence till late 1990s with the collaboration with Anugrah Narayan Sinha Institute of Social Sciences

(ANSISS)³ in Patna. (Prasad, 1973, 1974, 1979, 1988, 1996; Das, 1975, 1976, 1979, 1992; Mishra, 1974, 1977, 1984). A large set of studies from political economy framework are conducted during 1973 and late 90s on the agrarian relations, class and caste struggles, mode of production and regional imbalances in Bihar. Later strand of researchers (such as – Alakh Narayan Sharma, Gerry Rodger, Jean Dreaz, and many more) associated with the Indian Institute of Human development (IHD)⁴ has focused upon the employment, migration and dynamics of labour market (Sharma, 1995, 2005, 2006; Sharma & Rodger, 2015). Since there is little data on migration of labour, these studies carried out primary surveys. During late 2010s, a sudden increase in the growth rate of the Bihar economy has attracted several known scholars to investigate the growth performance.

We assert that a good deal of literature on Bihar has studied the backwardness and its factors, not many have looked into the hidden changes that began happening in the structure of Bihar economy and its consequent acceleration in growth. Such a growth transformation is also a recent phenomenon which needs to be studied and analysed. This study brings the economic change in the post-liberalisation periods. Secondly, the recent studies took a very limited time period of analyses while reporting the sources and the factors of growth in Bihar (Gupta, 2010; Nagraj & Rahman, 2010; Singh & Stern, 2013; Mukherji & Mukherji, 2012). Therefore, our study would add value to the existing literatures in a way that we have include around two and a half decade time period into our analysis starting from 1993-94 to 2017-18. In best of our knowledge, this is the first study on Bihar which has used six rounds of national sample survey data and an empirical investigation into analysis to understand the growth process and structural changes analysis at the sectoral level. Another significance of our study is that the data analysed in the chapters belonging to the Bihar state only for the periods before bifurcation of Bihar and Jharkhand.

The purported growth turnaround of Bihar in the recent decade can be understood and explained in several ways. Three broad perspectives of structural change in the economy can be considered such as – a) political, b) social, and c) economical. This study implicitly assume some certain political economy as background in which development occurs. We investigate the causal explanatory factors of Bihar's economic growth and structural change empirically. Further, the

³ ANSISS was established in Patna on January 31, 1958 by the contemporary President of India Dr. Rajendra Prasad. The institute was established to collaborate several research studies with national and international institutes by undertaking various meaning projects relating to the socio-economic development Bihar. It has to organise seminars and workshops to educate the stakeholders of the State and the county as well.

⁴ IHD was established in 1998 and has been continuously working on several projects related to the Bihar economy through the primary survey known as Indian Human Development survey (IHDS).

study analysed the pace of structural change over the years from a socio-economic perspective based on the available secondary data to understand the growth turnaround.

1.6 The Research Problem

Bihar experienced considerable acceleration in growth in the past two decades. There are several development challenges. After independence, some states have grown at a faster rate, became industrialized, provided employment such as in Tamil Nadu, Andhra Pradesh, Gujarat, Maharashtra, etc. whereas some states contributed more in Agriculture sector, i.e., Punjab, Haryana, West Bengal, Andhra Pradesh, etc. But, the research question arise for Bihar is that, why its growth has not paralleled with other states? Why the Structural change in the economy is so slow? Why economy remained backward? What are the historical, institutional or political reasons for its Backwardness? What are the political economy of conflicting forces and interests? What are the determinants of the backwardness and the way out? How are the various socio-economic factor interlinked in the growth process? Has the nature of occupation been diversified and how it generating impulse in the economic growth? What are the productive sectors for employment generation? How has the migration and remittances benefiting to the migrant households? These are some of the questions that we would be looking into the thesis.

It is cardinal to state that growth emerges from the capital formation. However, the growth process has a structure and performance factor. A structure has a history, path dependence and a constrained agency. Institutional reforms could play a major role in easing the conditions by containing the forces that inhibit accumulation. An agrarian-dominated structure, as all traditional economies are characterized, needs institutional, technological, and market reforms. Feudal forces need to be reined in to enable free labour from semi-feudal relations, human capital and infrastructure need to be provided, and sagacious fiscal policy needs to be followed for eventual structural change. Migration of capital and labour would aid this process. The problems of growth and structural change are three fold. Firstly, to find out what factors can loosen the semi-feudal relations in the country-side of Bihar, so that changing production relations leads to productive investments, improves rural incomes and livelihood. Second problem is what policy variables would move the sluggish growth in Bihar's economy. Third, what is the challenge of structural change of Bihar that can constrain its growth?

1.7 Objectives of the Study

The main objective of this thesis is to understand and analyse the role of labour in the process of economic growth and development in Bihar. It further investigates the structural change in income and the evolving nature of employment in the labour market, and its impact on the economic growth and development of the state. The study periods of the analytical investigation ranges from 1993-94 to 2017-18. Within the framework of this broad objective, the specific objectives set out for the study are as under:

- 1) To understand the factors of Bihar's backwardness in the process of economic development historically and the changes in socio-economic structure in the post-liberalisation period from political economy perspective.
- 2) To understand the trends and patterns of the economic growth during 1993-94 to 2017-18 in Bihar and to explore the sources of economic growth and structural change in income at the sectoral level.
- 3) To analyse the employment dynamics in the labour market and the determinants of the declining labour force in Bihar along with the changes in the demographic structure and the activity status in the labour market over the period of 1993-94 to 2017-18.
- 4) To analyse the dynamics of the employment status and occupational structure in the labour market along with the role of productivity growth and structural change in the economic growth of Bihar.
- 5) To analyse the role of migration and remittances on the well-being of the households in Bihar.

1.8 Hypothesis

Based on the research problem and objective of my thesis, the major hypothesis of the study are as following:

- a) Bihar has witnessed construction-led growth in the growth phase.
- b) The socio-economic factors (gender, age, social-group, religion, income, etc.) have a significant impact in determining the activity status of an individual.
- c) Decline in female labour force participation has significant role in the decline in overall worker participation rate in Bihar.

- d) Changes in the occupational structure has raised the labour productivity and economic growth in Bihar.
- e) Endogenous factors of like technological growth and capital accumulation/ formation are the major drivers of labour productivity and economic growth in Bihar.
- f) There is a positive relationship between remittances and standard of living of the households in Bihar.

1.9 Data and Methodology

To meet the objectives of the study, the thesis relied completely upon the secondary data sources. Specifically, the study used various macro-economic data from the database on the Indian economy, Reserve bank of India, Directorate of economics and statistics, government of Bihar, yearly reports on economic survey published by government of India as well Bihar, Database of NTI Aayog and data.gov.in. In addition, the major chapters of the thesis used unit level household survey data on the labour force survey conducted by National Sample Survey, Ministry of Statistics and programme implementations, Government of India. The thesis involved five rounds of employment and unemployed survey starting form 1993-94 to 2017-18 and 64th NSS round of employment & unemployment and migration survey, 2007-08. In addition to NSS data, database on migration particulars collected by Census 2001 and 2011 has also been utilised. The thesis used basis statistical tools and econometrics models to substantiate the objectives of the thesis along with the cross-tabulations, graphs and figures. The detailed explanation of the data sources, variables and methodologies have been explicitly explained in each and every chapters for more clarity.

1.10 Outline of the Thesis

This thesis is divided into seven chapters apart from the *introduction* chapter. Out of eight chapters, six prime chapters are to meet the various aforesaid objectives of the study – chapter 2 to chapter 7. Chapter 2 presents a holistic understanding of the historical backwardness and the morphology of economic growth in Bihar from political economy perspective. Chapter 3 presents a detailed disaggregated analysis of the growth performance in Bihar from 1993-94 to 2017-18 and analysed the macro-economic determinants of economic growth. Chapter 4 delves into the trends and patterns of employment over the study periods along with the activity status (in terms of economic and non-economic activities) of an individual. This chapter provides a broader sense of the activity status in the population structure and also answers the factors of the declining labour force in Bihar.

The structural changes in the labour force composition across various identified industrial sectors and changes in the occupational structure have been done in Chapter 5. Chapter 6 takes into account both employment and income variable to analysing the role of capital accumulation and structural change in the growth of labour productivity at the sectoral level. The role of migration and remittances in raising the standard of living of the households has been identified in Chapter 7. Lastly, the summary and conclusion are presented in Chapter 8.

1.11 Limitations of the Study

Each and every study has certain limitations that should be recognised to get a nuanced understanding of the methodologies used and the framework followed in the study. This study also has certain limitations, which has been discussed below:

- a) The methodology of growth and productivity decomposition used has its limitations as if the number of sectors increases the values of the results would change. However, it can be still taken into consideration if it is used to compare at the same scale and level.
- b) The unavailability of time series data on the labour market estimates refrains us to undertake any time series regression models and that is why the study is based on the secondary data. However, sometimes the estimates of NSSO survey differs from the ground realities. The primary survey could have been performed for much nuanced understanding, nevertheless it was intended to do however couldn't be accomplished due to the sever lockdown and chaos of the COVID-19 pandemic.
- c) The empirical estimation presented in the study is particularly based on the households' survey and lacks the study on the macroeconomic aggregates (such as sector-wise capital formation, savings etc.). This is because unavailability of the desired variables to carry out the analysis, therefore, a residual approach for productivity decomposition as an alternative methods has been applied to perform structural change analysis.
- d) The methodology used in the NSSO survey in the Periodic Labour force survey is different than the earlier NSSO surveys know as employment and unemployment surveys. However, the both of the survey are used as if it is the best available labour force survey and also it was recommended by the MOPSI and can be used for comparisons.

Chapter 2

Breaking Out of Shackles of Backwardness

2.1 Introduction

Bihar is one of the poorest state of India. This has been so, at least since Independence. However, there are worse and better phases of growth, within the broad time period, mentioned here, as well. Particularly, the recent growth experience in Bihar has brought the role of governance and the stimulating factors of economic growth into the focus. The turnaround is interesting because of continuity in the moribund economy in the 1990s. The economic structure, and the growth were near-stagnation in the late 1990s. However, such stagnant structure has a history. The dynamics of caste, class, and institutions have a major role in keeping the capital accumulation stagnate. The transition from an agrarian economy to a modern economy needs removal of institutional, technological, and market constraints for the growth process. Historically, Bihar's stagnation can be traced to the colonial times. It is an imperative to look into the socio-economic and political structure of the economy in history to understand Bihar's present backwardness and its political economy of development. We trace the morphology of Bihar's sluggishness in a historical and evolutionary way.

The main objective of this chapter is to give an understanding of the factors of Bihar's backwardness in the process of economic development historically, and the changes in socio-economic structure in post-liberalisation period at the macro level. Specifically, there are two points of analysis as sub-objectives, first, to get a review of the historical factors for backwardness in Bihar during pre-liberalisation periods; and second, to analyse the changes in the socio-economic structure in the post-liberalisation period. Thus, the factors of backwardness and the morphology of development in Bihar are identified in an explorative way through contemporary studies in history and the empirical analysis performed in the previous chapters.

2.2 Bihar in the History

2.2.1 Pre-British Rule (Medieval Bihar)⁵

The vibrant and stunning history of Bihar started from Haryanka Dynasty, founded in 684 BC to Gupta Empire in 240 AD. In fact, the ancient history of Bihar was more or less associated with

⁵ Bihar had a glorious and rich history from ancient to medieval India. It is the birthplace of Buddhism and Jainism, where Lord Buddha attained enlightenment and Lord Mahavira was born. Guru Gobind Singh Ji, the tenth and last

the history of India, where the era of Mauryan Empire had ruled not over Bihar only but on dominions of India whose capital was Magadha (Thapar, 1966; Sarkar, 1988), from his capital Patliputra now called Patna. It wasn't easy to distinguish village and city area in those days, yet the city life was preferred. Most cities were developed near the Ganga River like BiharSharif, Patliputra, Bhagalpur, Monghyr etc⁶.

Historian Jadunath Sarkar (1978) elaborates that North Bihar and Gaya by the 10-11th centuries, were the most important places for Muslim settlements. Caste system defined division of labour in village. The Mithila region was the centre for agricultural production, where the upper castes (Vaisyas) used river water for agricultural activities. Lower castes do cultivation by using water from wells, tubes, and tanks. The Magadha region was rich in dairy, rice production, where opium, bhang, and spirits were highly cultivated and manufactured in Bihar and Malwa region. South Bihar (Present Jharkhand) was the biggest hub of Textile industries in Hindustan. Despite that, there were many small-scale home industries like spinning, weaving, metal work, jewellery, stone, wood, and brickwork. Bhagalpur was the manufacturing hub of *tasar*, a kind of coarse silk along with Mithila, especially Bhagalpur was famous for his Munga sari made up of Munga. Trade and commerce were spread over Europe, East Africa, Egypt, and some parts of Asia. At that period, the Slave trade was also extant (Sarkar, 1978).

Later, in the Mughal period, around 16th to mid-18th century, Bihar became the important supplier of sugar and saltpeter worldwide, especially to Europe. In this period, many European companies came to Bihar for trade and commerce i.e., the Portuguese, the Dutch, the French, and the east India Company. The Dutch were much interested in the trade of saltpeter and opium rather than cotton and silk goods. Where the East India Company came to India not for trade

guru in Sikhism, was born in Bihar. Patliputra (present Patna) was the capital of the Indian Territory during 7-8th century B.C. Bihar has played a significant role in Indian history, from the glorious past to the degradation in the colonial period. Sir John Houlton (1949) described the role of Bihar in the Indian continent beautifully and propounded the name of his book "Bihar: The Heart of India." Therefore, this section deals with a brief analysis of Bihar's history and its role in making the present Bihar.

⁶ Later, the Chaco Canyon civilization was considered as the golden period in history due to improved irrigation, canal, and infrastructural system (Rao, 2015). Upon the collapse of this civilization, Bihar's position goes much further back in time compared to Chaco Civilization. The Medieval Period (13th to mid-18th century) in the history of Bihar, as described by Jagadish. Narayan. Sarkar (1978) in his book "Glimpse of Medieval Bihar Economy" too had a rich and better civilization. As he described in his book, the rural agricultural areas were the backbone of the country's economy, and the rural sector was well developed and self-sufficient but stereotyped in the Sultanate Period (AD 13th to 15th Century).

only, but they tried to set up factories for production using the cheap labour forces and the raw materials (Thapar, 1966; Keay & Blethen 1995; Chaudhuri, 1978). They had established numerous factories in Surat, Ahmadabad, and other places in Gujarat and Agra. But they failed to establish important factories in Patna, though the first English factory was established in Patna in 1620 to purchase cheap and excellent local raw materials. The French had two main trade articles in Bihar that was Saltpeter & coarse calico cloths. Due to the high fertility of soils, especially in the Champaran Tarai region near rivers, low price food grains and high-quality crops were in Demand. Mines and Minerals i.e. Golds, Diamonds, Borax, Saltpeter, and Handicrafts, were the important commercial trade in Patna during the half of the eighteenth century. Bihar was considered as a centre of international and inland Trade. At the beginning of the 18th century, the English companies recorded the name of companies who handled the remittances of the English funds from Hugli to Patna in 1705 through hundi (bills of exchange). This was the period of rich merchants, many regarded as the incipient capitalist and private partnership firms. Manikchand Ramchand, Sadanand & Iulgee, Sukhdev & Sewdutta, Kishor Sahu, and Maneshwar Nath were the few large and rich merchants in Patna. The bills of exchanges were issued by the governor to the factories in the names of Shroffs (Sarkar, 1978, Rao, 2015).

2.2.2 The Colonial Rule

Medieval Bihar had seen a long course of Feudalism. Its imperceptible pace in changing nature could be understood that Sher Shah Suri was the first who initiated the land revenue reform measures followed by Akbar. Under British rule, Bihar had faced the worst kind of exploitation without benefiting the west. On one side, where Bihar had resource power in the medieval period, it started deteriorating in British rule. But at the same time, industrial development, the establishment of educational institutions, and scientific development were done in other parts of India such as - Gujarat, Madras, Bombay, and Calcutta. Under the impact of colonial trade, the textile industry of Bihar had declined. De-industrialization had broken the Bihar economy due to the collapse of small-scale industries and the commodification of agricultural products. The labour was shipped to British colonies like Mauritius, Fiji, the Caribbean island, and South Africa (Clarke, Peach & Vertovec, 1990; Saunders, 2018; Allen, 2017).

The Imposition of Permanent Settlement⁷ by Britishers in eastern India had a devastating effect on the rural people that drove them into deeper misery. However, Cornwallis's aim for the

⁷ Introduced in 1793 by Lord Cornwallis, under which the collectors of land revenue became the defacto owners of land, and land revenue was fixed as permanent amount.

permanent settlement was to end the uncertainty involved in the periodic settlement. Moreover, Zamindars will be allies of the Britishers, and they will get more profits by utilizing the resources in the lands. But the incompetent Zamindars not only became decadent but rendered people ruined debts. Zamindars were broken up (Gupta, 1982; Arvind Narayan Dash (1992). At the advent of the twentieth century, Bihar and Orissa were separated from the Bengal presidency, and Patna became the capital of Bihar. Sachchidanand Sinha was the founder of Bihar among the other then literate professionals like Rajendra Prasad – who had demanded the separation of Bihar from Bengal. The Britishers separated Bihar not only due to Bihari agitators but at that time, Bengal was facing the Swadeshi-protest, and the Britishers did not want the Bihar population also get affected by the militant nationalism (Sarkar, Bhattacharya, & Chakrabarty, 1973; Gupta, 1997). Though, even after the separation, the condition of Bihar had not improved because the middle class of Bihar was not much interested in industrial or manufacturing entrepreneurship. The state did not have any local powerful business community, not any particular caste has emerged as entrepreneurial (Dash, 1992). Zamindars, unlike in some parts too got used to lavish lifestyles and did not progress towards investing the prosperities into investment into transport or agro industries. Nor was there even a stock exchange and banking financial institutions in Bihar. More or less, the mode of production in Bihar during the British rule was semi-feudal and semi-capitalistic (Biswas, 2008, Chakraborty, 2017; Chandra, 1984). Pradhan Prasad (1988) states that the transfer of adequate resources from rich to poor states are important to bridge the gap between uneven regional growth in India, and also he indicated that even after the Indian Independence the uneven regional growth were continuing, where Bihar was the most disadvantaged state in terms of convergence of growth (Prasad, 1988).

2.2.3 Peasant Struggle and Caste Politics: Post-independence

Two decades prior to Independence, Bihar had witnessed several peasant struggles in the forefront. These struggles were highly active during the period of 1936 to 1947 in Bihar after the formation of All India Kishan Sabha in 1936 backed upon the Bardoli Satyagraha in 1928 by Sardar Vallabh Patel and Champaran satyagraha in 1917 by Mohan Dash Karamchand Gandhi (Kandadai, 1986). After the Indian Independence, Bihar had witnessed a continued agrarian unrest and several peasant struggles of rural labour in the forefront including naxalite movements (Prasad, 1975, 1979; Wilson, 1999; Bhatia, 2005; Chaudhari & Chaudhri, 2003; Sengupt, 2008). The agrarian unrest had the structural factor including a stringent Permanent settlement Act, 1793 introduced by British Government. Upper-caste landowning classes had the absolute dominance of land and

control over the peasant class (Nayak, 2010). Meanwhile, Bihar became the first state where the Zamindari abolition Bill was passed in its legislative in 1949. However, this took a long period to enact due to the opposition of this bill by many big landlords or Zamindars. This bill was also opposed by Dr. Rajendra Prasad, Maharajadhiraj of Darbhanga, and even the first Chief Minister of Bihar. It was simultaneously supported by Revenue Minister Kb Sahay, Kishan Sabha, and the rural farmers (Sharma, 2015; Choudhary, 1987).

Moreover, even after the enactment of the Zamindari Abolition Act (1949), it became meaningless due to the Benami transactions of the lands by the big landlords in the name of his nearer servants or the middle-class people. However, the enactment of this act had improved the economic condition of the middle class, but the condition of the lower caste remains the same as it was before (Dash, 1992). The upper caste peasants forced backward and Dalit caste labour into feudal tenancy and unfree labour for endless unpaid exploitation. This eventually led to unrest, manifesting in terms of greater number of marginalized communities organized under Maoist left parties, directly confronting the landlords with violence.

By 1990s, landlords were equipped with the licensed guns. Subsequently, different groups of landlords of various districts and castes made their own armed guards named Bhommi Sena, Lorik Sena, Kuer Sena, Brahmarshi Sena, Sunlight Sena, etc. (Mishra, 2002; Chouhan, Chouhan & Singh, 2004; Louis, 2000). The mafias quickly spread their business offering protection and goon services to political parties, leaders and anyone for a price. The decade of 1980 and 1990s have become lost decades mired in violence and stagnation. Bihar came under the fiefdom of contractors, black marketers, smugglers, gun-runners, mafia-boss, corrupt politicians & bureaucrats. Fighting for power and agrarian violence among the caste groups became day-to-day activities. Rich people, including merchants and traders, tried to protect their avenues of accumulation while the poor were trying to survive. Such a jungle raj left only one option for labour and capital, is to flee. Entrepreneurship becomes the natural causality, which is bound to delay any kind of capitalist development.

The electoral politics too travelled on road with no forward looking of growth and development. Going a period before, the decade of the 1970s witnessed a remarkable transformation in the structure and style of Indian Politics as well as of Bihar. In contrast to the electoral challenge to the Congress governments in the 1960s, the phenomenon of "anti-Congressism" in the 1970s increasingly took the form of mass-movements which have oscillated between local concerns and national appeal. The total Revolution Movement (Sampurna Kranti),

led by Jai Prakash Narayan was the result of the movements that shook up Bihar's and Indian politics between 1974 and 1975. The main agendas of the the movement was to challenge the political system, against corruptions, social unrest, and to improve the existing conditions in the sphere of the economic, educational and other (Shah, 1977). In a series of articles published in economic and political weekly (EPW), Ghanshyam Shah writes that “ The Bihar movement was a rebellion protesting against the failure of the congress rule to deliver the goods, it ventilated dissatisfaction and grievances of larger sections of the society. The partner of the movement used the upsurge of the people for dethroning congress. The *sarvodaya* workers who had revolution in their heart were not interested in taking political power to reshape the socio-political and economic order. And the political parties were not interested in Revolution”.

Therefore, the student communities of several organisations (Akhil Bharatiya Vidyarthi Parishad (ABVP), Bihar Chhatra Sangarsh Samities (BCSS), Samajwadi Yuvajana Sabha (SYS), All India Students Federation (AISF) were the vanguard of the movement and Jai Prakash Narayan were leading it (Shah, 1977). Lalu Prasad Yadav had played an active role in the movement when he was elected as the president of the Patna University Students Union with the demands related to food and education in the university hostels. The revolution has empowered student politics in Bihar as well India and also it set up new socio-economic order in Bihar. However, the mainstream politics enabled other backward castes to rally, like Yadavs, Kurmies, etc, in which Dalit's were largely left out, until leaders like Ram Vilas Paswan arrived in 1991. Naxalite movement offered some resistance to empower Dalit castes to be met with heavy repression. (Bhatia, 2005; Kujur, 2008; Kumar & Mishra, 2011) new political parties had immersed against the prevailing situation, i.e., New Communist Party of India (Maoist Communist Center) CPI (MC), Mazdoor Kisan Sangram Samiti (MKSS), Indian People Front (IPF), AISA, All Bihar Student Union, and Jan Sanskriti Munch (JSM)(Dash, 1992; 1987; Nayak & Kumar, 2009).

In late 1990s, against all odds, struggle and social movement, for the first time a new Chief Minister was elected belonged to the middle backward caste as in against of upper caste rule in Bihar till 1990. The emergence of Lalu Prasad Yadav was a major political change. In fact, this seminal change in politics was the response to the oppression and negligence of development by successive Congress governments. The rule of Lalu Prasad Yadav began with huge expectations, but unfortunately it soon degenerated into same old corrupt and thoughtless way, however, in a different social order. Only three white-collar Jobs were flourished in urban Bihar, i.e., Medicine, Civil engineering, and political power brokerage called *Pairvikari* (Dash, 1992). Corruption became the wheel of commerce due to the manufacturing of bicycles and lanterns failing to take off in

Patna. Even Patna was a fast-growing city in terms of population and commerce, especially in medicine. In the book “The republic of Bihar” Arvind Narayan Dash writes, “On the one end Patna has urban growth without industrialization, wealth without production, money without culture, and at the other, it has gruelling poverty, misery, and brutalization of the large segment of its population.” Mafias and gangs began organising dacoity, kidnapping and murders for extraction and porous border with Nepal became very conducive for illegal arms smuggling. Violence had begun to rise at alarming levels. Loot, Murder, Harijan hunting, political goondas, laths bearing rich landlords, capturing pooling booths, Rangdari tax became like day to day activity.

Dash (1992) further state that in Yadav’s term, the oppression by the middle caste, especially Yadav’s, reportedly increased manifold on the lower as well as upper caste. However, such incidence can be looked as reversal of the power dominance from the upper class to middle and lower class people. The infamous ‘fodder scam’ has exposed the corrupt practices of channelling state coffers into political leaders, who would use the money for horse-trading during elections (Dash, 1992). At the economic development perspective, during the period of 1995 to 2005, it was the period of economic stagnation in Bihar where the distorted law and order, unemployment, and subdued growth rate broke the backbone of Bihar’s economy. At the advent of the twenty-first century in 2005, again against poor economic performance of Bihar economy a new government was elected in Vidhan Sabha in the name of Development. Nitish Kumar was elected as the Chief Minister of the state belonging to Janta Dal (United), JD (U) Political Party. A poor state is always hampered in its ability to spend money, and due to poor revenues. Poor revenues stem from poor infrastructure and poor business incomes, and poor tax realisation. The FRBM Act 2003 has also clipped the wings of state governments to resort to borrow. This forms a classical vicious cycle of poverty. Whoever could be the Chief Minister, but the million dollar question is what strategy can any government to adopt to break the vicious cycle of backwardness?

2.3 Economic Restructuring: Chequered History of Economic Growth

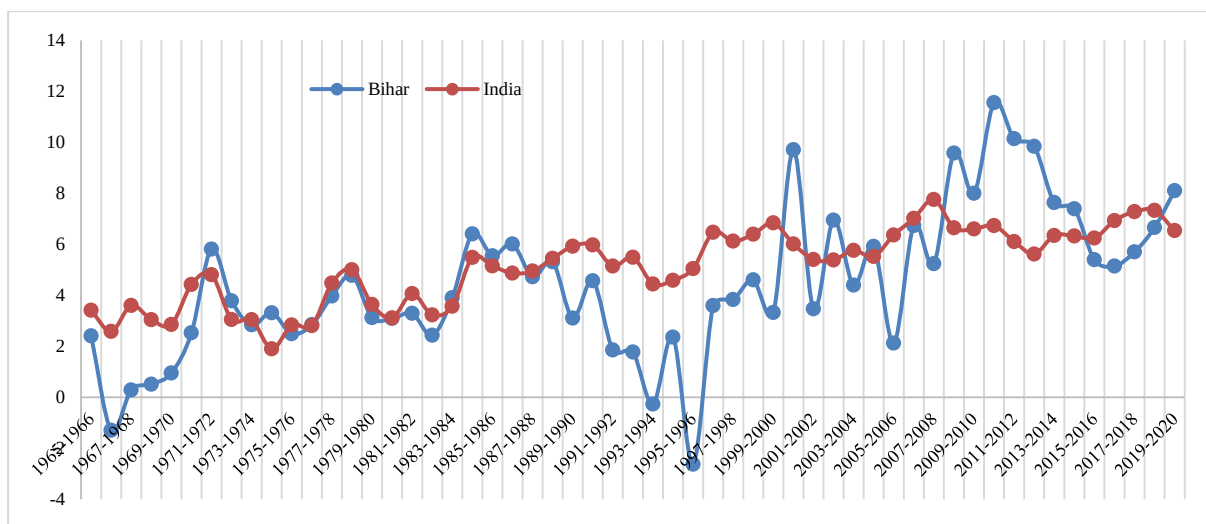
For first three decades of post-independence period, the Indian economy was primarily based upon agriculture in terms of both income and employment. On the same line, the economic status of Bihar was no different than India or even worse due to the reasons mentioned earlier. A five-year moving annual average growth rate of net domestic product (NDP) for India and Bihar in the post-Independence Era explicitly revealed that the growth performance of Bihar was poorer than the all India average in the initial period up to 1970-71 (figure 2.1). Further, in the period between 1971-72 and 1988-89, the average growth rate of Bihar has accelerated and hovered around the

Indian average. Economically, this was the period in which the per capita income of Bihar was faster than that of many Indian states (Mukherji and Mukherji, 2015). However, since the late 1990s, the economic condition of Bihar began deteriorating, and even the growth ratio of Bihar to India began declining till 1999-00. During this period, the performance of Bihar was at the lowest in all development indicators. Therefore many scholars characterised it as a “basket case” and later counted it among the worst-performing states, such as ‘BIMARU’ states⁸. Bihar even failed to channelise the growth potential that arose due to the liberalisation, privatisation, and globalisation (LPG) policy of the Indian government in 1991 (Ghosh and Gupta, 2010). Plan-wise growth rate of net domestic product (NDP) and per capita net domestic product (PCNDP) presented in Table 2.1 also shows the similar pattern of Bihar’s backwardness and its growth over the periods.

On the contrary, in the reform era, the growth performance of Bihar was moving in the opposite direction in comparison to the all-India average. The gap between the growth rates has an adverse impact on the per capita income as Mukherji and Mukherji (2015) pointed out that “the gap between India and Bihar, which started emerging in the latter half of the 1980s, expanded rapidly so that by the end of the century per capita output in Bihar was as low as a third of the national average. Even more dramatically, the level of per capita income in Bihar fell from 1,197 rupees in 1990/91 to 1,073 rupees in 1997/98. However, later in November 2000, Jharkhand became a separate province after bifurcation from Bihar. The bifurcation of Bihar into Jharkhand had a big hit on the manufacturing industries and the power sector of the state. Most of the industrial and power generation units were installed in the regions of Jharkhand. Therefore, due to this bifurcation, around 50 percent of the state income derived from the industrial sector and 70 percent of power capacity were transferred to Jharkhand. Decline in the GDP growth was the result of the bifurcation, however, it has started accelerating and reached around the average of all India growth rates after 2005-06 and continued till 2011-12. Later on the economic growth started declining as it evident that the growth rate almost declined by half of the percent in the later periods. The reason for such growth could be due to the growth acceleration in overall Indian growth rate (During 2004-10, India has also witnessed around 8 percent growth rate) and the base effect of low economic growth of Bihar before 2005-06, while later after reaching at a certain growth level the effect has come down.

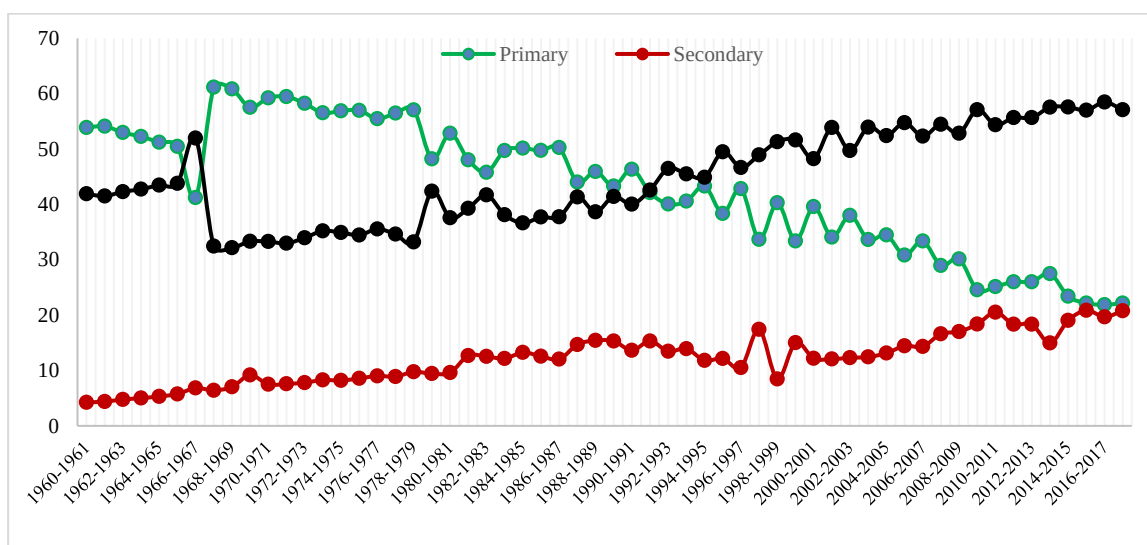
Figure 2.1 Five-year moving average growth rate of Bihar and India

⁸ The acronym ‘BIMARU’ is referred for the most worst performing states in India such as – Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh. This term resembles the sick nature of the state.



Sources: Authors Computations

Figure 2.2 Trends of sectoral share in NSDP of Bihar, 1960-61 to 2017-18



Sources: Author Computations

Table 2.1: Percentage annual growth rates (Compound) of NDP and PCNDP for Bihar and India at constant 2011-12 Price

Sl. No.	Plan	Years	INDIA		BIHAR	
			NDP	PCNDP	NDP	PCNDP
1	First plan	1951-56	3.87	2.84	2.00	0.97
2	Second Plan	1956-61	4.07	4.57	2.02	2.99
3	Third Plan	1961-66	2.96	2.48	0.69	0.63
4	Annual Plan	1966-69	5.95	-1.17	3.65	-2.97
5	Fourth Plan	1969-74	2.99	-0.09	0.69	-2.82
6	Fifth Plan	1974-79	4.52	4.17	2.22	1.94
7	Annual Plan	1979-80	0.95	0.59	0.93	2.86
8	Sixth Plan	1980-85	5.09	6.84	2.87	5.24
9	Seventh Plan	1985-90	5.39	2.51	3.17	0.38
10	Annual Plan	1990-91	1.05	9.49	1.03	7.45

11	Annual Plan	1991-92	1.01	-6.57	0.99	-8.54
12	Eight Plan	1992-97	5.9	2.59	3.87	0.19
13	Ninth Plan	1997-02	5.11	3.9	3.07	1.1
14	Tenth Plan	2002-07	7.1	6.75	5.29	5
15	Eleventh Plan	2007-12	7.76	9.74	6.27	8.17
16	Twelfth Plan	2012-17	7.41	6.06	5.62	3.97
17	Average	1951-2017	4.45	3.42	2.77	1.66

Source: Mukherji and Mukherji. NDP= Net Domestic Product, PCNDP= Per capita Net Domestic Product

The impact of such dwindling growth rates on the structure of the economy can be easily traced in [figure 2.2](#). It shows the share of the three broad sectors – primary, secondary and tertiary in the overall net state domestic product of Bihar over 1960-61 to 2017-18. It is apparent that the primary sector was the main source of income until 1990. Though, the agricultural performance was near stagnant between 1967-68 and 1978-79, while the share of the secondary sector was proportionately increasing in the period. Further, the agricultural share was continuously declining in the post-liberalisation period, with the highest fluctuation in the late 2000s. The Agriculture road maps have a positive impact in raising the agriculture productivity and sustained growth.

The tertiary and secondary sector's share continuously increased. . A significant decline in the primary sector share and sustained growth rate of some of the important sectors are crucial for structural change in the economy as it is seen that the growth of the service sector and its income share was also commendable in the period. The structural change in the economy has many dimensions. There are several factors that work together for such structural changes, such as –the way of governance, social structure, public policy, and its implementations are some of essential factors. Such interaction in Bihar proved efficient towards growth and development prospects of the state under Agriculture roadmap (2008) and '7 Nischay of atamnirbhar Bihar' (7 determination of self-reliant Bihar). This 7 *Nischay*⁹ mainly focused on youth and female employment and infrastructure development in rural regions. Government expenditure in terms of Investment in development projects such as infrastructure, roads, electricity, etc., enhance the growth rate of the economy. Bihar has also seen a significant infrastructure investment in the recent decade and has improved in the dimension of the poverty Head Count Ratio (HCR)¹⁰ too. It has shown significant improvement regarding poverty reduction of about 20% in the decade ([Tendulkar, 2009](#)).

⁹ The project 7 Nischay includes – a) Arthik hal Yuva ko Bal, b) Aarakshit Rojgar Mahilao Ka Adhikar, c) Har Ghar Bijli, d) Har Ghar Nal Ka Jal, e) Ghar Tak Pakki Gali – Naliyan, f) Shochalay Nirman Ghar ka Samman, and g) Avasar Badhe Aage Padhe.

¹⁰ HCR= Ratio of The number of person below poverty line to the total population of the economy.

2.4 How does Governance Matter?

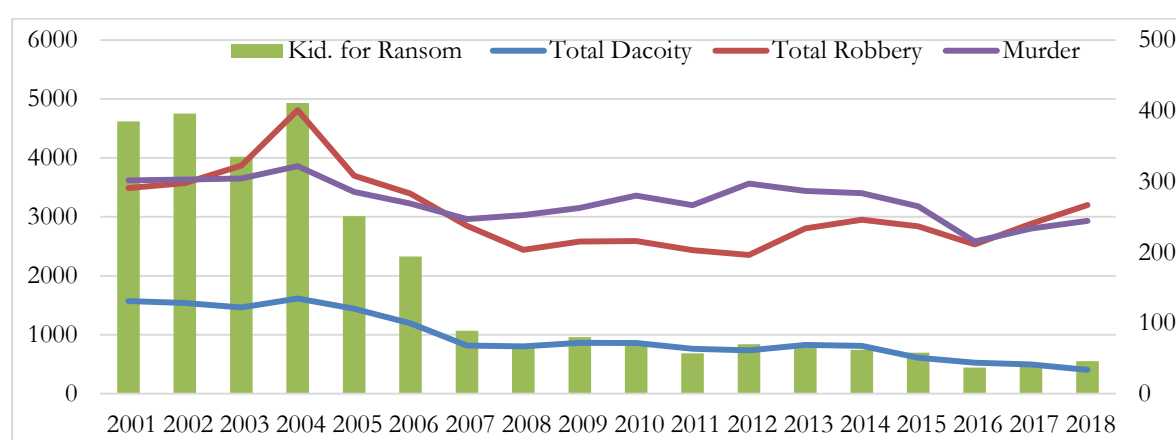
The way of governance in any government differs, and also it is complex to measure. Though World Bank defines governance as “Governance consists of the traditions and institutions by which authority in a country is exercised. This includes the process by which governments are selected, monitored and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them”. Further, World Bank adopted six dimensions of governance produced by Kaufmann et al. (2010), known as the Worldwide Governance Indicator (WGI). The six indicators are –a) Voice and Accountability, b) Political Stability and Absence of Violence/Terrorism, c) Government Effectiveness, d) Regulatory Quality, e) Rule of Law, and f) Control of Corruption.

Considering the governance in Bihar, it can be divided into broadly three regimes of governance in post-independent India – the first regime was until 1990, the second regime was 1990 to 2005 and, the third regime is continuing since 2005. In the first regime, the governance was controlled by the Indian National Congress (INC), where the chief ministers were mostly of the upper caste. In the period of almost 30 years, there were twenty-four chief ministers, and none of them have completed five-year terms in independent India except Sri Krishna Sinha. Sri Krishna Sinha of INC was the only Chief Minister who ruled over 11 years till 31st January 1961 after Independence. In addition, President’s rule was implemented five times in the regime. The first regime was well recognised for its unstable political system, frequent caste-based atrocities, caste-based politics, and decadency of economic activities in Bihar. Against all socio-political unrest in Bihar, Lalu Prasad Yadav, a prominent face in the Jai Prakash ‘Total Revolution Movement’ emerged as a leader of ‘other backward caste and middle class’. He chaired as a chief minister of Bihar in 1990 and also he was the first chief minister who served for a five-year term after 1961 in the Independent Bihar. At the socio-political perspective the emergence of Lalu Prasad Yadav has restructured the social order which resulted the emergence of middle caste and class people. On the other hand, the economic status of Bihar went on deteriorating and was considered as one of the worst-performing states in terms of growth rate.

There were two fundamental reasons for such dwindling economic conditions. Firstly, underutilisation of central funds, raising unemployment and unwillingness for development of the state government (Roy, 2015). Secondly, widespread corruption and inefficient administration

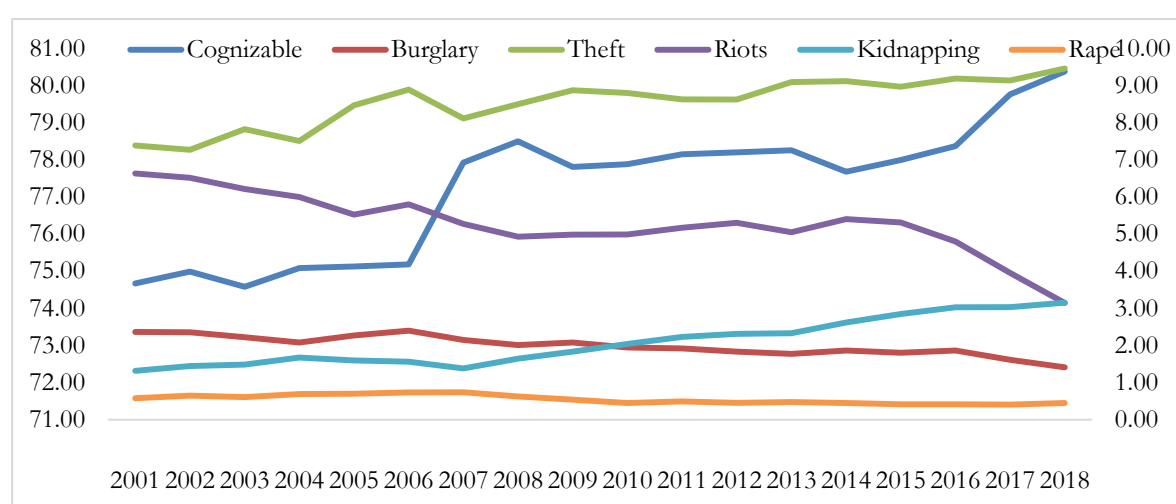
badly hit the economic growth of the state. The most famous *fodder scam* was one of the main reasons that caused Lalu Prasad Yadav to resign from the chief minister post. The emergence of a new political party – Rashtriya Janata Dal¹¹ and Rabri Devi as the new chief minister of Bihar was a consequence of the latter. Hence, Rabri Devi ruled over seven years until 2005. In her tenure, law and order of the state were in the vulnerable state as the crime statistics show that it was much higher than the previous periods and at the all India level. Murder, dacoity, burglary, theft, robbery, and kidnapping were the day-to-day activities in Bihar. Kidnapping for ransom and bank robbery were frequently reported in this regime (Polgreen, 2010).

Figure 2.3 Crime statistics in Bihar, 2001-2018



Source: Bihar Police, Government of Bihar.

Figure 2.4 Share of several crimes in total Crime in Bihar



Source: Bihar Police, Government of Bihar.

¹¹ Rashtriya Janata Dal was a renaming of Janata Dal by Lalu Prasad Yadav. Though, he himself holds the presidential position of the party.

Bihar witnessed another major political change in November 2005, when Nitish Kumar was sworn in as a chief minister of Bihar belonging to the Kurmi community – another caste in the other backward caste category. Nitish Kumar was a socialist class of politician, and he was also a part of Jai Prakash Movement between 1974 and 1977. In the Lalu Yadav regime, Nitish Kumar was a member of his party, but he separated from the Janata dal party and formed a new party known as the Samata party with his friend George Fernandes in 1994. However, this party name did not sustain for long and was further renamed Janata Dal (United) in 2003. Other smaller political parties supported the political party of Kumar, and so National Democratic Alliance (NDA) was formed to rule in Bihar. The rise of Nitish Kumar was at the stake of widespread violence and the dwindling economic condition of Bihar. Therefore, the first and foremost priority of the government was to address the law and order situations with economic growth.

In terms of governance in the new government, the crime statistics shows the law and order situations of the state. Figure 2.3 and 2.4 crime statistics in last 18 years. It shows that the major crime incidence such as – kidnapping for ransom, dacoity, murder, and robbery has come down over the period. On the other hand, other crime such as – cognizable offence, theft, and kidnapping has increased even after 2005-06. The period after 2005-06 has witnessed two important phenomenon, firstly, the improved law and order have reduced the most of the horrific crimes. On the other hand, an increase in the cognizable crimes. Secondly, in the first period of governance of JD (U), an increase in the economic growth, while it went down in the subsequent terms of the government.

2.5 Conclusion

We tried to reflect on the given historical position of backwardness of Bihar. Bihar had a very rich and glorious time until medieval times. British colonialism had set devastating impact of creating feudal relations in the region. Bihar became notorious for failing to implement Zamindari abolition that perpetuated strong semi-feudal relations in production processes of Bihar. The first period of post-independence period, beginning with 1950s to late 1990s saw setting in stagnant conditions; the second period fall between 1990 and 2005 saw rise of Backwardness consciousness and ending of monopoly of Congress Party; and the last period is post-2005, which eventually brought democratic as well as federal compulsions of showing growth and development. The major changes in the social and political order in the second period was the repercussions of the social and agrarian unrest aroused in the congress government during the first period. Therefore, the second period has an important role in the Bihar's development path in the form of a

significant changes in the social order where several revolutionary and naxalite movements had empowered the socially and economically disadvantaged castes or classes of the society. On the other hand, apart from social reforms, the economic growth in the short period has regained its importance and therefore the economic growth of Bihar has shown significant changes due to several development policies by the state government. Thus one can legitimately claim that economic development in Bihar is delayed for having dormant feudal forces at work, which resulted in chaotic conditions, where democratic forces had to wage a war. The violence, corruption, and poor law and order situation in Bihar continue to pose questions the potential of economic growth in the long run and social justice in the society. From these shackles, we argue that Bihar is breaking out. We explain these in the coming chapters.

Chapter 3

Economic Growth in Bihar: A Sectoral Analysis

3.1 Introduction

The assessment of the performance of an economy is usually based on the growth in the aggregate income/output, and it reflects the size of gross domestic product. The gross domestic product is an aggregation of incomes generated through the various identified sectors. As per the national Industrial classification -2008, the Indian industries have been classified into three broad sectors, namely- primary, secondary and tertiary sectors. Within these broad sectors, there are many identified sub-sectors according to the industrial classification. The importance of these broad sectors varies based on the specific regions and the available resources for utilization. In addition, development theories suggest the role and importance of these sectors in the development process of an economy (Lewis, 1954; Mahalanobis, 1933; Ranis & Fei, 1961; Syrquin, 1988). At the early stage of development, the role of the primary sector is vital, as this sector employs a large section of the society and is considered as the labour-intensive sector with little scope of technological improvement. Later, its importance declines with the faster growth in secondary and tertiary sectors in the development process. At the same time, the role of the manufacturing and service sector emerges as a significant factor in the overall development. It is because of an ample scope of expansion in the manufacturing sector through the proper utilization of capital, technology, and labour. On the other hand, with an enormous expansion capacity, the service sector is bound to be capital and technological intensive sector with limited labour power (Aggarwal, 2016; Aggarwal & Kumar, 2015).

Moreover, considering several sectors in an economy, the changes occur in two ways – a) changes in the size of the economy; and b) changes in the structure or shape of the economy. A continuous growth in income, over the periods, determines the size of an economy, and share of the sectors in the overall income determines the structure or shape of the economy. On the other hand, changes in the composition of the income shares among the sectors are prerequisites for structural change in income. Therefore, growing size of the economy with a reasonable sectoral contribution is always significant in the development process that caters to the better living standards of the population. Apart from changes in the income share among the sectors, labour dynamics also have a prominent role in productivity growth and structural change in the form of economic growth. The dynamics of labour, in terms of activity status and employment status has

been discussed in chapter 3. This chapter deals only with a detailed analysis of the trends and patterns of the income/output in Bihar at the sectoral level, and the sources of growth have been analysed in terms of sectoral contribution to growth in the process of structural change.

Bihar, as we said, is the most underprivileged state in India and has been in the news for its dramatic turnaround in growth rate since 2006. However, Bihar is not the only state that has grown at the high growth rate. Bihar is among the top three states that stand out by a growth of over 10 percent per annum between 2006-07 and 2010-11, after long spells of stagnation during the 1990s (Singh & Stern, 2014). In the late 2000s, several articles and commentaries discussed the reasons and determinants of such growth rates. Nagraj & Rahman (2010) attributes to an increase in the government expenditure and public works in the economic growth, especially the growth in the construction sectors with an increased labour force. Gupta (2010) found cyclical growth trends of the income since 2000-01 and a more stable growth after 2006. Further, she analysed that more than 74 percent share in growth is contributed by only four sectors- agriculture & allied, construction, trade, hotels and restaurant, and communication, with the highest percentage of trade, hotels, and restaurants. She further asserted that the growth in trade, hotel and restaurants has started in 1994-95 and continued until the date. Others recognised the role of the institution as a driver of growth in Bihar, and the entire debate on growth realm turn-around the notion of “development with social justice” through “good governance” of the present government in comparison to its predecessor. However, any inferences drawn in those periods could be opined a bit hasty for a very short period of analysis considered in these studies.

Therefore, the main objective in this chapter is to understand the trends and patterns of the income/output over a comparatively long period from 1993-94 to 2017-18 in Bihar and to explore the sources of economic growth and structural change in income at the sectoral level. Further, the role of the identified sectors has also been analysed in economic growth with a comparative analysis over several regimes. Specifically, this chapter concentrates primarily on three different issues – a. trends and patterns of growth among different growth regimes; b. growth decomposition to illustrate the sources of growth for several growth regimes; and c. the role of sectoral composition to structural change for the study period. The other five sections of this chapter are categorised as follows: section 4.2 presents the data and methods used in this chapter. A sector - wise comprehensive analysis of growth and structural change is done in section 4.3. Section 4.4 decomposes the growth rate to understand the sources of growth in terms of sectors. The

determinants of economic growth and structural change has been addressed in the in section 4.5, and lastly, section 4.6 concludes the chapter.

3.2 Data Source and Methodology

3.2.1 Data Source

The estimation here are based on the time series data on Gross domestic product. The data are taken from the Ministry of statistical and programme implementation (MOSPI), database on Indian Economy from Reserve Bank of India (RBI), and Economic & political weekly research foundation (EPWRF). Apart from this, various data sets have been extracted from various reports of the National Institution of Transforming India (NITI) database and Economic survey of Bihar and India. To meet the objectives of this chapter, the GSDP is categorised into three broad sectors - Primary, Secondary, and Tertiary, and it is further subdivided into overall ten parts, as shown in table 3.1.

Table 3.1 Sectors of Gross State Domestic Product

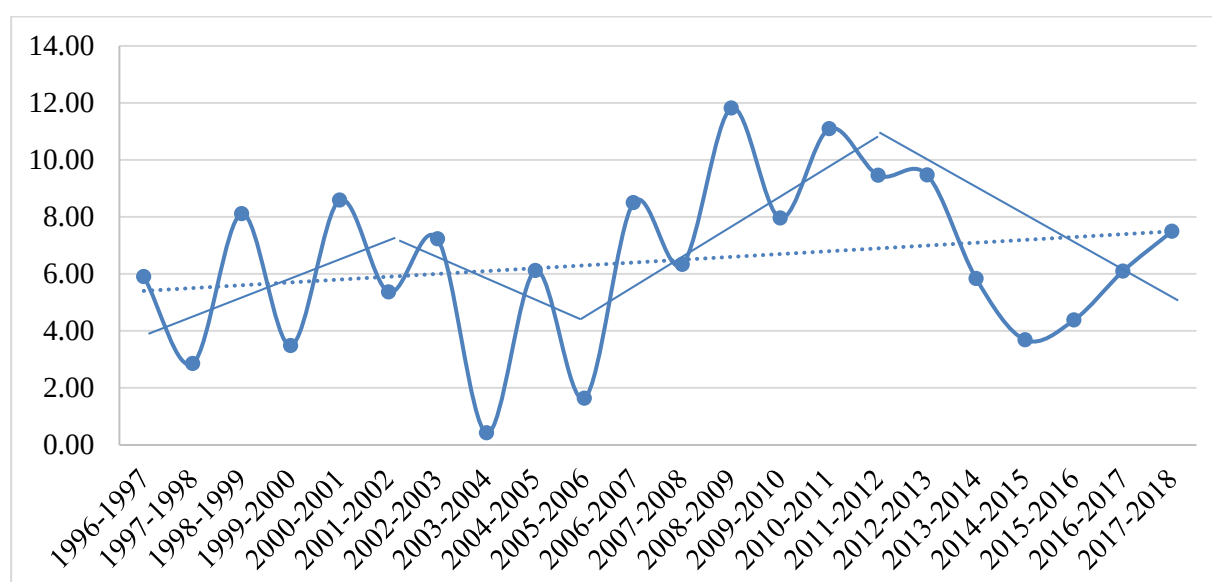
Sl. No.	Sectors of GSDP	Abbreviations Used
1.	Primary	Primary
1.1	Agriculture and Allied Activities	Agriculture
1.2	Mining and Quarrying	Mining
2.	Secondary	Secondary
2.1	Manufacturing	Manufacturing
2.2	Construction	Construction
2.3	Electricity, Gas and Water supply	Electricity
3.	Tertiary	Tertiary
3.1	Transport Storage and Communication	Transport
3.2	Trade, Hotels and Restaurants	Trade/hotel
3.3	Banking and Insurance, Real Estate, Ownership of Dwellings and Business Services	Finance
3.4	Public Administration	Public admin
3.5	Other Services	Other service
1+2+3	Gross State Domestic Product	GSDP

Source: Author's Construction

While analysing the growth accounting macroeconomic variables, an implicit determination of base year is one of the major challenges any researcher faces. Changes in the base year are a

continuous process adopted by the ministry of statistics and programme implementation (MOSPI) at a regular interval to check the inflation factor in the economy. Several base years are identified based on a very long time series data of macroeconomic variables. In this case, the conversion of the data for each base year on a single base year is the basic practice adopted by researchers. Splicing is the procedure followed while converting a time series data on a single base year. MOSPI revised the base year four times between these periods, i.e., 1993-94, 1999-00, 2004-05, and 2011-12. The latest base year 2011-12 has been chosen for the study, and hence all relevant data have been converted using splicing factor and respective Gross State Value Addition (GSVA) values of 2011-12 as the base. The data series on Gross state domestic product has been generated after summing the sectors of GSDP.

Figure 3.1 Moving average growth trends of GSDP of Bihar



Sources: RBI database.

If the post-reform period to be subdivided for analytical purpose, one way is to divide it into two regimes – a) 1993-94 to 2005-06 (regime1); b) 2006-07 to 2017-18 (regime2). Further, two sub-periods are identified within each regime, for instance 1993-94 to 2000-01 (period 1), 2001-02 to 2005-06 (period 2) and 2006-07 to 2011-12 (period 3), 2012-13 to 2017-18 (period4). The first phase marked some stagnation while the second phase witnessed an acceleration. The growth rates of Bihar over these two phases are presented in the figure 3.1. However, both phases witnessed a rise and fall of growth indicates that the growth performance for these periods have varying episodes of growth rates. Therefore, the determination of the regimes are largely based on the characteristics of economic growth. One of the significant differences between the regimes is that

regime2 has never witnessed a negative growth rate while for the four times negative growth rates have been observed in regime1. Further, the average growth rate in regime2 was 77.86 percent higher than its counterpart. This is similar for all India level, as GDP growth during 1993-2005 is at 5.7 percent, while 2005-17 is 8.2 percent.

3.2.2 Growth Decomposition

We have decomposed the growth of GSDP into its sectors and analysed its contribution to the economic growth for the given periods. Hence, the method of decomposition follows growth-share analysis (Balakrishnan & Parameswaran, 2007; Priyabrata, 2019; Gupta, 2010). While doing so, we have used following specifications for Bihar's growth decomposition in terms of gross state domestic product and its sectors.

$$g_{yt} = \sum s_{it} * g_{it} + e_y \quad (1)$$

Here, i and t denotes GSDP sectors and regimes/periods respectively.

g_{yt} : Compound growth rate of output/income in period/regime t .

g_{it} : Compound growth rate of output/income in the i^{th} sector in period/regime t .

s_{it} : Average percentage share of the i^{th} sector in GSDP in period/regime t .

e_y : Residuals term obtained due to annual volatility in the growth rate.

Now, let us consider for t regimes/periods – and i sectors, the change in the growth rate between regimes/periods is given as follow:

$$\Delta g_{yt} = \sum \Delta(s_{it} * g_{it}) + \mu_y \quad (2)$$

Here, Δg_{yt} is the change in the growth rates between two regimes. Therefore, change in the growth rate is the sum of the change in the average share and growth rate of the sectors for two regimes/periods.

3.3 Structural Change and Economic Growth: A Sectoral Analysis

Among the three broad economic sectors in Bihar, the tertiary sector has been leading the growth during the study period. The primary or agriculture sector has been crucial in employment generation. Thus, the economy of Bihar is fundamentally agrarian, in spite of service-leading the growth, with the high share in the state income. Historically, secondary sector is known to be the driver of structural change and economic growth. However, in the case of Bihar, the role of secondary sector has always been very limited since independence. The contribution of secondary sector even became insignificant after bifurcation of Jharkhand from state of Bihar in November 2000. The part of Jharkhand region of Bihar has rich sources of mining, quarrying and manufacturing base, which is alienated from Bihar due to the bifurcation. According to Mukherji

& Mukherji, (2012) shares of the manufacturing sector, especially mining & quarrying in total GSDP of Bihar, went down by around 30% after the bifurcation.

Despite the bifurcation, however, Bihar has been showing decent growth rates in both agriculture, as well as service sectors, with a marginal growth of the secondary sector (especially construction) since the last decade. A detailed sectoral analysis gives a better understanding of structure of growth in Bihar. In this chapter, we present the decomposition of growth for the state of Bihar during 1993-94 to 2017-18. The data for Bihar is prepared by separating the contribution of Jharkhand, for the period of pre-bifurcation, so that we can have smooth comparison with subsequent period.

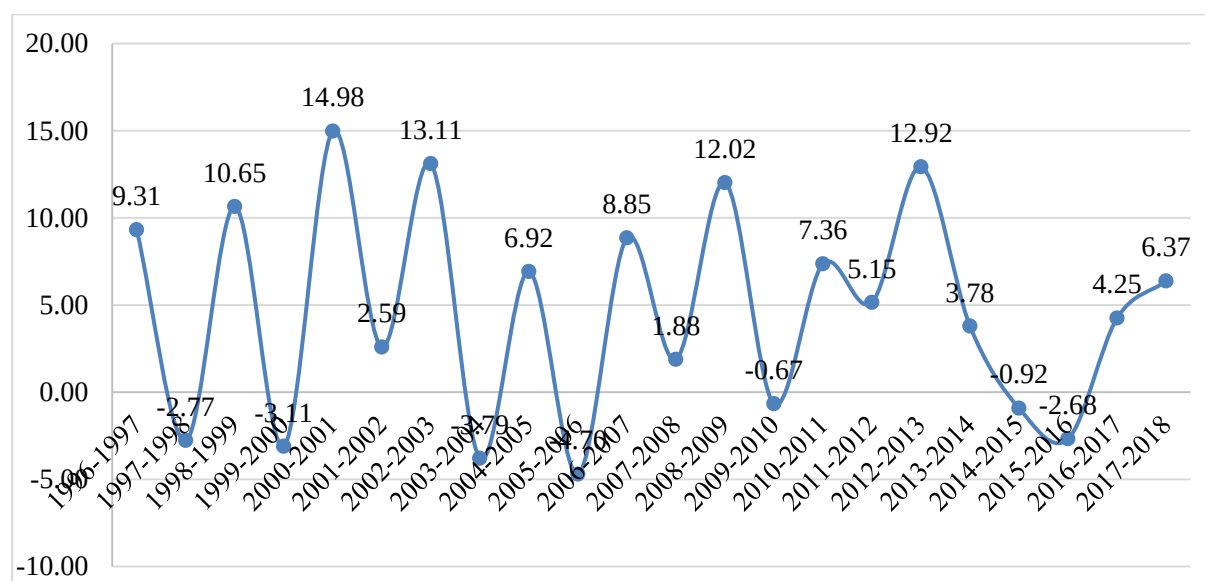
3.3.1 The Primary Sector

We know that primary sector consists of five sub-sectors, namely- agriculture, forestry & logging, fishing, livestock and mining & quarrying in the estimation of State Domestic Product (SDP). Some researchers consider mining & quarrying as a part of the secondary sector and some in the primary sector. In this chapter, mining and quarrying are subsumed under the primary sector for the broader analysis, but later, it is marked as a separate sector at a disaggregated level. Whereas agriculture & allied activities under the primary sector include agriculture, forestry & logging, fishing and livestock sub-sectors. The growth rate and the sectoral share are the two important aspects of analysing the performance of a sector in an economy. Therefore, the following paragraph discusses the trends and nature of primary sectors with detailed analysis considering sectoral growth and sectoral share aspects.

A perusal at the trends in the primary sector of Bihar between 1993-04 to 2017-18 shows that the growth rate of primary sector is highly volatile throughout the period (figure 3.2). However, the magnitude (either positive or negative) of the growth rate has shown stability over the years of development. Regime1 has the highest volatility in the growth rate with an average growth rate of 3.65 percent comprised with six times negative growth rates in a period of twelve years. On the other hand, average growth rate went up by 2 percentage point in regime 2 comprised with only four times negative growth rates with lesser magnitude. The focus on negative growth rate is important because of three reasons. First, a negative growth rate is unwanted for any type of economy. An economy has to perform much better to overcome the impact of negative growth. Secondly, on an average, the Indian economy has never experienced a negative growth rate for the periods whereas the Bihar economy has many. Third, the primary sector is known to be the backbone of an economy because of its interlinkages with the other two (secondary and tertiary)

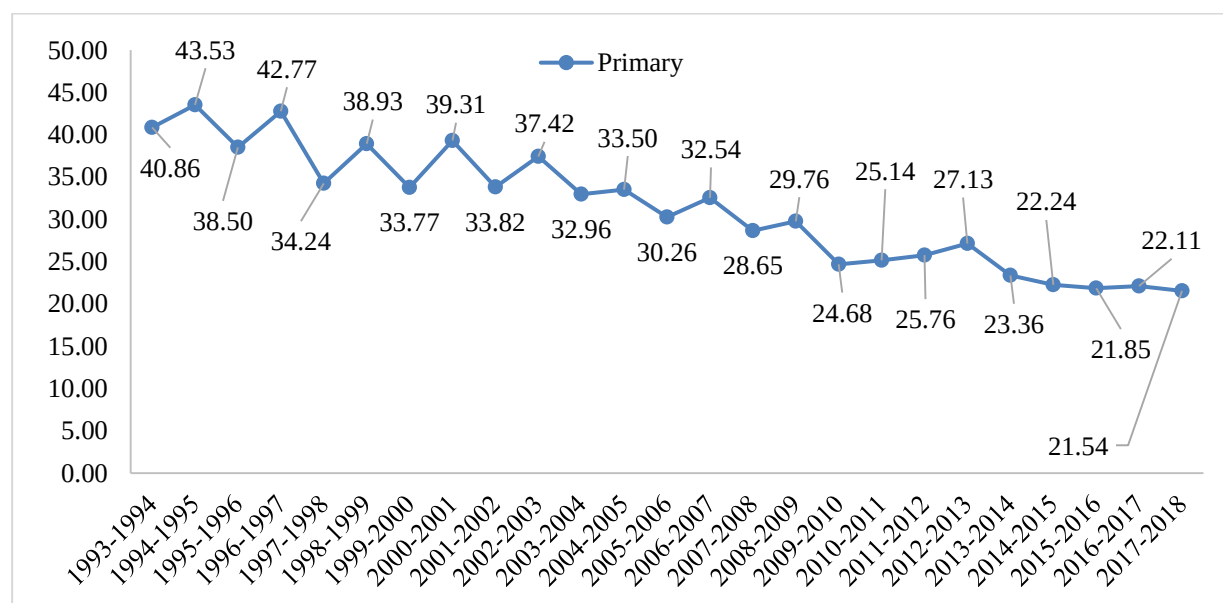
sectors. Therefore, the downward performance of the primary sector always has an adverse effect on the secondary and tertiary sectors. This is true in the case of Bihar economy too. *In regime2, the period between 2006-07 and 2011-12 has the highest average growth rate in primary sector compared other periods and that is why the period is marked as a high growth phase in Bihar.* Further, the cyclic trends of positive and negative growth rates were no longer seen in the subsequent years after 2010-11. Also, one of the major changes that can be observed that primary sector growth rate is consecutively positive since 2015-16.

Figure 3.2 Three years moving average growth rate of Primary sector for several periods



Source: RBI database.

Figure 3.3 Share of primary sector in GSDP



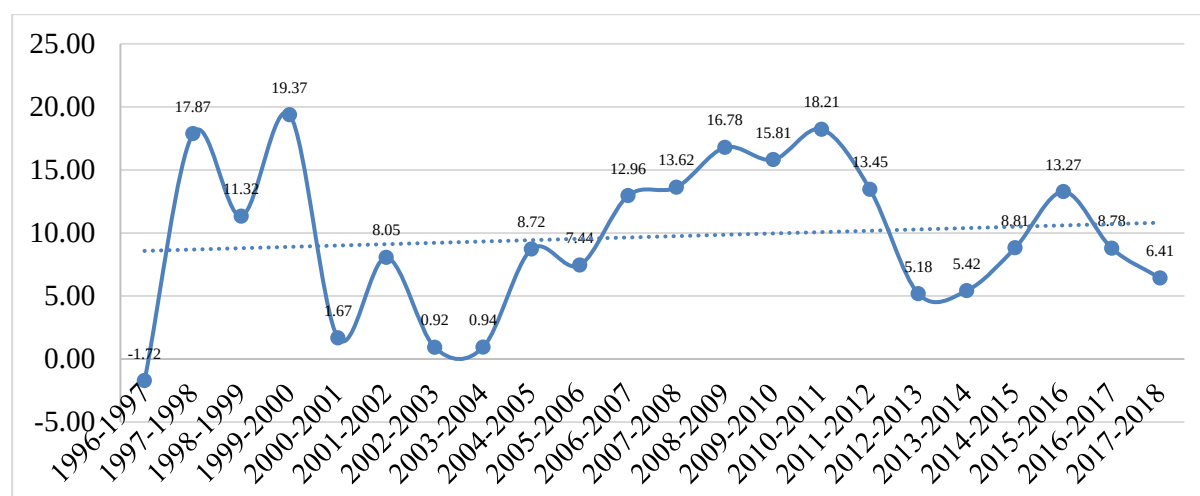
Source: RBI Database

Considering the sectoral share in GSDP, Bihar's primary sector contributed 21.54 percent during 2017-18. It declined by 19.32 percentage points from 40.86 percent in 1993-94 to 21.54 percent in 2017-18, as shown in figure 3.3. This is still far higher than the national average, where it contributed 12.5%, however, the decline is in the line with national trend, which is welcome. It is evident that the share of the primary sector has ups and downs year-on-year until 2009-10. The same trend has been observed in the case of growth rate of the primary sector. However, the ideal situation for an economy would be a decent growth rate with a declining agricultural share. A consistent decline in the share has been observed from 2012-13 to 2017-18. On the contrary, a continuous increase in the share by 2.45 percentage points has also been observed from 2009-10 to 2012-13. Apart from this, in primary sector, the share of agriculture sector has declined marginally, whereas the share of forestry & logging has increased in the primary sector along with fishing, mining and quarrying sectors.

3.3.2 The Secondary Sector

After the primary sector, the second most important sector is known as the secondary sector and is sometimes called the industrial sector. In the secondary sector, three sub-sectors are considered in the estimation of domestic product, namely- manufacturing, construction, and Electricity, Gas & Water supply. Manufacturing is one of the most crucial sectors that act as an agency for structural changes in an economy. An economy endowed with a good manufacturing base has such potential that it can grow relatively faster. Unfortunately, Bihar did not have any such type of base for several reasons. In addition, after the bifurcation in 2000, most of the major industrial units and mines pulled down to the newly formed state - Jharkhand.

Figure 3.4 Three years moving average growth rate of Secondary sector

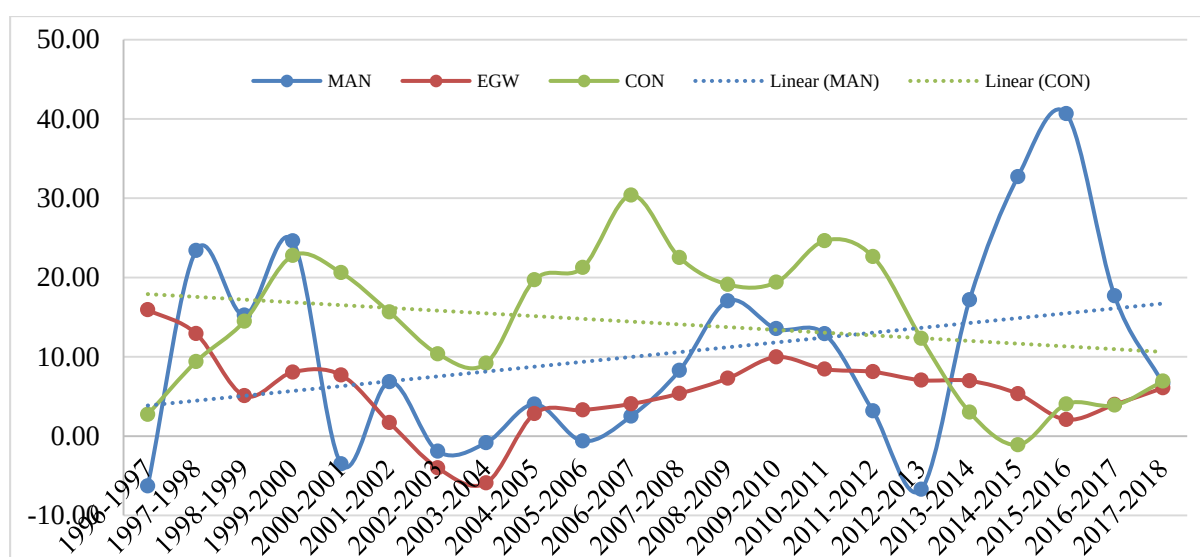


Source: Own computation data taken from DES, Bihar

The growth trend of the secondary sector also indicates an unstable growth rate in the initial and later years but less volatile than the primary sector (figure 3.4). A closer look on the trends and patterns of the growth rate illustrates that the average growth rate is 6.50 percent in regime1, while there is a negative growth rate for six times, indicating a slower performance. The highest and the lowest (negative) growth rate is observed in this period only. On the other hand, the growth rate is negative for only once in 2012-13 and the average growth rate is over 10 percent in regime 2. The five-year periods from 2001-02 to 2005-06, has the lowest average growth rate of 5.45 percent, while the average commendable growth rate is just above 15 percent between 2005-06 and 2011-12 as shown by the positive and increasing moving average growth trends. Overall, regime2 has a consistent and high growth rate (especially 2005-06 to 2011-12) compared to the regime1.

Further, an analysis of the performance of the sub-sectors of the secondary sector gives better insights for nature of growth. The growth rate of the sectors was not stable, and therefore, several ups and downs can be observed, making it difficult to determine any trends in short periods. Poor infrastructure is one of the most important characteristics of a backward economy, and Bihar is not an exception. In the process of development, the growth of infrastructure is needed, as can be pointed out from the figure that the average growth is led by the construction sector in Bihar, which grew by 13.09 percent during 1993-94 to 2017-18, while the highest growth rate of 14.28 percent is in regime1, followed by 11.89 percent in regime2. The average growth rate of manufacturing is also higher regime2, while a decent growth rate of 9.41percent is recorded over the study period. The average growth of the last sector - electricity, gas, water supply (EGW) is just below seven percent either in any regimes or over the years. The growth rate of EGW does not influence much on the overall performance of the secondary sector because of the minimal share in the domestic product. The second most important sector, construction, has the highest growth rate of 35.11 percent in 1998-99, and only once recorded 12.37 percent negative growth in 1994-95.

Figure 3.5 Growth rate of the components of the secondary sector for various periods



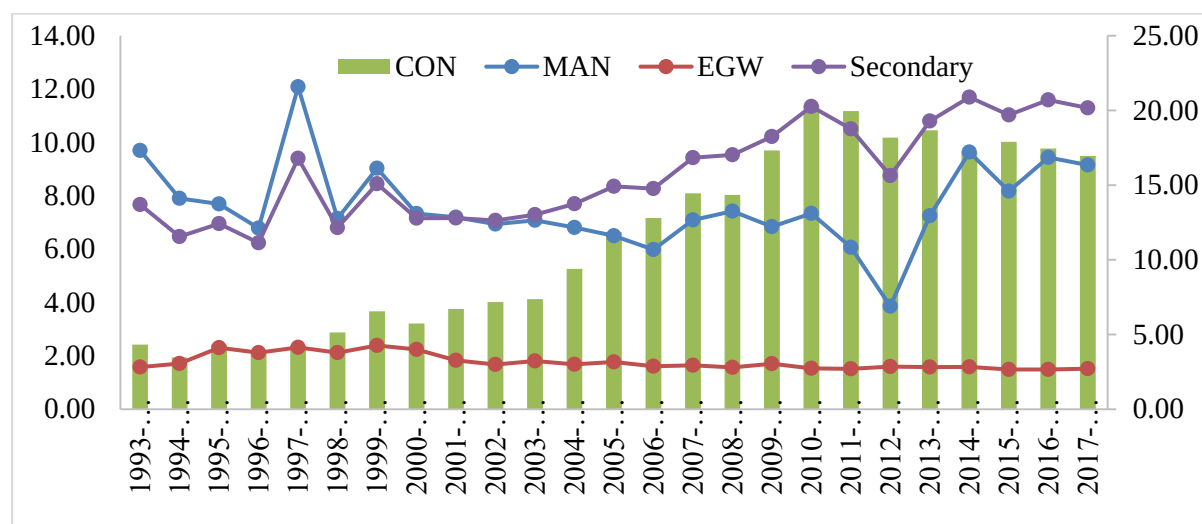
Source: Author's construction.

The phenomenal growth rate achieved in Bihar is spread among almost all sub-sectors of secondary sectors during the regime, i.e, 2006-07 to 2011-12. Among these sectors, only the manufacturing sector has only twice negative growth rate, while the average growth rate is higher than 18 percent for the rest of the year. Despite two downward spikes, the average growth rate is almost above 10.00 percent for the manufacturing sector, with an exception of electricity sector. The average growth is more than 20 percent for construction, while the highest growth rate achieved is 34.38 percent and the lowest is 7.81 percent. On the other hand, the average growth rate of the manufacturing sector is the highest after 2011-12.

Moreover, considering the sectoral share of the sub-sectors in GSDP, the hybrid version with line and bar graph shown in figure 3.6 illustrates the share of the secondary sector and its sub-sectors over the years. The graph has two axes on both the right and left sides of the vertical axis. The left side of the axis is meant for the manufacturing, electricity and secondary sectors, while the right side of the vertical axis represents the construction sector. The graph explicitly shows a positive trend for the secondary sector and construction, while a stable trend for electricity and the manufacturing sector. The share of the secondary sector is 13.70 percent, which goes up to 20.17 percent in 2017-18. The highest share recorded is 20.88 percent in 2014-15, while a dip of 5.25 percent is recorded one year back. Continuous growth in the share can be observed after 2002-03 until 2010-11 for the secondary sector. Later 2010-11, only three times the share dipped down to approximately 20.00 percent. A sink between the share of secondary sector and the manufacturing sector can be explicitly observed. The year of dip boom in the manufacturing

sector corresponds approximately similar to the dip/boom in the share of secondary sector. The sharp rise from 9.69 percent in 1993-94 to 12.08 percent in 1997-98 and again drastic fall to 9.15 percent in 2017-18 illustrates an unstable and negative growth in the share for manufacturing sector. For almost fourteen years (2000-01 to 2013-14), the share of the manufacturing sector hovered around 8-9 percent. Post 2013-14, the share started increasing, but it has never crossed the initial level.

Figure 3.6 Share of components of secondary sector in gross state domestic product



Source: Own computation data taken from DES, Bihar

The growth in the share of electricity is also negative over the years. The share of electricity has never crossed three percentages points over the years. However, the growth rate of electricity is impressive despite having a minimal share among the sectors. The highest share achieved is 2.39 percent in 1999-00, while the lowest is 1.51 percent in 2011-12. Construction is the only sub-sector in secondary sector that has a positive trend, and a significant rise in the share are recorded over the years. An increase by 6.73 percentage points from 2.42 percent in 1993-94 to 9.15 percent in 2017-18 is recorded. However, the acceleration in the share is mostly started after 2004-05 and climbed up to 20.26 percent. The average share went up by 6.14 percent from 3.46 in regime1 to 9.60 in regime2. A decline in the share after 2011-12 is because of the very poor growth rate of the construction sector after 2011-12.

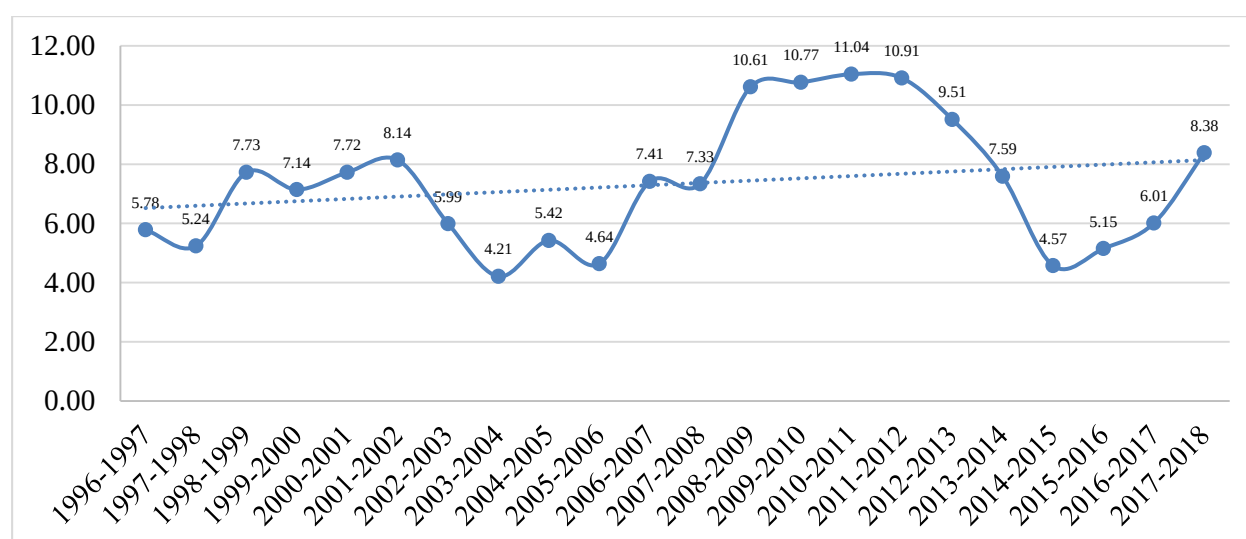
Overall, among the three sub-sectors of the secondary sector, a significant shift has been observed in terms of sectoral share. In 1993-94, manufacturing has the highest 70.76 percent share in the secondary sector followed by just 17.68 percent share of construction. Over the years, the construction share peeped up to 47.10 percent and the manufacturing share slide down to 45.37

percent in 2017-18. This drastic shift confirms the infrastructural development in the state, and the construction sector has emerged as the most employable sector. The interaction between the share of manufacturing and the construction sector appeared in 2006-07. On the other hand, the share of electricity in secondary sector has declined drastically from 11.55 percent in 1993-94 to 7.53 percent in 2017-18, despite having a fair growth rate over the years. Therefore, we have two different scenarios for the sectors: an increasing growth rate in the value-added while declining share among the sector.

3.3.3 The Tertiary Sector

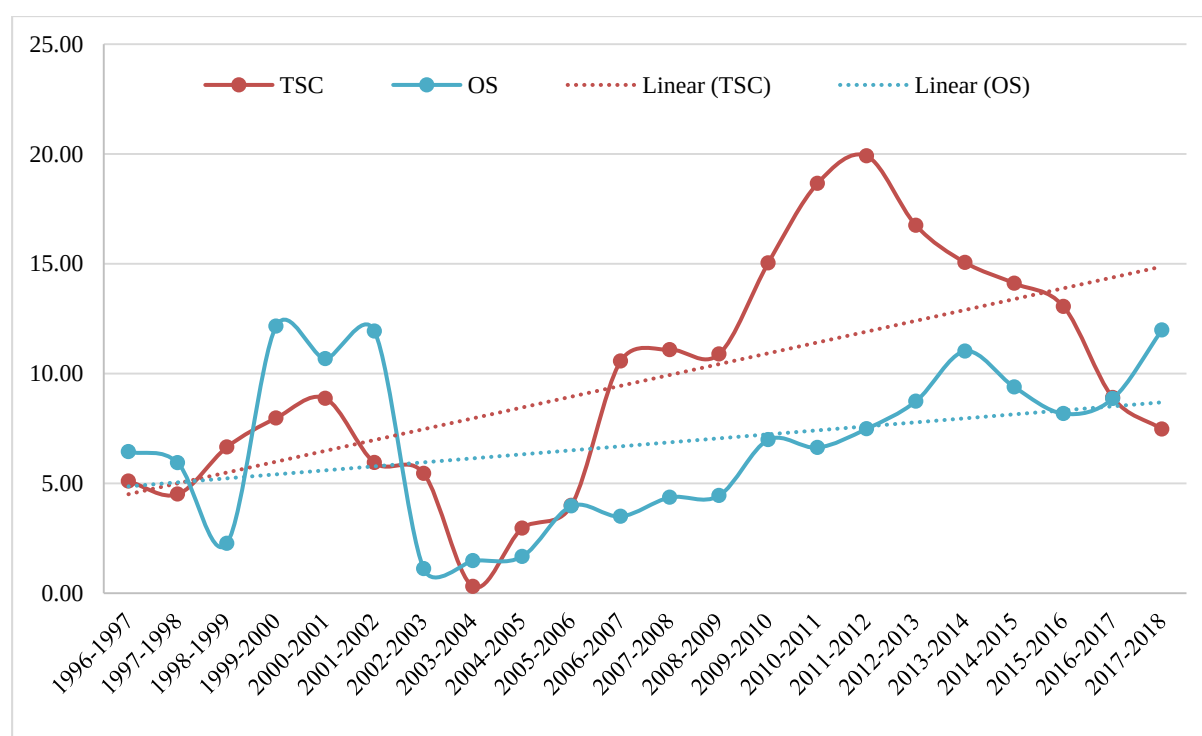
The third broad sector is the tertiary sector or service sector. It is the largest sector among all three sectors in terms of both numbers of sub-sector and share in total domestic product. This sector consists of many industries but is particularly grouped into five sub-sectors, namely – trade, hotels and restaurants (Trade/hotel); transport, storage & communication (Transport); Banking, insurance, real estate, ownership of dwellings and business services (Finance); public administration (Public admin); and other services. The tertiary sector is the only sector with positive growth rate throughout the years (figure 3.7). Unlike the primary and secondary sectors, the growth rate of the tertiary sector is much more stable and consistent over the years. Although the trends and patterns is quite similar to the rest of the two sectors. It is evident that the regime2 has the higher growth rates compared to the regime1. Specifically, the period over 2005-06 to 2011-12 has the highest growth rate in regime2 compared to other periods. The ups and down in the tertiary sector has been influenced by the growth performances of its sub-sectors, which has been discussed subsequently.

Figure 3.7 Three years moving average growth rate of Tertiary sector



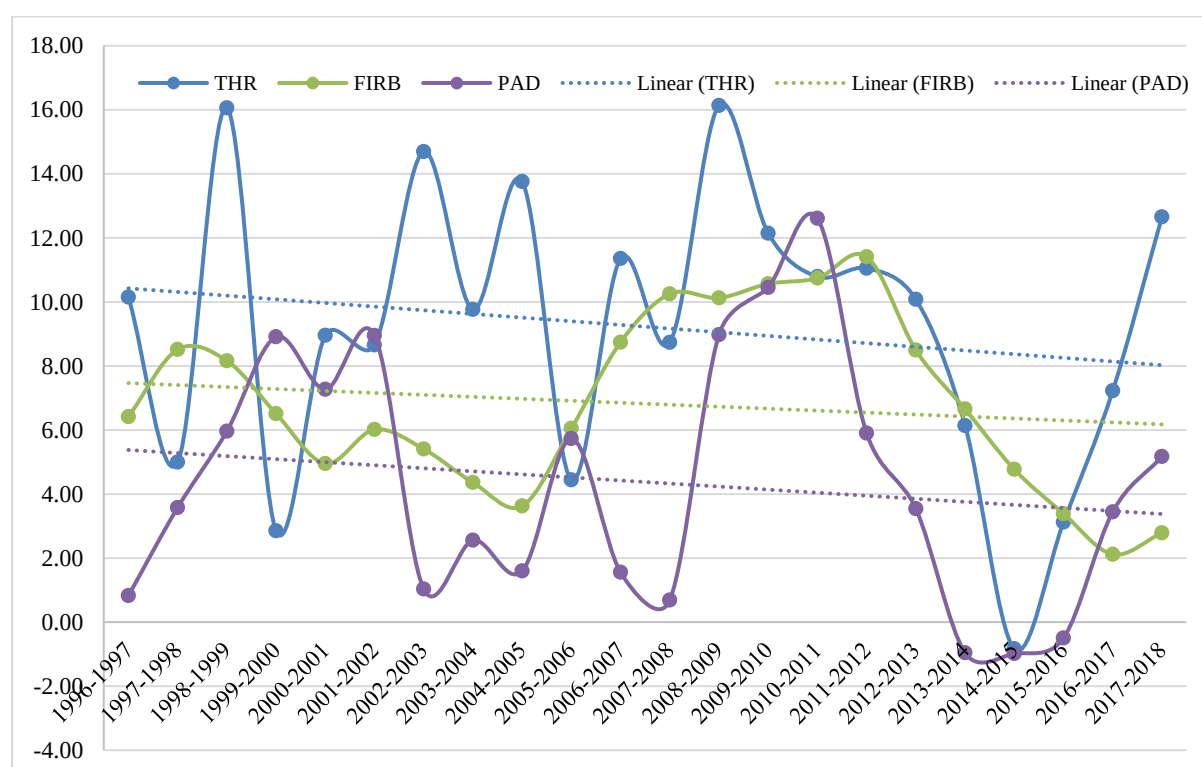
Source: Author's Construction.

Figure 3.8a Growth rate of components of Tertiary Sector during study periods



Sources: Author's construction using RBI database

Figure 3.8b Growth rate of components of Tertiary Sector during study periods

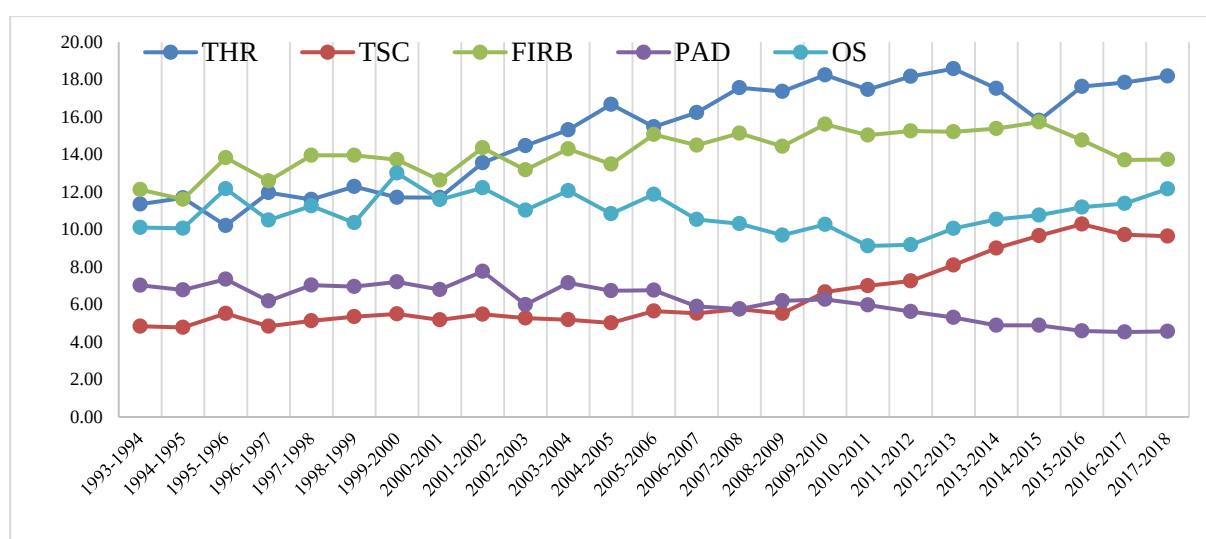


Sources: Author's construction using RBI database

Figure 3.8a and 3.8b illustrates a vivid account of the trends and patterns of the growth rates of the sub-sectors of tertiary sector. It is found that only two sub-sector – transport and other services has the positive trends and rest three sub-sector – Trade/hotel, Finance and public admin has a negative growth trends over the study period. Considering the two growth regimes of tertiary sector, only transport and other service has significantly different growth trends in regime1 and regime2. Transport has recorded the maximum growth rates and also the highest average growth rate in regime2 compared to regime1. However, a declining growth trends is also evident for Transport since 2012-13. On the contrary, other service has a continuous upward growth trends since 2001-02 with slight ups and downs. Trade/hotel has almost similar trends till 2011-12 and it showed sudden decline in the growth rate after 2011-12. The similar growth trends is found for the public admin and finance sector. However, there is a significantly upward movement of growth rates for finance sector between 2005-06 and 2011-12. Summarily, in regime2, the growth rate of all of the sub-sectors dramatically declined after 2011-12 and gradually started increasing after 2015-16.

In terms of sectoral share of service sector, it has always recorded the highest share on in the total domestic product among all sectors in an economy. In the development process, the share of service sector goes on increasing. The largest share has been observed in both developing and developed economies as far as the service sector, after the secondary. In India too, the service sector contributes 53.89 percent and it has the highest potential for income generation. Bihar is not an exception; moreover, the share of service sector has increased substantially by 12.85 percentage points from 45.44 percent in 1993-94 to 58.99 percent in 2017-18 (figure 3.9). The graph reveals a positive direction for all sectors except public admin. Public admin contributed on an average of only 6.17 percent over the years, while a decline of 2.45 percent has been observed from 7.02 percent in 1993-94 to 4.57 percent in 2017-18. In addition, public admin is the third-highest contributor in tertiary sector in 1993-94 that further declined to the least contributor in 2017-18. A sharp decline can be observed since 2009-10 for public admin, while an almost stable share with an average share of 6.92 percent is recorded in period1.

Figure 3.9 Share of the components of Tertiary sector in gross state domestic product



Sources: Author's construction using BI database

Apart from public admin, the share of the other services has a marginal increment by 2.06 percent from 10.11 percent (second-lowest share) in 1993-94 to 12.17 percent in 2017-18. However, the share of other services in tertiary sector has declined marginally by 1.37 percent over the years. However, the relative position of other services regarding contribution in tertiary sector remained stable over the years. Overall, on average, the other services contributed 10.89 percent to domestic product. The average share for other services is below 10 percent only after 2011-12. The share of finance sector is the highest among sectors in 1993-94, which dropped down to second highest in 2017-18. However, the share of the sector remained steady from 2005-06 until 2014-15, hovered around 15.00 percent. It declined since 2014-15, falling below that of the trade/hotel in 2017-18. One of the fastest growth in the share could be observed for trade/hotel, where the share has increased by 6.83 percentage points from 11.35 in 1993-94 to 18.18 percent in 2017-18. Therefore, the contribution of the trade/hotel (31.19) is the highest among the tertiary sector in 2017-18 too, while the average share is also highest over the years with an average share of 17.59 percent in between 2011-12 and 2017-18. The second-fastest-growing sector is transport, where the share is the least in 1993-94 and crossed the equivalent share of public admin in 2009-10. In addition, the share of transport remained stable till 2008-09, which gradually peeped up after 2008-09. Therefore, the maximum average share is observed by 9.40 percent, while on average, transport contributed 6.48 percent from 1993-94 to 2017-18.

3.3.4 Taking all Sectors Together

A Simply graphical analysis of either growth rate or share in the magnitude and trends does not provide an idea of its significance. Therefore, the significance level of the parameters can be

checked through several statistical tools. We have used the t-test and Levene's test for both the sectoral share and growth rate for the identified regimes. The t-test has been used to understand whether the changes in growth rate or share were significant or not. In contrast, Levene's test has been used to check the homogeneity of the variances for both growth rate and sectoral share in each regime and period. To do so, the significance level using t-test and Levene's test has been performed to compare the significant difference between the growth rate and share between regime1 and regime2; period1 and period2; period2 and period3; and period3 and period.

Table 3.2 presents the results of the statistical analysis for both growth rate and sectoral share of ten sub-sectors and three broad sectors. The results of the t-test in the table illustrate that for most of the sub-sectors or sectors, the changes in the share are highly statistically significant. The average growth rate of GSDP is higher in regime 2 by 3.55 percent compared to regime1 but it is not statistically significant. On the other hand, Levene's test confirms the homogeneity of variances for most of the sectors between regimes. There were significant differences in variance of the growth rate of GSDP among regime1 - regime2 at 5 percent significance level.

Considering the results of t-test, the average growth rate is higher for all sectors in regime2 compared to regime1 except construction. However, TSC is the only sub-sector in tertiary sector found to have a significantly higher growth rate in regime 2 compared to regime 1 at 1 percent level of significance. This is why the tertiary sector also has a significantly higher growth rate but at 5 percent level of significance. On the contrary, all the sectors have statistically significant changes in the share except mining and manufacturing between regime1 and regime2. As we have discussed, the primary sector has the highest significant decline by 11.52 percent in regime2, while construction in the secondary sector and trade/hotel, transport and finance in tertiary sector has a statistically significant higher share in regime2 compared to regime1.

Considering between two periods, the average growth rate of GSDP is significantly higher in period3 only by 8.42 percent compared to period 2 at 10 percent level of significance. In comparison, a significant decline of 5.05 percent has been observed in period compared to period3 at 10 percent level of significance. An insignificant drop in growth rate is recorded between period 1 and period 2, while an opposite trend is seen between regime1 and regime2. On the other hand, Levene's test confirms the homogeneity of variances for most of the sectors between regimes and

periods. There are significant differences in variance of the growth rate of GSDP among regime1 - regime2, period2 - period3, and period3 - period4 at 5 percent significance level.

The most debatable period is period3 where the average growth is the highest among all periods and many sectors has recorded more than 20 percent growth rate. It is evident that the average growth rate is higher in period3 compared to period2. Still, only transport has a statistically significant higher growth rate at 5 percent level of significance, leading to a significant difference for the tertiary sector. On the contrary, the changes in the average share between period2 and period3 are highly significant for all sectors except mining and manufacturing. Surprisingly, the change in the share is not statistically significant for tertiary sector; it is because of the significant decline in the share of two sectors in tertiary sector namely- public admin and other services. In the secondary sector, construction has only significant higher share in period3 compared to period2, while electricity has significant decline in the share. The highest significant reduction in the share by 5.84 percentage points is for primary sector only.

Table 3.2 Statistical test among periods and regimes using growth rate and sectoral share

Sl. No	Sectors	Growth rate				Share			
		Regimes 1 & 2	Period 1 &2	Period 2 & 3	Period 3 & 4	Regimes 1 & 2	Period 1 &2	Period 2 & 3	Period 3 & 4
Two-sample t-test									
1.1	Agriculture	2.01	-9.28	10.33	-5.83	-11.59***	-5.41***	-5.78***	-4.96***
1.2	Mining	36.05	-22.4	6.32	85.58	0.08	0.02	-0.05	0.25**
1	Primary	2.01	-9.42	10.43	-5.86	-11.52***	-5.4***	-5.84***	-4.72***
2.1	Manufacturing	10.95	-7.25	10.39	9.57	-0.51	-1.55*	-0.12	1.13
2.2	Electricity	0.89	-13.56	9.79	-1.99	-0.4***	-0.34**	-0.16***	-0.05
2.3	Construction	-2.39	7.67	2.13	-17.98***	6.14***	2.12***	4.5***	0.67
2	Secondary	4.86	-1.81	9.67	-7.5	5.23***	0.22	4.23***	1.75
3.1	Trade/hotel	1.72	0.64	5.19	-7.68*	4.63***	3.53***	2.41***	0.09
3.2	Transport	7.47***	-2.98	11.51**	-4.61	2.64***	0.18	0.97**	3.12***
3.3	Finance	1.18	-0.82	5.16	-6.99***	1.42***	1.03*	0.91**	-0.24
3.4	Public admin	0.64	-3.15	5.15	-5.34	-1.53***	-0.04	-0.93***	-1.16***
3.5	Other service	2.4	-5.92	3.5	4.72*	-0.88**	0.47	-1.75***	1.16***
3	Tertiary	3.07**	-1.29	6.01***	-4.29***	6.28***	5.18***	1.61	2.97***
1+2+3	GSDP	3.55	-4.02	8.42*	-5.05*				
Levene's test									
1.1	Agriculture	12.45***	0.76	1.02	3.6	0.65	0.81	1.09	1.77
1.2	Mining	3.24*	0.01	0.72	7.17**	8.14***	2.89	5.57**	33.47***
1	Primary	12.88***	0.96	0.86	4.49	0.87	0.74	1	2.02
2.1	Manufacturing	0.18	4.23*	5.91**	3.49**	0.02	6.45**	4.73*	3.66*
2.2	Electricity	4.88**	0.28	3.69*	1.17	48.89***	4.53*	0	1.07
2.3	Construction	0.77	0.01	0.85	1.02	0.1	4.57*	2.12	18.59***
2	Secondary	1.7	3.13	0.23	1.29	1.52	2.31	2.03	0.05
3.1	Trade/hotel	4.12*	0.36	6.61**	2.99	13.23***	2.48	1.25	0.15
3.2	Transport	0.19	9.48**	0.17	0.35	40.84***	0.41	21.63***	0.37
3.3	Finance	3.61*	0.12	5.32**	3.73*	1.77	1.33	1.86	3.03
3.4	Public admin	0.25	1.61	0.38	0.47	4.67**	0.56	2.48	0.23
3.5	Other service	1.03	1.27	1.38	1.25	0.32	1.9	0.02	0.07
3	Tertiary	1.22	2.00	1.51	3.42*	3.22*	0.47	0.09	1.96
1+2+3	GSDP	6.52**	0.00	6.5**	7.59**				

Sources: Author's estimation

Moreover, the statistical analysis - Levene's test of the sectors presented in table 3.2 confirms the homogeneity of variances for most of the sectors between regimes and the periods. There are significant differences in variance of the growth rate of GSDP among regime1 - regime2 at 5 percent significance level. Agriculture is the only sector among all sectors that has a statistically significant difference in the variance between regime1 and regime2 at 1 percent level of significance. The variance is heterogeneous for electricity too at 5 percent level of significance, while Mining, trade/hotel and finance were at 10 percent level of significance. In the case of sectoral share, the variance is statistically different for only four sectors: mining, electricity, trade/hotel, and transport at 1 percent level of significance; and public admin at 5 percent significance level. Overall, the statistical analysis of growth and sectoral share of the sectors between several periods indicates that the changes in sectoral share are highly significant between period2 and period 3 for almost all sectors, on the other hand, only transport sector has significantly higher growth in period 3. This result shows that there is significant restructuring has happened in terms of sectoral share in Bihar without statistically significant changes in the sectoral growth.

3.4 Sectoral Contribution to Output Growth

This section deals with the decomposition of growth rate of gross state domestic product in Bihar. The methods for growth decomposition have been briefly discussed in the data and methodology section. The main objective behind doing this exercise is to find the role of the sectors in the overall growth of the state. Therefore, the contribution/share of the sectors/sub-sectors has been analysed in the growth rate of the gross state domestic product through growth decomposition. Later in this section, the contribution of sectors has also analysed in the change in the growth rate (compound growth rate) of the GSDP for the regimes.

Table 3.3 presents the results of growth decomposition for the sectors over regimes and several periods including the growth decomposition for the average growth rate from 1993-94 to 2017-18. In the results, the residual term denotes the difference between the actual GSDP growth rate and the sum of the contribution of sectors in the growth rate. It is explicit that the tertiary sector contributed most to growth rate with an increase in growth-share by 6.93 percentage points from 54.40 percent in 1993-2001 to 61.33 percent in 2012--18. On the other hand, a decline by 5.88 percentage points is recorded for the tertiary sector between regime1 (1993-05) and regime2 (2006-17). A significant change by 26.77 percentage points can be observed for the secondary sector, while primary sector has recorded a decline in the contribution of growth in GSDP by 30.80 percentage points over the period (1993-2017).

Table 3.3 Contribution of sectors in the growth rate of the GSDP (in growth percentage).

Sl. No.	Sectors	1993-94/ 2000-01	2001-02/ 2005-06	2006-07/ 2011-12	2012-13/ 2017-18	1993-94/ 2005-06	2006-07/ 2017-18	1993-94/ 2017-18
1	Primary	2.03	0.34	1.26	0.25	0.59	0.87	1.03
2	Secondary	0.63	1.06	2.63	2.21	0.65	1.93	1.23
3	Tertiary	3.15	2.42	5.83	3.60	2.89	4.68	3.79
4	GSDP	5.79	3.87	9.55	5.87	4.16	7.36	6.08
5	Residual	-0.02	0.04	-0.18	-0.20	0.03	-0.12	0.02
6	Agriculture	2.01	0.41	1.25	0.24	0.58	0.85	1.02
7	Mining	0.02	-0.03	0.01	0.03	0.01	0.02	0.01
8	Manufacturing	0.14	0.09	0.67	2.04	0.06	0.85	0.44
9	Electricity	0.23	0.05	0.13	0.07	0.10	0.11	0.10
10	Construction	0.27	0.94	1.83	0.44	0.46	0.97	0.79
11	Trade/hotel	0.72	1.11	2.11	0.95	0.89	1.49	1.24
12	Transport	0.35	0.25	0.99	0.91	0.29	1.01	0.59
13	Finance	0.84	0.72	1.60	0.55	0.82	1.02	0.94
14	Public admin	0.37	0.02	0.51	0.13	0.26	0.26	0.26
15	Other services	0.88	0.36	0.65	1.10	0.63	0.92	0.75
16	GSDP	5.79	3.87	9.55	5.87	4.16	7.36	6.08
17	Residual	-0.04	-0.05	-0.19	-0.60	0.07	-0.14	-0.07

Source: Author's computation

Now, analysing the growth-share by sub-sector wise, at least five sectors have contributed more than 80 percent of the gross state domestic product growth in any period. In addition, over the study period, only two sectors namely Trade/hotel and finance were among the top of the five sectors that contributed consistently in any period. The contribution of finance is always greater than 10 percent except in the period of 2012-13 to 2017-18 ([appendix Table A3.1](#)). One of the emerging sectors, namely transport has continuous positive trend over the period and placed among the top five contributors since 2006-07. A drastic change in the contribution can be seen for manufacturing sector in the later periods, where the contribution of manufacturing is the highest, which has never crossed 10 percent contribution in previous periods. Surprisingly, contribution of construction is highest in 2001-02 to 2005-06, while its growth rate is highest in 2005-06 to 2011-12. This is due to lower growth rate in period 2 compared to period 3. In addition, it is evident that the contribution of the top five sectors in regime1 namely – agriculture, construction, trade/hotel, finance and other service have contributed more than 80 percent of the growth in domestic product fell to 71.33 percent in regime2. The decline in the growth-share is observed due to the decline in all sectors except construction. On the other hand, growth-share of the manufacturing and transport sectors significantly increased in regime2. Overall, the data

analysis confirms that tertiary sector always has the highest share in growth in GSDP followed by secondary and primary sector except the lowest growth share for secondary sector in period 1. Further disaggregated analysis revealed that trade/hotel and finance sectors has the major role in high growth phase in Bihar followed by construction and transport sectors.

3.5 Determinants of the Economic Growth in Bihar

3.5.1 The Role of Capital formation

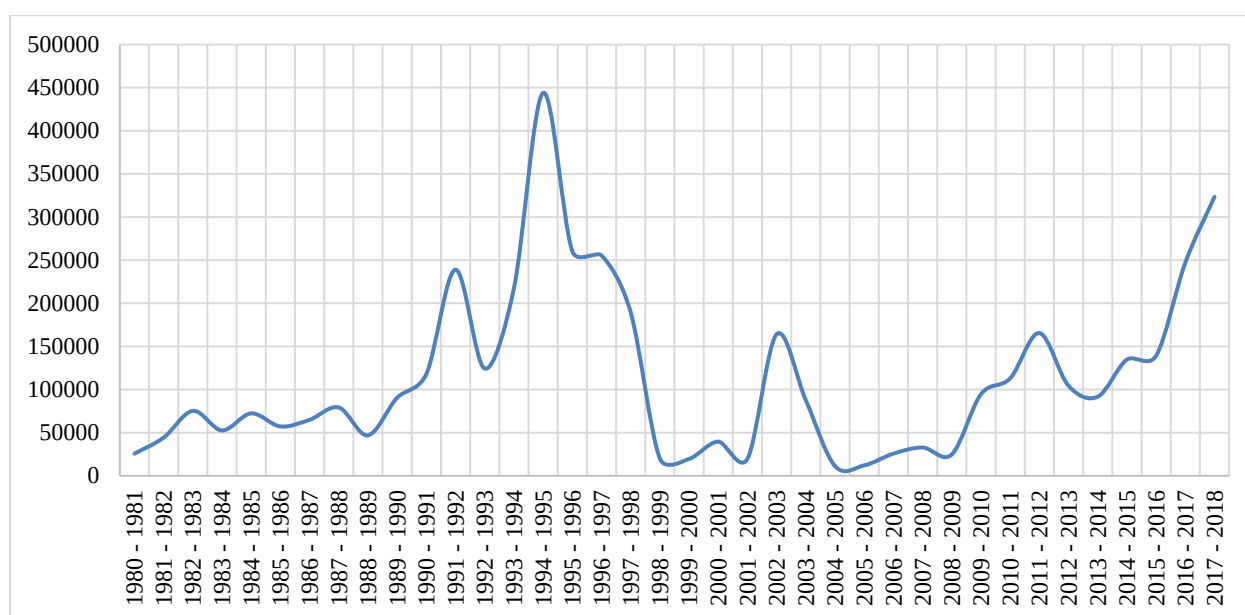
The positive role of capital formation and economic growth is widely acknowledged by several scholars (Chow, 1993; Kanu et al., 2014; Uneze, 2013). Uneze (2013) studied 13 sub-Saharan African countries and find cointegrating relationship between capital formation and economic growth along with bi-direction causality between capital formation and economic growth in short and long run. In another study by Kanu et al., (2014) find similar results in case of Nigerian economic growth. The essence of these studies are Low level of capital formation restricts the growth rate of any economy, therefore investment is key to economic growth (Collier & Gunning, 1999). Bihar is characterized as one of the underdeveloped state in India with low level of capital formation and investment rate. However, in the light of recent growth rate, it is expected to have some positive impact of capital formation in the economic growth of Bihar.

In a recent study by Pandey & Kumari (2021) find the use of fertilizer per hectare, cropping intensity and capital formation have driven agriculture growth in Bihar. This results also supports our analysis with the higher growth rate of agriculture sector in the growth periods and its positive impact on the growth of other sectors due to interlinkages among the sectors (Pandey & Kumari, 2021). The data on Capital formation has been obtained from database on Indian states, Reserve Bank of India. The unavailability of the official data on other macroeconomic aggregate (such as – saving rates, public and private investment etc. sector-wise capital formation) limits us to any rigorous econometric exercise at state level (Joe, Kumar & Rajpal, 2018; Sinha & Sinha, 2020). Therefore, we have adopted residual approach to analyse the role of capital formation and technological on the productivity growth in Bihar in Chapter 5. Meanwhile, statistics obtained from RBI database for capital formation, number of factories and workers are presented in figure 3.10 and figure 3.11. The lower number of factories and workers after 1999-00 is probably due to the bifurcation of Bihar into Jharkhand. However, after bifurcation the number of factories and workers has upward trends. The similar patterns can be observed for the capital formation statistics. We have attempted to check the relationship between capital formation and economic growth with the available dataset. For that, gross state domestic product has been taken as dependent variable and other explanatory variables are number of factories and number of workers

(labour force). To check the impact of the change in the growth rate, governance_dummy has been also included onto the model where governance_dummy is described below.

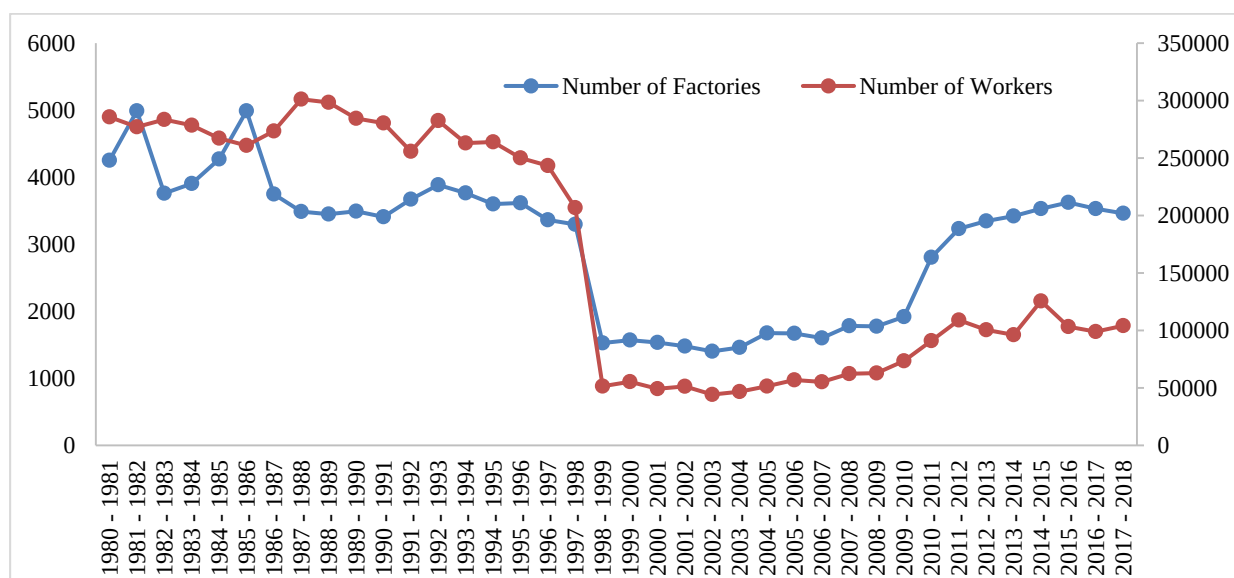
$$\text{governance_dummy} = \begin{cases} 1, & \text{if year} > 2005-06 \\ 0, & \text{otherwise} \end{cases}$$

Figure 3.10 Trends of gross fixed capital formation in Bihar, 1980-2017



Source: Annual Survey of Industries (ASI), Reserve Bank of India (RBI).

Figure 3.11 Number of factories and workers in Bihar over 1980-2018



Source: Source: Annual Survey of Industries (ASI), Reserve Bank of India (RBI). Note: 1st axis represents number of factories, while 2nd axis are for number of workers.

The general and essential procedure in any time series regression is to test for the stationarity of a time series data. This is done by unit root test which allow us to avoid misspecification of the regression model and hence the results drawn from the estimation. Table 3.4 presents the results of stationarity tests which is obtained using Augmented Dickey Fuller (ADF) test in E-views statistical software. As another characteristic of the time series data is to take the logarithmic form of the data to avoid the non-normality. Therefore, all of the variables specified in the table are firstly converted into logarithmic form and then the ADF unit root test was performed. If the tests indicate that some variables aren't stationary at level, it means that they were integrated of first order, and the first difference of the data were taken for stationarity test. The null hypothesis of the ADF test characterizes the series as non-stationary or unit root process. This hypothesis is accepted if p-value associated to the statistic of the test is higher than five percent.

Table 3.4 Unit root test (Augmented Dickey-Fuller test)

Variables	Level		First-Difference		Inference
	Intercept	Intercept & trend	Intercept	Intercept & trend	
Ln_GSDP	0.845 (0.993)	-1.317 (0.865)	-3.126*** (0.034)	-3.266*** (0.090)	I(1)
Ln_GFCF	-2.616 (0.099)	-2.593 (0.286)	-6.539*** (0.000)	-6.454*** (0.000)	I(1)
Ln_worker	-1.288 (0.625)	-1.210 (0.894)	-5.627*** (0.000)	-5.603*** (0.000)	I(1)
Ln_factory	-1.432 (0.556)	-1.047 (0.925)	-5.779*** (0.000)	-6.009*** (0.000)	I(1)

Note: Ln= log form of variable; GSDP= Gross State Domestic Product; GFCF=Gross Fixed Capital Formation; worker= Number of Workers; factory= Number of Factories; probabilities are in brackets; *** significant at 1 percent.

The stationarity test for variables shows that the all of the variables were non-stationary at the level taking both intercept and trends and intercept. Therefore, we have first-differenced the time series data and found that the all of the variables became stationary after the first-difference at both intercept and trends and intercept. We have taken the variables and run several regression to establish the relations between capital formation and gross state domestic product.

Table 3.5 Regression result (Dependent variable = Gross State Domestic Product)

Variables	Ln of GSDP (Model 1)		Ln of GSDP (Model 2)	
	Coeff.	P-Value	Coeff.	P-Value
Ln of Gross fixed capital formation	0.524*** (0.121)	0.000	0.494*** (0.087)	0.000
Ln of Number of Factories	2.675*** (0.542)	0.000	0.959* (0.492)	0.060
Ln of Number of Workers	-2.794*** (0.282)	0.000	-1.581*** (0.293)	0.000
Governance			1.157*** (0.203)	0.000
Constant	21.154*** (1.854)	0.000	20.427*** (1.334)	0.000
R- squared	0.816		0.909	
Adj. R-squared	0.800		0.897	
F-statistics	48.870	0.000	79.550	0.000
Number of Obs.	37		37	

Source: Author's estimation, Note: ***significant at 1 percent, **significant at 5 percent, *significant at 10 percent. Standard errors are in brackets.

The ordinary least square (OLS) regression results shows that the explanatory variables such as GFCF and number of factories have coefficients with a positive sign, implying a positive contribution to the economic growth in Bihar. On the other hand, the negative sign of the coefficient for number of workers indicate inverse relationship with economic growth also known as jobless growth. The selected explanatory variables with governance dummy explains 90 percent of the changes in the GSDP and the P-value for the F-statistics indicates significance of the overall model at the one percent level. All of the coefficients are significant at 1 percent level of significance except number of factories. The result shows a positive relationship between capital formation and economic growth in Bihar. In addition, governance dummy indicates a significant higher growth after 2005-06 compared to the previous periods.

3.5.2 Bihar Krishi (Agriculture) Road map

There are three Bihar Krishi Road maps that has played a significant role in introducing agricultural reform in Bihar since 2008. As we have seen in the section 4.3.1 that the performance of the

primary sector is distinguishable, most probably because of the implementation of the Bihar agriculture road map. As of now, Bihar has rolled out three 'Agriculture road maps'. The first road map is introduced in 2008 and continued till 2012, the second Agriculture road map is for 2012-2017 and the third road map is implemented in the period of 2017 and 2022. The exemplary implementations of the road map has witnessed a remarkable production of rice and wheat in 2011-12 and 2012-13 respectively. Each road maps is designed with distinctive objectives¹² and has been successful in the overall progress in the agriculture sector (Kannan & Pohit, 2019). Under the ambit of these road maps, several programmes and schemes were flagged off, such as – seed extension and seed gram scheme, bio-farming and uses of modern agricultural equipments e.t.c. The road map helped in boost up the Irrigation facilities, storage facilities for food grains, agricultural power supply, export oriented crop production and also one Agriculture University and three agriculture colleges are setup to enhance the research activity in the field of agriculture sector.

3.5.3 Capital Accumulation and Expansionary Fiscal Policy

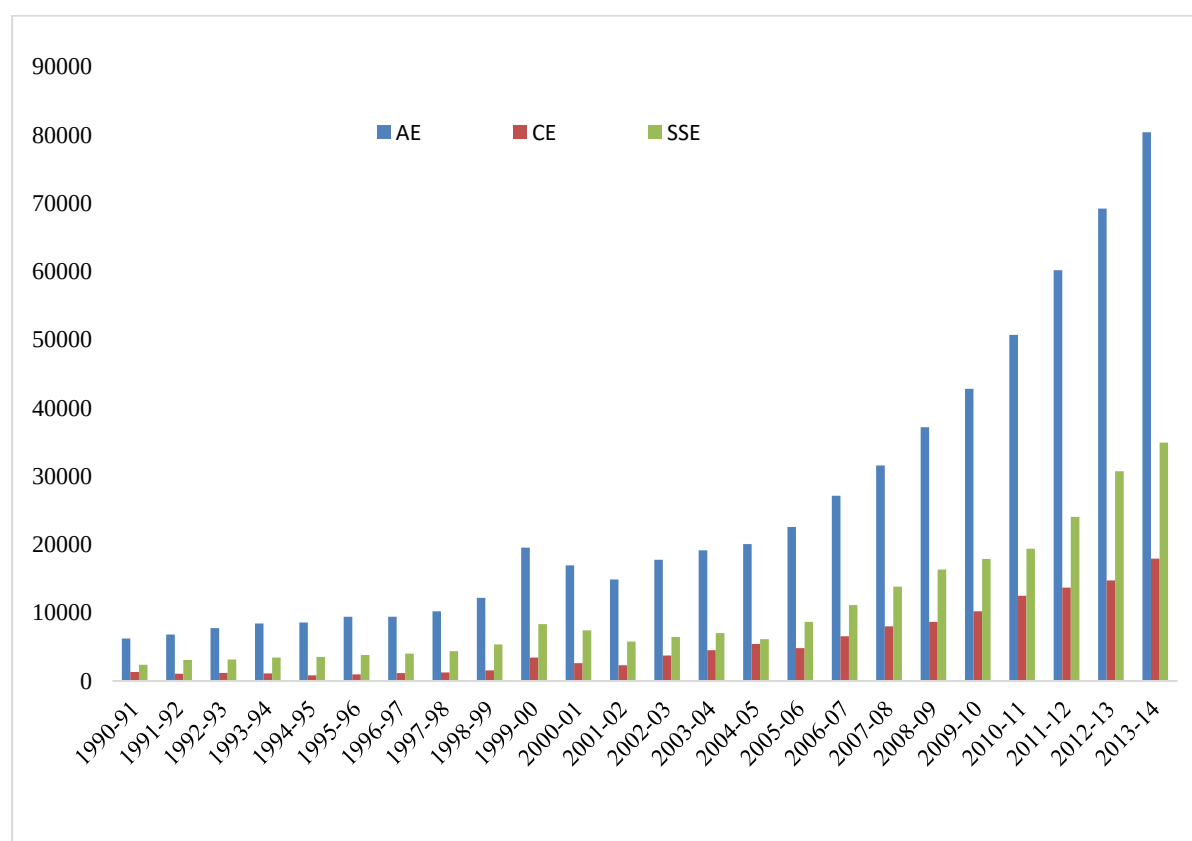
A control on the Government expenditures and receipts act as an important instrument of the fiscal policy and has a significant impact on the economic growth. Government expenditure and receipts has two prime components – revenue expenditure/receipt and capital expenditure/receipt. Government expenditure helps economy to grow in the process through capital accumulation and infrastructural development. In development of Bihar from a stagnant to growth economy, the role of capital formation and capital accumulation is evident, where the state finance is more on pro- infrastructural development. Aggregate expenditure (AE), capital expenditure (CE), and social sector expenditure (SSE) have grown at an average growth rate of 16.70%, 14.94%, and 21.76%, respectively from 2005-06 to 2013-14, which is much higher than compared to the earlier period of 1999-00 to 2004-05 (figure 3.10). That is why the construction sector and service sectors have commendable growth rate and also contribution to the overall economic growth of Bihar.

In an industrialised countries, changes in the standard of living depend primarily on the development of new technology and capital accumulation. In developing economies, the development of well-functioning infrastructure is more important than the new technology,

¹² The common objectives are – a) food security, b) Nutrition security, c) Increase in the income of the farmers, d) Employment generation and control on migration of workers; e) Inclusive human base of agricultural development and extensive participation of women; and f) Conservation of natural resources and their sustainable use.

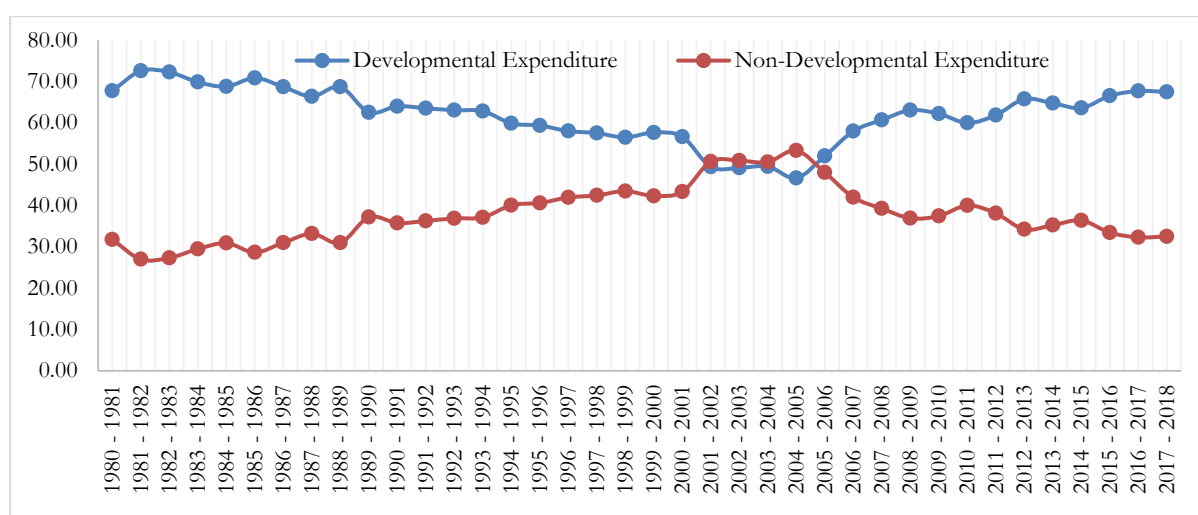
because the later can be imported. Therefore, In Bihar, it is witnessed that the major portion of the expenditure is on infrastructure developmental spending compared to the non-developmental expenditure in the growth period. Figure 3.11 shows the trends of the ratio of development and non-developmental expenditure in total state expenditure in Bihar. It explicitly illustrates how the trends have reversed since 2005-06. The development expenditures continuously fell in the pre-reform periods compared to a rising non-development expenditure. The five-year period between 2000-01 and 2004-05 is a period of stagnation where the development and non-development expenditure were equally distributed. Further, the growth rate in the development expenditure is much higher after 2005-06 compared to the previous periods. The major share of development expenditure is carried on the infrastructural development such as – roads, bridges, and power sectors.

Figure 3.10 Trend of capital expenditure, social sector expenditure and aggregate expenditure in Bihar.



Source: Author's construction using state finance data. Note: AE = Aggregate Expenditure, CE= Capital Expenditure, and SSE= Social Sector Expenditure.

Figure 3.11 Trends of developmental and non-developmental expenditure in Bihar



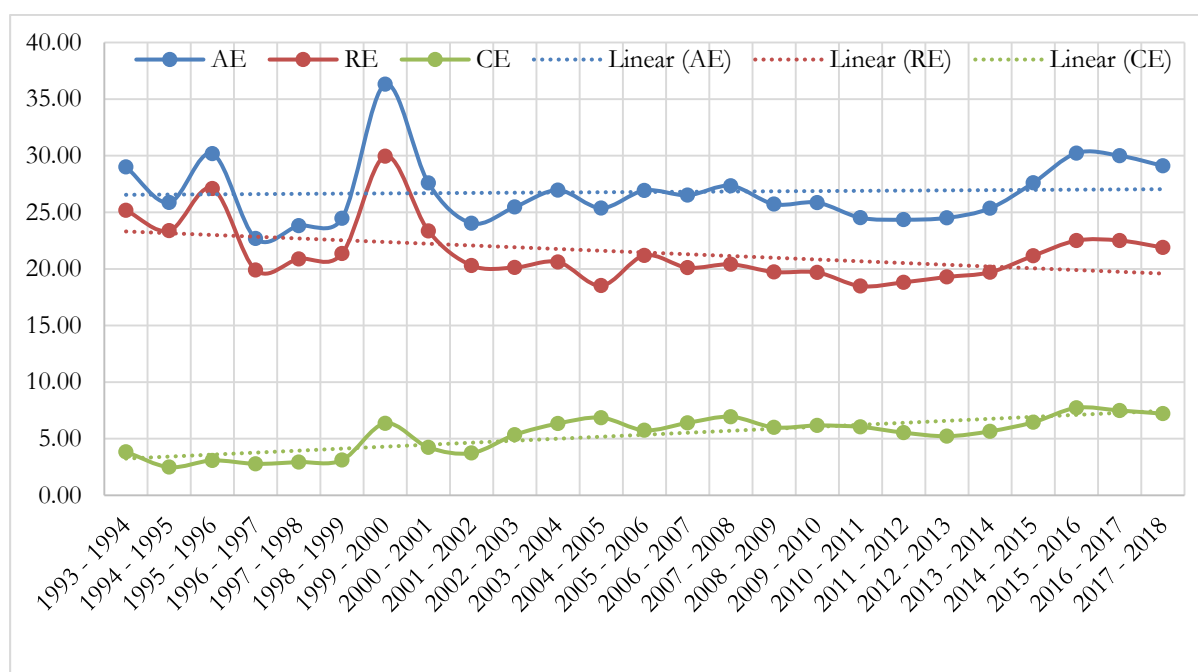
Source: Author's construction using state finance data.

Table 3.5: Average share of the variables in gross state domestic product (In %)

Periods	Aggregate Expenditure	Revenue Expenditure	Capital Expenditure
1993-94 to 2000-01	27.49	23.89	3.6
2001-02 to 2005-06	25.75	20.15	5.6
2006-07 to 2011-12	25.72	19.54	6.18
2012-13 to 2017-18	27.8	21.18	6.63

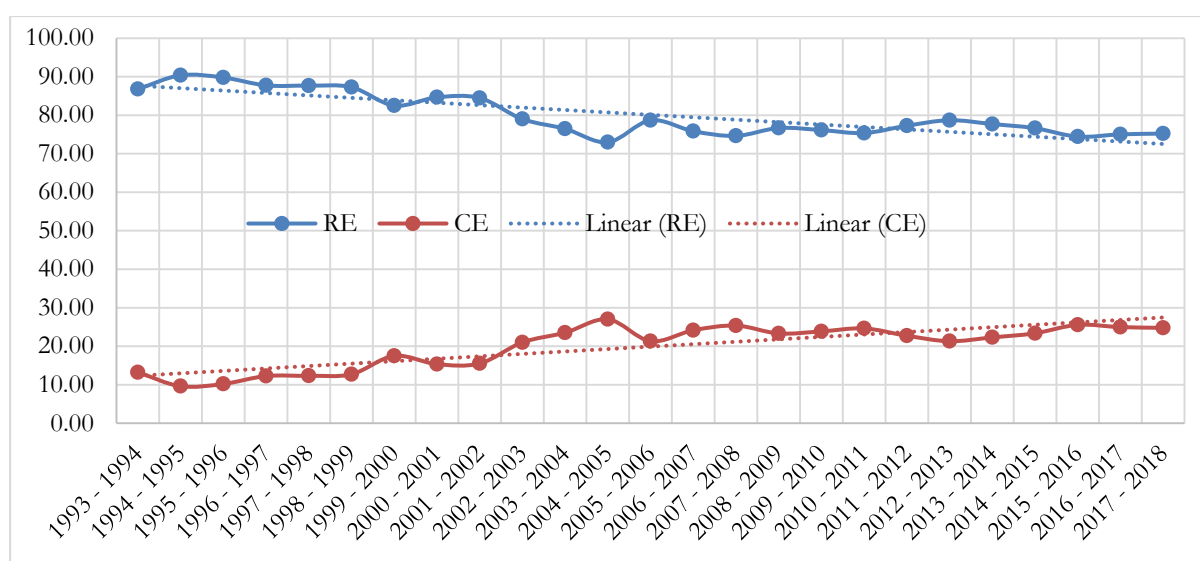
Source: Author's construction using state finance data.

Figure 3.12 Trends of government expenditure as a % share of State domestic product



Sources: Author's construction using RBI database

Figure 3.13 Share of revenue and capital expenditure in aggregate expenditure



Sources: Author's construction using RBI database

Considering the period wise analysis of the expenditure, table 3.5 shows that the share of the aggregate expenditure is highest in period 2012-13 to 2017-18, while the lowest share is observed in period 2006-07 to 2011-12. On the contrary, revenue expenditure has the highest share in 1993-94 to 2000-01 and the lowest is recorded in 2006-07 to 2011-12. Considering the capital expenditure, the maximum capital expenditure is recorded by 6.63% in 2012-3 to 2017-18 followed by the previous periods. The trends of the component of the expenditure in SDP share are presented in figure 3.12 also witnessed an increase in the capital expenditure over the periods. However, for both aggregate and revenue expenditure there are in declining trend over the periods. Almost similar trends are witnessed with the share of the revenue and capital expenditure in the aggregate expenditure, shown in figure 3.13.

3.5.4 Government Receipts/Revenue

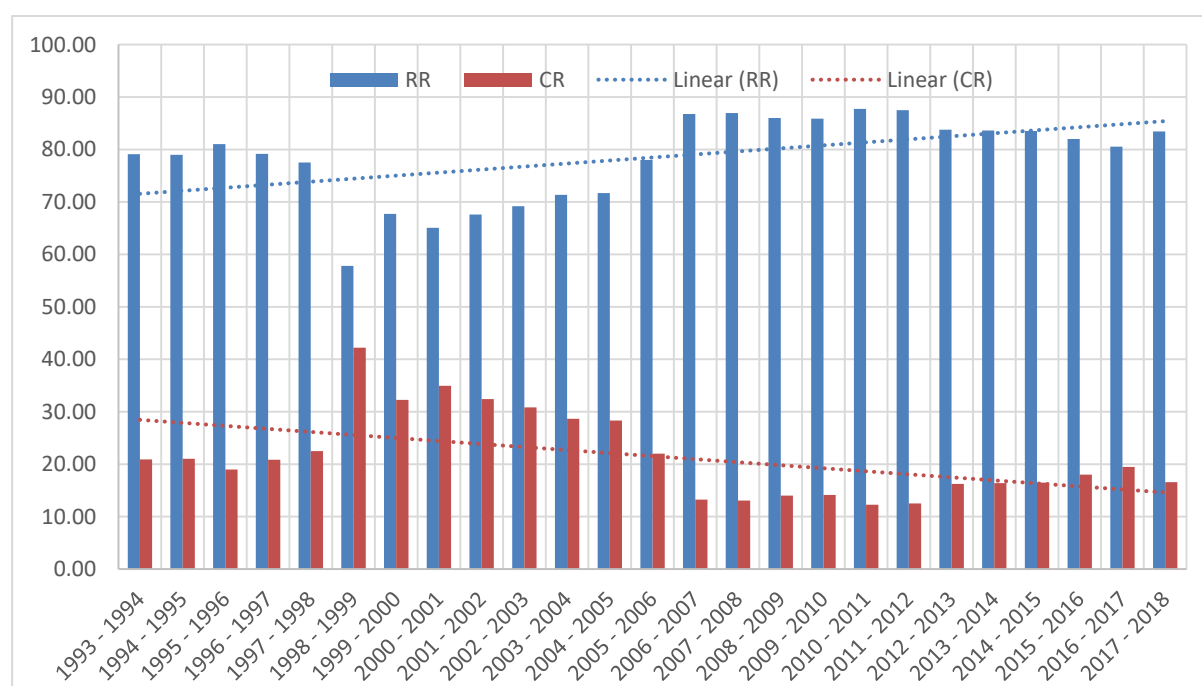
The major sources of earnings of a state comes from tax and non-tax revenues, loans and debts from internal and externals sources. The loans and debts are known as liabilities while the tax and non-tax revenues are the part of government receipts. In Bihar, the first period 1993-94 to 2000-01 has the highest receipt of the government compared to the state GDP which is followed by the last period, 2012-13 to 2017-18. In the period of high growth of GSDP in Bihar, government receipt including capital receipt is the lowest (table 3.6). On the other hand, the state liabilities is also declining after 2001-02 along with the capital receipt, as shown in figure 3.14. Growth in the revenue receipt has started in period 2000-01 which further is increasing and stabilised after 2005-06.

Table 3.6 Period-wise average share of government receipts in SDP (In %)

Periods	Aggregate Receipt	Revenue Receipt	Capital Receipt	Liabilities
1993-94 to 2000-01	28.74	20.9	7.84	53.81
2001-02 to 2005-06	26.03	18.67	7.37	55.5
2006-07 to 2011-12	25.65	22.26	3.39	37.87
2012-13 to 2017-18	28.54	23.62	4.93	30.4

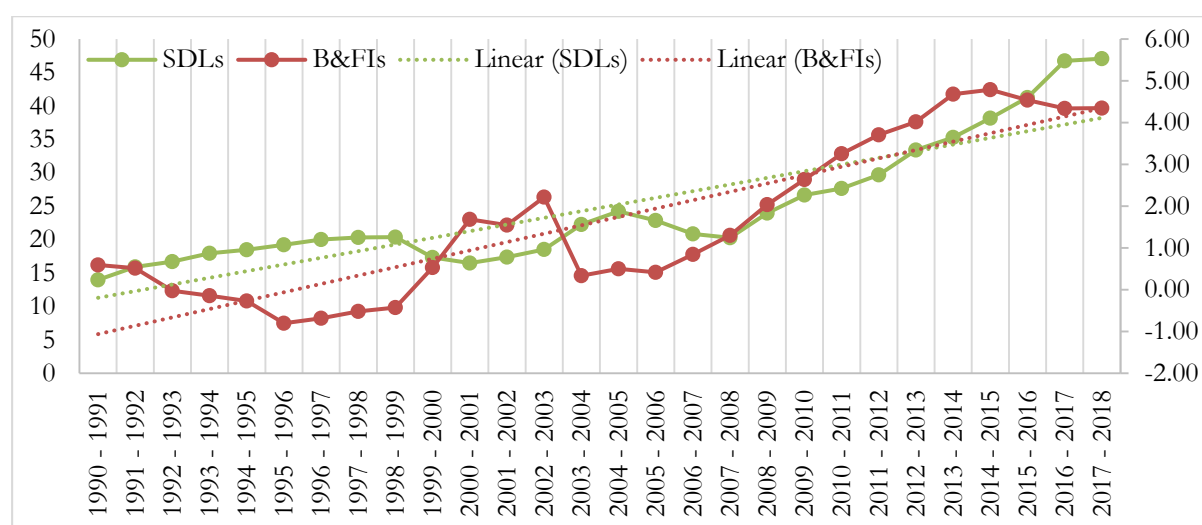
Source: Author's estimation

Figure 3.14 Share of revenue receipt and capital receipt in aggregate receipt



Source: Author's construction

Figure 3.15 Trends of various liabilities of the state government



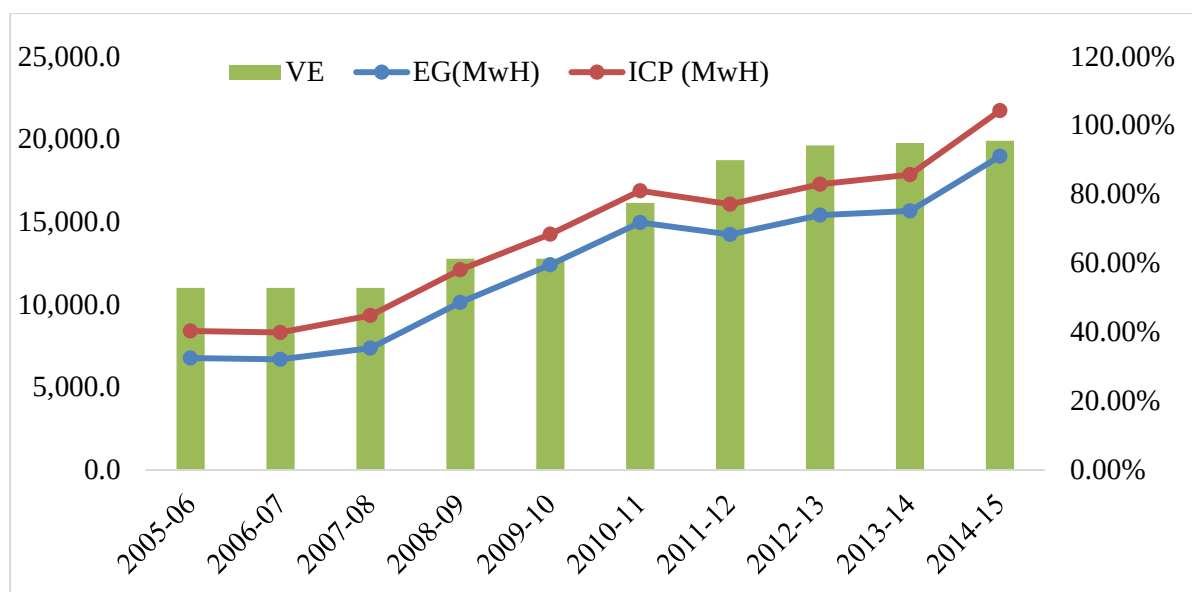
Source: Author's construction

Despite a decline in the share of liabilities in the SDP, the share of State development loans and loans from the bank and financial institutions in the total liabilities of the state has increased especially after 2005-06 (figure 3.15). An increase in the liabilities has a direct effect on the government expenditure and also it helps in increasing the state revenues in the process of development.

3.5.5 Infrastructure Development: Road, Bridges, Energy

In the case of infrastructure development, a total of 1723 mega, major & minor bridges were completed during the period from 2005-06 to 2015-16, in which alone 1013 major and minor bridges were built under Mukhyamantri Setu Nirman Yojana. The extension of roads in national and state highways with major district roads is prominent. The length of the National Highway increased from 3410 km in 2001 to 4595km in 2015. In addition, the state highway increased from 2383km in 2011 to 4253km in 2015. Also, the major district roads have been built from 7739 km in 2001 to 10634 km in 2015 (Economic Survey, 2017-18). Therefore, it is observed that infrastructural development is at the top of priority after 2005-06. In the pre-reform periods, the current governments were failed to channelise the central pool in the state, which is well executed after 2005-06 (Sinha, 2011).

Figure 3.16 Trend of village electrified, electricity generation and installed power



Source: Author's construction using Niti Aayog data. Note: VE= Village Electrified, EG= Electricity Generation, ICP= Installed capacity of power

A manifold increase in the number of registered vehicles can be seen as a result of expanding roads and bridges and efficient connectivity between urban and rural regions. Another major change in terms of infrastructural investment is in the power sector, where almost 45.12 percent of households were electrified up to 2017 with an increase from 52.83% of village electrification

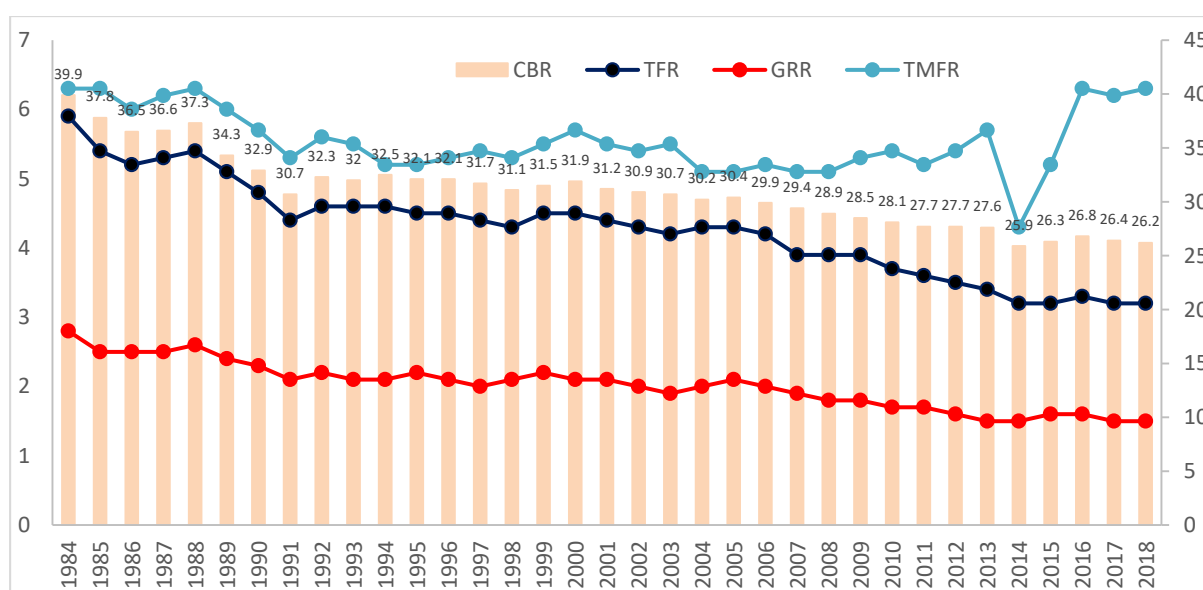
(VE) in 2005-06 to 95.50% in 2014-15 (Economic survey, 2015-16). Figure 3.16 shows the growth of village electrification and power capacity in the present government. It shows a continuous increase in all parameters that make the state efficient in the power sector. There is an annual average growth rate of 12.6 percent and 7.0 percent of electricity generation (EG) and installation of the capacity of power (ICP) respectively after 2005-06.

3.5.6 Demographic Changes

Considering the demographic structure, a decline in the total fertility rate (TFR), infant mortality rate, and an increase in life expectancy at birth are expected in economic development. A Higher Infant mortality rate is associated with a lower life expectancy because the probability of death in infancy is often higher. Therefore, the proportion of the child population declines, and the proportion of the old-aged population increases with time. To measure the demographic structure and health status, we have several other demographic indicators such as – child death ratio (CDR), child birth ratio (CBR), infant mortality ratio, gross reproductive rate (GRR), the total marital fertility rate (TMFR), etc. However, the values of these demographic parameters differ between rural and urban regions due to the differences in the available health infrastructure. This is why the population growth rates also differ across regions.

The bar and line graph presented in figure 3.17 shows the trends of several health indicators from 1984 to 2018. The right-hand side vertical axis represents the figures for crude Birth Rate (CBR), and the left side vertical axis represents figures for the rest of the demographic indicators. It is evident that birth rate and fertility rate decline due to improved health infrastructure and fertility awareness. The same is evident in the case of Bihar, where there is a significant decline in the various demographic indicators in late 2010 except total maternal fertility rate (TMFR). The performance of these demographic indicators can be linked with the population growth as we see a sharp decline in the indicators between 1984 and 1991. Therefore, the decadal population growth rate has declined in this period. In the next decade of 1991 and 2001, an increase in the demographic indicators led to a phenomenal rise in the population. Further, the decadal population growth rate declined by 3.01 percentage points over the period of 2001-11 due to the decline in the demographic indicators in this period. (Mukherji & Mukherji, 2015). An estimate carried out by NFHS data and SRS also confirmed the similar trends for these several demographic indicators in respect of Bihar.

Figure 3.17 Trend of several health indicators from 1990 to 2016



Source: Source: Author's Computation, data taken from Niti Aayog; CBR= Crude Birth rate, TFR= Total fertility rate, GRR= Gross reproduction rate, TMFR= Total Maternal Fertility rate

Table 3.7 Life Expectancy 1981-85 to 2011-16 (years)

Period	Male		Female	
	Bihar	India	Bihar	India
1981-1985	54.2	55.4	51.5	55.7
1992-1995	60.2	60.1	58.2	61.4
1999-2003	61.6	61.8	59.7	63.8
2002-2006	62.2	62.6	60.4	64.2
2011-2016	69.9	70.0	69.1	71.1

Source: SRS data, 2011, Census of India., Mukherji & Mukherji

One of the major impacts of such improvements in the indicators is the rise in the standard of living with life expectancy, as shown in [table 3.7](#) that the life expectancy has improved by many points over the periods. In comparison to all India level, there is a minimal difference in the life expectancy for Bihar. However, at the gender-based segregation, Bihar has a different trend than all India level. Females have lower life expectancy than men in Bihar, but it is reversed at the India level. During 1981-85, life expectancy at birth among males is 54.2 years in Bihar, while it is 55.4 years in India. Among females, however, life expectancy at birth is 55.7 in India, while in Bihar, it is 51.5 years.

Nonetheless, the life expectancy among females in Bihar have improved significantly by the addition of 17.6 years during 1981-2016, which is higher than the all India level and compared to among males in Bihar. The social sector has been highly focused after 2005, with a significant increase in its allocation for expenditure in health and education. In addition, JEEVIKA - Under

the national rural livelihood Programme has been continuously working for poverty alleviation and maintenance of the standard of living for the rural population. Apart from improvements in the health indices, changes in education structure are also important to look at in terms of human capital. Therefore, the next section briefly discusses the changes in Bihar's education sector.

3.5.7 Human Capital Investment

Education is one of the major components in the human Development index to measure the human capital and development of an economy. Unfortunately, Bihar is at the lowest place among the states of India in terms of literacy rate. However, Bihar's position has improved in the recent decade. Table 3.8 shows the literacy rates in Bihar and India since 1951. It indicates that the literacy rate in Bihar has significantly improved from 47.5 percent in 2001 to 63.8 percent in 2011. The literacy rate among females increased by 53.27 percent between 2001 and 2011 compared to only 18 percent increase among males. In terms of literacy rate, the performance of Bihar is much better than all India level. In addition, the rate of increment in the literacy rate is also higher since 2001 than in the previous decades. The increased participation of males and females in the education system played a key role in increments in the literacy rate. The increment in the enrolment ratios is observed in both school and higher education in the state. As shown in figure 3.18, there is a sharp rise in the enrolment ratios for boys and girls in the school education system after 2003-04.

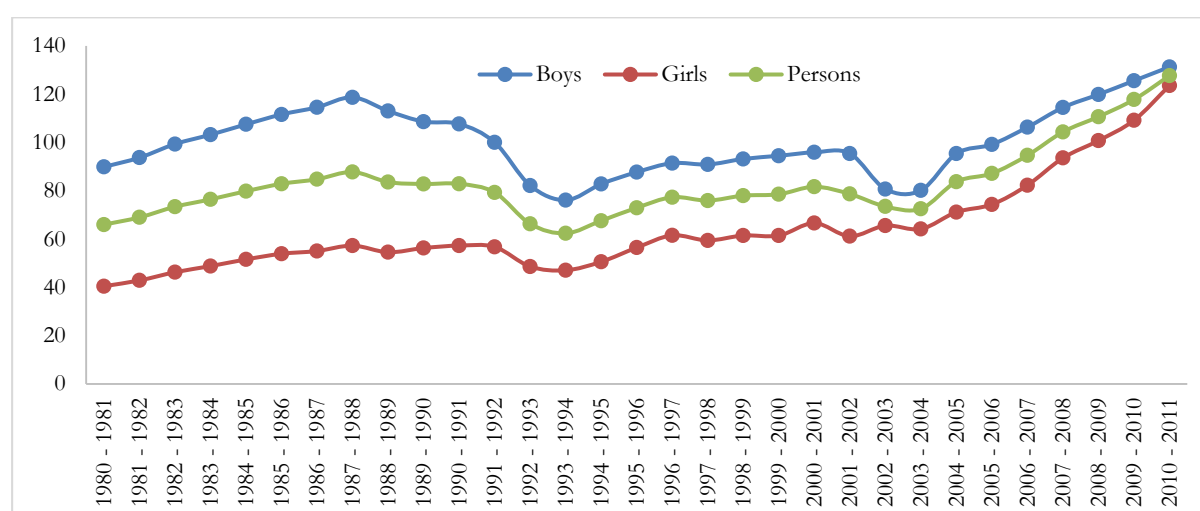
Simultaneously, the gap between boys and girls were declined over the periods. However, the access to education for both boys and girls is near stagnation until 2003-04 in the post-reform period. On the other hand, there is an increasing trend of enrolment ratio for the first half, and later it started declining in the pre-reform period (198-81 to 1993-94). Declining drop-out rates also accompanied such improvement in the literacy rate among all classes up to class XII in the state. Quite interestingly, if one looks at the access to schooling, Bihar is able to reduce the number of out-of-school children by having a larger and larger fraction of the school-going children attending government schools over the 2006–11 period. Mukherji & Mukherji (2015) pointed out that the proportion going to private schools has declined from 13.4% to 5.4%, indicating a large movement of students from private schools to the public school system. This move toward government schools is very interesting and is contrary to the national trend, where we see a sharp increase in the proportion of school-going children attending private school—from 19.6% to 25.2%.

Table 3.8 Literacy rates in Bihar and India 1951-2011 (Percentage)

Year		1951	1961	1971	1981	1991	2001	2011
Bihar	Person	13.5	22	23.2	32.3	37.5	47.5	61.8
	Male	22.7	35.9	35.9	47.1	51.4	60.3	71.2
	females	4.2	8.1	9.9	16.6	22	33.6	51.5
India	Person	18.3	28.3	34.5	43.6	52.2	64.8	74
	Male	27.2	40.4	46	56.4	64.1	75.3	82.1
	females	8.9	22	22	29.8	32.2	53.7	65.5

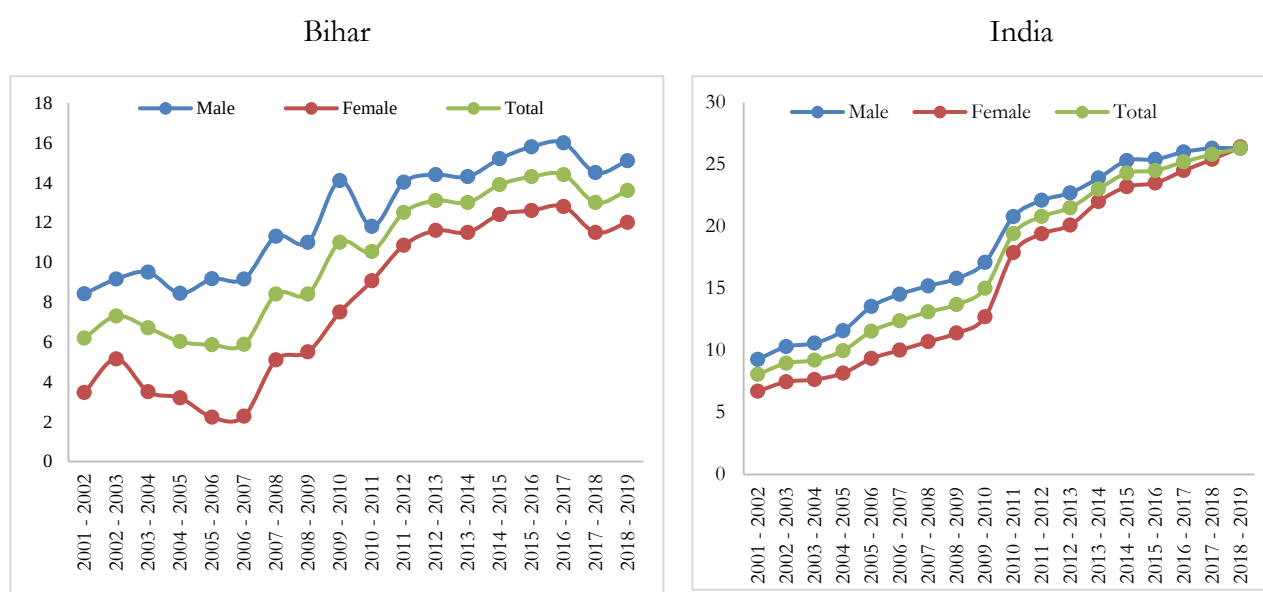
Source: Census of India.

Figure 3.18 Trends of enrolment ratios among Boys and Girls in school education



Sources: Author's construction.

Figure 3.19 Trends of enrolment ratios of male and Females in Higher education



Sources: Author's construction

Moreover, apart from school education, the male and female enrolment ratios has increased in higher education too. [Figure 3.19](#) shows the trends of enrolment ratios for males and females in higher education since 2001-02 for Bihar and India. It explicitly indicates a sharp rise in the access to higher education for both males and females in Bihar since 2006-07, compared to the increasing trends in India. In addition, the education gap between males and females is also declining through the periods due to the higher growth rate of female education compared to males. On the other hand, the enrolment in higher education is declining before 2006-07. The decline is sharper for females than males, contrary to increasing trends for both males and females at the India level.

3.6 Conclusion

At the sectoral level, structural changes occur when the composition of income changes among the sectors over the periods. However, the structural change could be either growth-enhancing or growth-reducing depending upon the trends of the productivity level in the economy. Bihar is characterised as one of the most underdeveloped states in India due to the poor growth rates historically and has the least scores in the development parameters. In recent decades, Bihar has witnessed a comparatively high growth rate and a bit of reform among the development parameters since 2005-06. The study found distinctively two growth regimes over the period of 1993-94 to 2017-18. The first growth regime – 1993-94 to 2004-05 was characterised as low and astatic growth, while the second growth regime – 2005-06 to 2017-18 has high and static growth. The average growth rate of GSDP is 3.55 percentage points higher in second regime than the first regime. This analysis explicitly shows that the economic growth in Bihar was phenomenal in the regime2 especially between 2005-06 and 2011-12.

The second most important dimension in the study of economic growth is the shape of the economy. Economic growth happens when the shape of the constituent parts of the economy changes over time along with the increase in size. In addition, the change in the composition of the income among the sectors is the core of the structural change. Taking into account the composition of the sectors in overall GSDP, we found a significant decline in the primary sector share with an increase in both secondary and tertiary sectors. Primary sector has witnessed significant decline in the sectoral share over the periods, while the growth in the primary sector could be due to a sound and well-designed Bihar Krishi road map since 2006-07. In the secondary sector, the income share increased by only 6.19 percentage points, where 68.33 percent of the growth is recorded in the third phase only, compared to the second phase.

Construction sector is the only sector that increased the sectoral share over the periods among the secondary sector, while the share of manufacturing and electricity/water has declined between the first and last growth phases. The construction led growth is the results of the expansionary

fiscal policy of the government including several public sector infrastructural development projects and boom in the real sectors. The third sector – tertiary has the maximum increase in the share by 5.18 percentage points between the first and second phase, while it grew by only 2.98 percentage points over the third and fourth periods. The sectoral growth in tertiary sector is mostly absorbed by trade/hotel and transport sectors, while the sectoral shares in public admin and other services declined over the periods. The capital accumulation and the multiplier effect of the developmental expenditure has been evident by the expansion of the service sector in the state. Lastly, we found that capital formation has positive impact on economic growth in Bihar, on the other hand, structural change in the income is growth reducing in the later periods of both regime1 and regime2, while it is growth-enhancing during the early periods of the regimes.

Appendix

Table A3.1 Contribution of sectors in the growth rate of the GSDP (in percentage)

Sl. No.	Sectors	1993-94/ 2000-01	2001-02/ 2005-06	2006-07/ 2011-12	2012-13/ 2017-18	1993-94- 2005-06	2006-07/ 2017-18	1993-94/ 2017-18
1	Primary	35.06	8.79	13.19	4.26	14.18	11.82	16.94
2	Secondary	10.88	27.39	27.54	37.65	15.63	26.22	20.23
3	Tertiary	54.4	62.53	61.05	61.33	69.47	63.59	62.34
4	GSDP	100	100	100	100	100	100	100
5	Residual	-0.35	1.03	-1.88	-3.41	0.72	-1.63	0.33
6	AGR	34.72	10.59	13.09	4.09	13.94	11.55	16.78
7	MIN	0.35	-0.78	0.1	0.51	0.24	0.27	0.16
8	MAN	2.42	2.33	7.02	34.75	1.44	11.55	7.24
9	EGW	3.97	1.29	1.36	1.19	2.4	1.49	1.64
10	CON	4.66	24.29	19.16	7.5	11.06	13.18	12.99
11	THR	12.44	28.68	22.09	16.18	21.39	20.24	20.39
12	TSC	6.04	6.46	10.37	15.5	6.97	13.72	9.7
13	FIRB	14.51	18.6	16.75	9.37	19.71	13.86	15.46
14	PAD	6.39	0.52	5.34	2.21	6.25	3.53	4.28
15	OS	15.2	9.3	6.81	18.74	15.14	12.5	12.34
16	GSDP	100	100	100	100	100	100	100
17	Residual	-0.69	-1.29	-1.99	-10.22	1.68	-1.9	-1.15

Source: Author's estimates.

Chapter 4

Changes in the Key Indicators of Labour Market and the Demographic Structure in Bihar

4.1 Introduction

As we have discussed in the [chapter 1](#), income and employment are the most important factors in determining the economic growth and structural change in the development process. The changes in the composition of the income and employment across the identified industrial sectors are the key to structural change. The previous chapter made an in-depth analysis of the income structure across several sectors of the Bihar economy and its changes over the study period. This chapter analyses the nature and origin of employment in the labour market structure of Bihar and the factors determining the changes in that labour market structure over the study period.

Labour market is divided, based on the activity status, into three broad categories namely – a) employed, b) unemployed, and c) inactive. National sample survey organisation (NSSO) defines the activity status as the participation of an individual in any economic or non-economic activities during a reference period¹³. Those who actively engaged in any economic activities are called employed¹⁴ while its proportion to the overall population is known as worker participation ratio (WPR), and when it is combined with unemployed, it is called labour force participation (LFPR). The major portion of the population usually remain inactive in the labour market and growth of such population is measured through inactivity rate. An increase in the employment and labour productivity helps economic growth and a fall would do other-wise. The demographic structure has a large bearing on the employment status of an individual as well as labour market structure ([Hollywood, Brown, Danson, & McQuaid 2007](#); [Kancs 2011](#)). The employed belonged to the working age are deemed to be highly productive than the other age population in the demographic structure.

The population is classified into three category – child age (0-14 years), working age (15 to 59 years), and old age (60 and above). A fall in the child age population due to decline in the fertility, rate and an increase in the old age population due to decline in the mortality rate are usually the major aspects of the demographic changes ([Wei & Hao, 2010](#)). In the initial phase, a demographic

¹³ A detailed definition of activity status and reference periods are given in the methodology section.

¹⁴ However, [ILO](#) defines employment as “all those person of working age who, during a short reference period, were engaged in any activity to produce goods or provide services for pay or profit”.

window opens up due to an increase in the working age population (Vallin, 2007). This situation gives an opportunity for higher growth potential due to an increase in the labour supply called demographic dividend (Mitra & Nagarajan, 2005; Thomas, 2014; Liao, 2011). However, despite such demographic dividend, the employment level of the working age population may fall as happened in Bihar. A fall in WPR is ominous to the growth prospect of any region.

Several studies found that the worker participation ratio as well as labour force participation ratio has declined considerably across the states of India, especially among the women (Mehrotra & Parida, 2017; Desai & Joshi, 2019; NSSO, 2019; Aggarwal, 2016). A further disaggregated analysis shows, the decline in female labour force was due to an increase in the education entitlement and higher engagement in the household chores. Studies shows an abrupt increase in the female gross enrolment ratios due to several incentives provided by the Bihar government to increase female literacy (MHRD, 2019) and also higher education entitlement of youth delayed the entry of the younger population in the labour market (Desai & Joshi 2019). Apart from the demographic structure, regions and gender dimensions, several socio-economic factors such as marital status, household size, education level, caste, class, religion and household types may determine the activity status of an individual. Therefore, the main objective of this chapter is to analyse the employment dynamics in the labour market and the determinants of declining labour force in Bihar along with the changes in the demographic structure and the activity status in the labour market over the period of 1993-94 to 2017-18.

4.2 Data Source and Methodology

In India, estimates of labour market indicators are done through a nationally representative primary survey at national and state level conducted by National Sample Survey Office (NSSO) under Ministry of Statistics and Programme Implementation (MoSPI), government of India. MoSPI is a separate ministry that has two wings – a) related to statistics (also called national statistical office, NSO), and b) programme implementation. NSSO comes under statistics wing. The government of India set up the National sample survey office in 1956 to conduct various socio-economic survey using scientific sampling methods. Through the survey NSSO collects several socio-economic data that are used by several public or private organisations and by researchers for planning and policy formulations. Employment and unemployment survey is only available official database on labour market among the surveys conducted by NSSO that is used to understand and estimate the situation of labour market in India and states.

The surveys on employment and unemployment were being conducted quinquennially from 27th round (October 1972-september 1973) onward till 2011-12. The last quinquennial survey was

the ninth survey on employment and unemployment in the series that was conducted in 68th rounds during July 2011-June 2012. Later, NSSO discontinued quinquennial employment and unemployment survey and proposed a new format for employment statistics known as Periodic Labour Force Survey (PLFS). This survey is proposed to conduct each and every year, and the reports are available by end of June. The first periodic labour force survey was conducted from July 2017 to June 2018 and reports were available publically by June 2019. Therefore, in this chapter, we have used data of both employment and unemployment survey and periodic labour force survey into analysis. The next section elaborates the variables used in the study along with the complexities in utilising the survey data.

Overall five rounds of employment and unemployment survey and one periodic labour force survey were conducted between the periods of analysis. We have taken all the surveys conducted between the periods in our analysis except one round of employment and unemployment survey conducted as 66th round from July 2009 to June 2010. Table 4.1 presents the descriptions of employment and unemployment surveys (EUS) and periodic labour force survey (PLFS) in terms of number of rounds, period of survey undertaken and sample for household and individual covered for both India and Bihar. There are many questions asked related to employment and unemployment along with socio-economic details of an individual and household characteristics. Some of the important household characteristics recorded in all surveys were – household size, social groups, religions, place of residence (sector), household monthly consumption expenditure and household type¹⁵. Whereas, several individual characteristics such as - sex, age, marital status, relation to the head of the household and level of education (general and technical) were also recorded along with the employment particulars of an individual.

Table 4.1 Descriptions of NSS rounds on Labour Force

Sl. No	Round	Period	Household Sample		Individual Sample	
			India	Bihar	India	Bihar
1	50 th	July 1993 - June 1994	1,15,369	6,669	5,64,740	34,577
2	55 th	July 1999 - June 2000	1,65,150	9,221	8,19,203	50,430
3	61 st	July 2004 - June 2005	1,24,680	5,754	6,02,833	30,844
4	68 th	July 2011 - June 2012	1,01,724	4,581	4,56,999	23,508
5	1 st PLFS	July 2017 - June 2018	1,02,113	4,544	4,33,339	22,080

Sources: Author's compilation

Out of five rounds of EUS survey, two rounds – 50th and 55th were conducted before the bifurcation of Bihar (on 15th November 2000, the state - Jharkhand were formed from Bihar). Therefore, while analysing the labour market indicators, I have utilised the samples of the present

¹⁵ Definitions of all the variables are covered under supporting documents in all the surveys undertaken.

area of Bihar only. To do so, I have selected the samples of regions of Bihar only using the variable '*nssregion*' from the survey rounds.

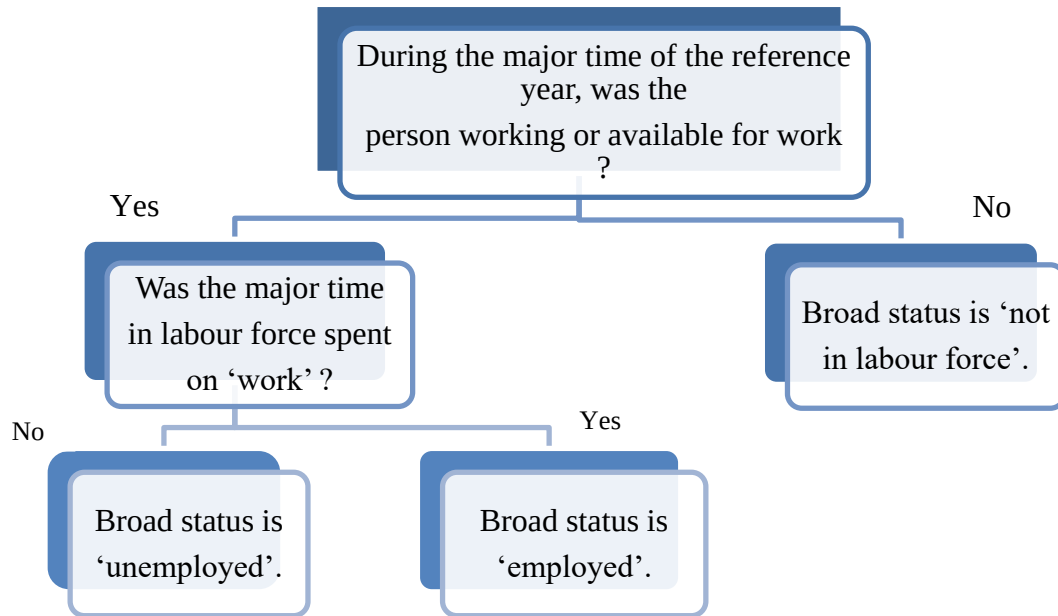
4.2.1 Variable Specifications

In this chapter, 'Activity status' is one of the major variable used throughout the text apart from the socio-economic characteristics. Activity status is defined as the participation of an individual in any type of activities (economic or non-economic) during a reference period. However, the activity participation of an individual are multidimensional, while it varies over various socio-economic factors viz. sex, education, religion, social groups, occupational and industrial classifications. An individual are categorised into various activity status based on the several economic or non-economic activities pursued by them in a reference period. Therefore, NSSO takes three types of reference period for the calculation of labour market situations of an individual – a) one year, b) one weak, and c) each day of the reference week. The activity status of an individual are determined based on these three types of reference periods. Usual activity status (US) is used to determine the activity status of an individual based on the reference period of one year. Determination of activity status based on one week reference period is called the current weekly status (CWS), while activity status of an individual within each day of the reference week is known as the current daily status (CDS). For the major part of the policy implementations and in the analysis of labour market situation usual activity status are used. Therefore, I have also used only usual activity status of an individual throughout the chapter in the analysis.

Moreover, the usual activity status are measured on two different status of an individual based on the time criterion within a one year reference period. An individual spent relatively major time in a year (365 days) preceding the date of the survey on any economic/non-economic activity are considered in principal activity status, while another status known as the subsidiary status of an individual. Individuals, who are employed under principal status and also engaged in any economic activity for 30 days or more preceding the date of survey during the reference period of one year, falls under subsidiary status. Therefore, usual activity status of an individual are determined based on both principal and subsidiary status identified within a reference period of one year. Further, based on the major time criteria an individual is found to be engaged into three categories broadly that determine their activity statuses during the reference period i.e. – employed, unemployed and out of labour force. An individual is considered as employed if he is working or engaged in any economic activity (work), while those individual who is not engaged in any type of economic activity and either seeking to get employed or available for work if it is available. Lastly, those who are either not engaged in any economic activities or available for any work falls under out of labour force category. The flow chart shown in [figure 4.1](#) shows the determination of activity status based

on major time criterion. These three broad activity statuses are further sub-divided into many categories (see NSS reports).

Figure 4.1 Flow chart for determination of activity status



Sources: NSS Report, 2017-18

To understand the labour market structure, based on activity status, International Labour Organisation (ILO) has identified seventeen key indicators of labour market (as discussed in introduction section). Out of seventeen, I have used only eleven key indicators in this chapter and the subsequent chapter because of the data availability and objective of the study. Some of the important key indicators of labour market are defined as follow:

Worker Population Ratio (WPR): WPR is the ratio of the number of employed person to the total population. It is defined as the number of person employed per 100 person.

$$WPR = \frac{\text{No.of employed person}}{\text{Total Population}} * 100 \quad (1)$$

Proportion Unemployed (PU): PU is the ratio of the number of unemployed person to the total population. It is defined as the number of person unemployed per 100 person.

$$PU = \frac{\text{No.of unemployed person}}{\text{Total Population}} * 100 \quad (2)$$

Labour Force Participation Rate (LFPR): LFPR is the ratio of the number of employed and unemployed person to the total population. It is defined as the number of person in labour force per 100 person.

$$LFPR = \frac{\text{No.of employed person} + \text{No.of Unemployed person}}{\text{Total Population}} * 100 \quad (3)$$

Unemployment rate (UR): UR is the ratio of the person unemployed to the population employed and unemployed. It is defined as the number of person unemployed per 100 person in labour force.

$$UR = \frac{\text{No.of Unemployed person}}{\text{No.of employed person} + \text{No.of Unemployed person}} * 100 \quad (4)$$

Inactivity rate (IR): IR is the ratio of the person neither employed nor unemployed (not in labour force) to the total population. It is defined as the number of person inactive per 100 person.

$$IR = \frac{\text{No.of person neither employed nor unemployed}}{\text{Total Population}} * 100 \quad (5)$$

In addition to activity status, several socio-economic characteristics of an individual/household have been used in this chapter. These variables are – gender, age, marital status, household size, household head, educational qualification (general and technical), social groups, religion, household type, and household monthly consumption expenditure etc. [Table 4.3](#) presents a detailed specifications of the variables and the categories within the variables for all survey rounds. Gender is categorised into two groups – a) male; and b) female. Age of a person is categorised into five groups, while social groups are divided into three groups only. We have merged the samples of scheduled tribe and scheduled castes together due to very less population of scheduled tribes in Bihar. Further, we have used the definitions of the variables as described in the instruction files of the nation sample survey rounds.

4.2.2 Multinomial Logistic Regression and Marginal Effects

Secondly, to ensure the influence of individuals¹⁶ and their household's socio-economic characteristics on the various positions of activity statuses, a pooled logit regression, unordered pooled multinomial logit regression are estimated, and later the marginal effect from both logit and multinomial logit regressions are estimated, apart from bar/line graph and cross tabulations. The logit regression is used when we have only two categories of a dependent variables, while the

¹⁶ The term individual stands for the employed people who are engaged in any occupation.

multinomial logit regression is used for more than two categories of a depended variable (Poterba & Summers, 1995; Kucharski & Kwiatkowski, 2006). Hence, multinomial logistic regression is an extension of the logit regression. The logit function is represented in equation form as follow:

$$\log it(\pi_{ij}) = \log[\pi_i/(1 - \pi_i)] = \beta_0 + \beta(X) + \varepsilon \quad (6)$$

Further, the beta coefficients of the multinomial logit regression are estimated using the first category as the reference . The equational form of the regression is given as:

$$Z_1 = \log Z \left(\frac{Y_2}{Y_1} \right) = a_1 + \sum b_{ij} * X_j \quad (7)$$

$$Z_2 = \log Z \left(\frac{Y_3}{Y_1} \right) = a_2 + \sum b_{ij} * X_j \quad (8)$$

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$$Z_n = \log Z \left(\frac{Y_n}{Y_1} \right) = a_n + \sum b_{ij} * X_j \quad (9)$$

where;

$a_1, a_2, a_3 \dots, a_n = \text{Constant}; b_{ij} = \text{Multinomial Regression Coefficient} (i = 1, 2, 3 \dots, n; j = 1, 2, 3 \dots, 7)$ Z_i is the linear function of the explanatory variables.

The coefficient of logistic or multinomial logistic regression is difficult to interpret, and also the estimates are dependent on the choice of the base outcome (Williams, 2012). Therefore, to overcome this issue, we have estimated the marginal effects¹⁷ to highlight the impact of the socio-economic characteristics on the variable of interests (Wooldridge, 2010; Patrick, *et al.*, 2016; Bisht & Pattanaik, 2020; Kumar, *et. al.*, 2021). The marginal effect provides the changes in the probability of the dependent variables with respect to the reference category.

The marginal effects in equation form are expressed as:

$$\text{Marginal Effect } (ME(X_1)) = \frac{\partial Y}{\partial X_1} = f'_1(X) = g_1(f(X)) \quad (10)$$

$$\text{Marginal Effect } (ME(X_n)) = \frac{\partial Y}{\partial X_n} = f'_n(X) = g_n(f(X)) \quad (11)$$

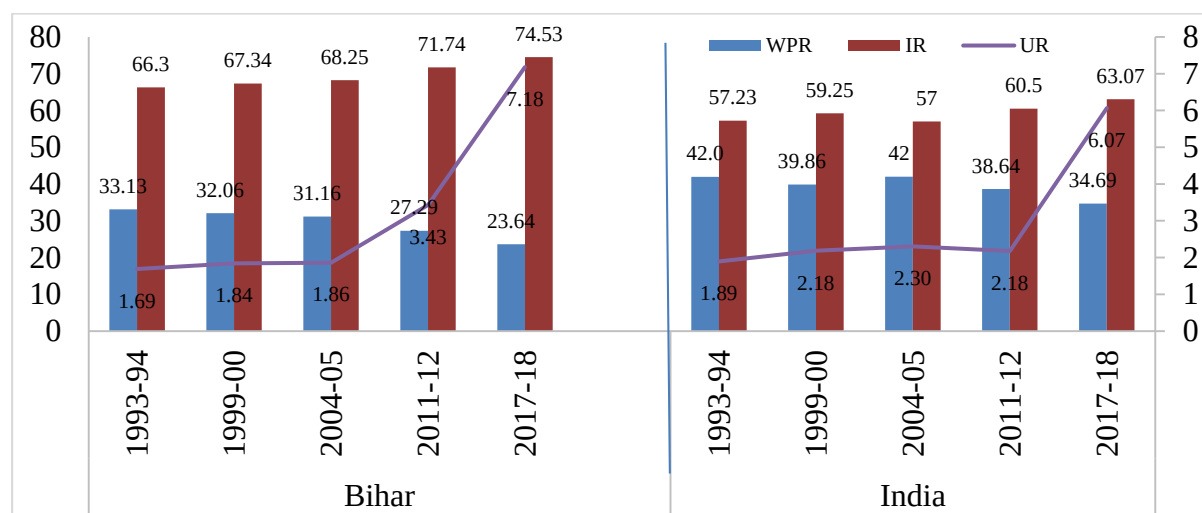
¹⁷ Marginal effects are estimated at the means, average and representative values. Here, we have estimated marginal effects at average (AMEs) (for details, see Williams, 2012).

The independent variables include the individual and its household's socio-economic background characteristics, i.e. age, sex, sector, general and technical education, marital status, religion, social group, household types and household size.

4.3 Structural Changes in the Activity Status

Taking into account the activity status of an individual, three distinct categories fall under the structure of labour market. These are employed – measured in terms of worker population ratio, unemployed – measured in terms of proportion unemployed, and out of labour force – measured in terms of Inactivity rate. Combination of both employed and unemployed are known as labour force and measured in terms of labour force participation rate. A bar graph in figure 4.2 presents the trends of employment indicators in Bihar and India. The secondary axis represents the trends for unemployment rate in right hand side. Over the period from 1993-94 to 2017-18, the fall in WPR was 2.18 percentage points higher in Bihar than India¹⁸. And the gap of WPR between Bihar and India has been increasing over time. It means that, the decline in WPR is faster in Bihar than national average. On the other side, inactivity rate has markedly increased by 8.23 percentage points from 66.3 in 1993-94 to 74.53 in 2017-18 for Bihar, while in India, the increment in IR was only by 5.84 percent in 2017-18 from 57.23 percent in 1993-94. Additionally, a rapid surge has been recorded for unemployment rate in both Bihar and India.

Figure 4.2 Trends of activity status in Bihar and India. (in percentage)



Sources: Authors computation from NSS data.

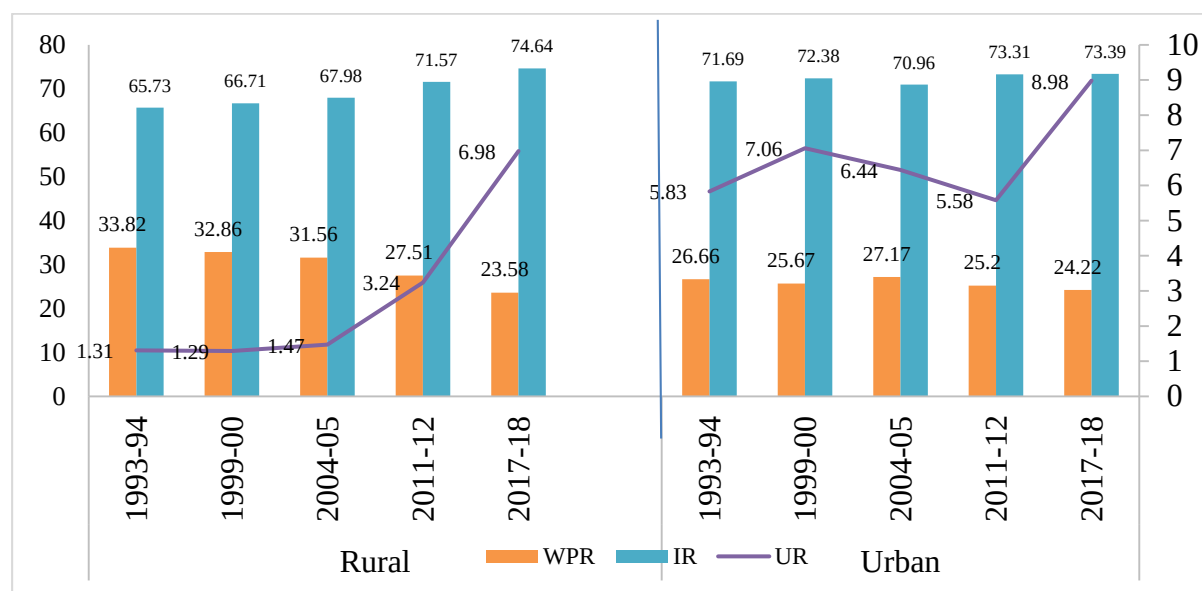
The graph clearly indicates that the situation of labour market in Bihar was much more vulnerable than the national average in terms of higher unemployment rate and lower worker population ratio. A declining WPR is worrying, however its decline was found across the states

¹⁸ Here, India represents all India average figures for employment indicators.

and union territories of India (except Delhi, Sikkim, and Chandigarh) in the last decade and a half (see [table A4.2 in appendix](#)). But the decline in WPR was sharper in Bihar in comparisons to the national average. In Bihar, around eighty percent population lives in the rural region¹⁹, therefore most of the variations in the activity status are expected from the rural region only. However apart from region, several factors such as - gender, social groups and age group of an individual also influences the WPR.

There is a wide regional variation in the labour market, which can be explained. The availability of resources and the opportunities of employment are different in urban and rural areas. An urban area has a potential to engage large number of population in manufacturing and service related employment, while the importance of primary sector are lesser. A combined bar and line graph presented in [figure 4.3](#) shows labour market structure in rural and urban regions. The secondary axis in the right side of the graph is meant for unemployment rate. It is explicit that unemployment rate was higher in each and every period for urban sector. The rural unemployment also began increasing since 2011-12, competing with urban unemployment. It may also suggest that introduction of MGNREGA has no impact on increasing rural employment in Bihar. What is worrying is, unemployment rate in rural was always higher than the previous period (except a marginal decline in 1999-00), while in urban, it fell down between 1999-00 and 2011-12 and again rose in 2017-18.

Figure 4.3 Rural-Urban activity status, 1994-2018



Sources: Author's estimate using NSS data.

¹⁹ NSSO uses term sector to denote the place of residence an individual in either rural or urban settings. I have used region in place of sector to denote the place of residence of an individual in this and the following chapters. It is because of the the term sector has been used for industrial classification in next chapter. So, to avoid confusion such interchange has been done.

Table 4.2 Trends of labour market indicators by gender, 1994-2018 for Bihar

Periods / Regions	Activity Status					
	WPR		IR		UR	
	Male	Female	Male	Female	Male	Female
Rural + Urban						
1993-94	50.24	13.98	48.83	85.87	1.82	1.13
1999-00	47.52	15.48	51.4	84.44	2.22	0.58
2004-05	47.5	13.17	51.41	86.78	2.24	0.38
2011-12	46.81	5.23	51.81	94.26	2.86	8.89
2017-18	42.04	2.68	54.59	97.24	7.42	2.9
Rural						
1993-94	51.02	14.76	48.22	85.13	1.47	0.74
1999-00	48.18	16.58	51.02	83.38	1.63	0.24
2004-05	47.73	13.82	51.4	86.16	1.79	0.22
2011-12	47.35	5.3	51.34	94.23	2.71	8.15
2017-18	42.02	2.53	54.71	97.41	7.22	2.32
Urban						
1993-94	43.26	6.18	54.22	93.24	5.5	8.58
1999-00	42.53	6.34	54.25	93.18	7.04	7.17
2004-05	45.19	6.55	51.54	93.17	6.75	4.1
2011-12	42.02	4.47	56	94.64	4.5	16.6
2017-18	42.33	4.19	53.36	95.53	9.24	6.05

Sources: Author's calculation from NSS Survey data.

Gender plays a major role in the employment and wages in the labour market. The female labour participation in the labour market has been falling at the nation level. Bihar is no exception, however, the situation of female in the labour force has worsened much in the recent time (Table 4.2). The work participation rate in rural area of Bihar have drastically fallen during 1993-94 to 2017-18, a fall from 14.76 percent to 2.53 percent, a fall of 83 percent. The inactivity rate has gone up, the unemployment rate has gone up sharply for rural areas as well as urban areas. A sharp fall in FWPR is observed during 2004-05 to 2011-12, which is actually puzzle. There is no adequate explanation for such fall, even if female education is popularly sited factor. There could be enumeration. Overall, it is explicit that the decline in the WPR was primarily due to the decline in rural area and further marked by both male and female where the contribution of fall in female WPR was higher than male.

4.4 Disaggregate Analysis of Activity status

Till now, we have discussed the trends and patterns of the three broad activity status (employed, unemployed, and out of labour force) of an individual in the labour market. Later, we have analysed the role of socio-economic indicators in deciding the the activity status and changes henceforth over the period of 1993-94 to 2017-18. This section is an extension of the analysis done in the

previous sections, while looking on the cause of the changes in the structure of the activity status of an individual after further disaggregating the activity status over the study period. To do so, this section deals with the significance of the various activity status while analysing the determinants of change in labour force participation and inactivity rate between 1993-94 and 2017-18. The sub-categories of the broad activity status were discussed briefly in the methodological section. [Table 4.3, 4.4, 4.5](#) present region wise disaggregated analysis of the changes in the activity status of an individual over the study period and the contribution of the two regimes in the overall changes. As it was observed that the workforce participation was declined significantly in regime2 rather than in regime1.

On the other hand, unemployed population has increased marginally, while a substantial increase was recorded for those who were out of labour force. For those who are the part of labour force categorised into seven sub-categories and those who are out of labour force also categorise in to seven sub-categories. Therefore, the entire population falls under these fourteen sub-categories based on their activity status in a given period. [Table 4.3](#) shows that regime2 contributed the most in the overall changes for majority of the activity status. An overall decline by 9.49 percentage points in the worker participation rate over 1993-94 to 2017-18 was driven by the decline in only two status namely – household helper and casual labourers: other than the public. Further, this decline was mostly observed in rural region rather than the urban. A decline by 8.53 percentage points was recorded in rural region for casual labourers: other, while casual labour: other increased marginally by 0.28 percentage points in urban region. The employment in household helper was decline for both rural and urban region, where decline in rural superseded urban region by 1.83 percentage points.

Moreover, there was a substantial increment in the salaried/wages population in the rural region, while a marginal decline by 0.71 percentage points was observed in urban. Own account workers were increased by 0.46 percentage points despite decline in the urban region. On the other hand, proportion of unemployed has increased by 1.26 percentage points, where unemployment in the rural region were higher than the urban. The decline in the employed person was parted with an increase in the category of out of labour force. A major gain in this category was observed in the education activity status followed by domestic duties. In both of the statuses the gain was mostly seen in rural region in compared to urban. Individuals in the activity statuses of rentiers, pensioners and work disability were also increased marginally. However, apart from an increment among four activity status, three status namely- domestic duties, free collection of goods and child has recorded decline over the periods.

When children enrolment in education increase, the household duties of women increases, such as – cooking, lunch box packaging, dropping and picking of children from school etc. The period of 2005 to 2011 was the high growth phase, where male employment has grown in absolute term, along with wages. A rise in wage income, coming from the male wage, remits in “housewifization”. As household income reaches a threshold, female labour is withdrawn to look after dependent, child care, home care etc. This could be the plausible explanations for a substantial fall in the FWPR. This is further correlated with the activity status of the female where domestic duties are reportedly increased. In addition to female education, the main factor for falling FWPR, stated by the scholars is that the kinds of sectors that led the growth during 2004-11 (at national level) are being low female labour intrinsic, such as transport, hotel, finance, real estate ([Bhalla & Kaur, 2011](#); [Kaur, 2004](#)).

Table 4.3 Region-wise changes in the activity status in Bihar, 1993-94 to 2017-18

Status Code	Activity Status	1993-94 to 2017-18			1993-94 to 2004-05			2004-05 to 2017-18		
		Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
11	Own Account Worker	0.55	-0.42	0.46	1.04	2.04	1.13	-0.49	-2.46	-0.67
12	Employer	0.03	0.34	0.05	-0.08	-0.17	-0.09	0.11	0.51	0.14
21	HH Helper	-4.22	-2.39	-4.04	1.3	0.24	1.22	-5.52	-2.63	-5.26
31	Salaries/Wages	1.52	-0.71	1.28	-0.29	-2.03	-0.49	1.81	1.32	1.77
41	Casual Labour: Public	0.43	0.45	0.43	-0.01	-0.04	-0.01	0.44	0.49	0.44
51	Casual Labour: Other	-8.53	0.28	-7.67	-4.22	0.47	-3.73	-4.31	-0.19	-3.94
81	Unemployed	1.32	0.74	1.26	0.02	0.22	0.02	1.3	0.52	1.24
91	Education	17.01	5.79	15.93	5.25	3.89	5.06	11.76	1.9	10.87
92	Domestic Duties	11.27	7.03	10.86	-1.69	-1.35	-1.69	12.96	8.38	12.55
93	Free Collection of Goods	-7.53	-3.1	-7.09	-0.63	1.34	-0.41	-6.9	-4.44	-6.68
94	Rentier, Pensioner	2.16	1.98	2.14	0.4	0.3	0.39	1.76	1.68	1.75
95	Work Disability	0.33	0.39	0.33	0.31	0.35	0.32	0.02	0.04	0.01
97	Others (Beggar/Prost.)	-10.94	-7.03	-10.56	-2.88	-3.16	-2.89	-8.06	-3.87	-7.67
99	Child	-3.38	-3.36	-3.37	1.5	-2.09	1.18	-4.88	-1.27	-4.55

Source: Author's calculation from NSS Survey data. Note: The changes are in percentage points.

Table 4.4 Sector-wise changes in the activity status for male in Bihar, 1993-94 to 2017-18

Status Code	Activity Status	1993-94 to 2017-18			1993-94 to 2004-05			2004-05 to 2017-18		
		Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
11	Own Account Worker	1.33	0.73	1.29	1.94	4.69	2.2	-0.61	-3.96	-0.91
12	Employer	0.14	0.67	0.19	-0.08	-0.29	-0.1	0.22	0.96	0.29
21	HH Helper	-5.43	-3.28	-5.21	0.24	0	0.23	-5.67	-3.28	-5.44
31	Salaries/Wages	2.32	-2.04	1.79	-0.67	-3.22	-1	2.99	1.18	2.79
41	Casual Labour: Public	0.8	0.79	0.79	-0.02	-0.08	-0.03	0.82	0.87	0.82
51	Casual Labour: Other	-8.16	2.19	-7.07	-4.69	0.83	-4.06	-3.47	1.36	-3.01
81	Unemployed	2.51	1.79	2.44	0.11	0.75	0.16	2.4	1.04	2.28
91	Education	15.27	4.72	14.2	3.63	1.72	3.36	11.64	3	10.84

92	Domestic Duties	0.73	0.04	0.67	-0.46	-0.48	-0.46	1.19	0.52	1.13
93	Free Collection of Goods	0.88	0.17	0.82	-0.11	-0.12	-0.11	0.99	0.29	0.93
94	Rentier, Pensioner	2.21	2.34	2.2	0.33	0.6	0.34	1.88	1.74	1.86
95	Work Disability	0.5	0.53	0.51	0.46	0.61	0.48	0.04	-0.08	0.03
97	Others (Beggar/Prost.)	-9.16	-6.9	-8.93	-2.69	-4.09	-2.8	-6.47	-2.81	-6.13
99	Child	-3.93	-1.75	-3.7	2.02	-0.92	1.78	-5.95	-0.83	-5.48

Source: Author's calculation from NSS Survey data. Note: The changes are in percentage points.

Table 4.5 Sector-wise changes in the activity status for female in Bihar, 1993-94 to 2017-18

Status Code	Activity Status	1993-94 to 2017-18			1993-94 to 2004-05			2004-05 to 2017-18		
		Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
11	Own Account Worker	-0.65	-0.77	-0.66	0.16	-0.35	0.11	-0.81	-0.42	-0.77
12	Employer	-0.12	0.01	-0.1	-0.09	0	-0.07	-0.03	0.01	-0.03
21	HH Helper	-2.9	-1.19	-2.75	2.51	0.66	2.34	-5.41	-1.85	-5.09
31	Salaries/Wages	0.57	1.48	0.66	0.12	-0.17	0.1	0.45	1.65	0.56
41	Casual Labour: Public	0.02	0.07	0.02	0.01	0	0.01	0.01	0.07	0.01
51	Casual Labour: Other	-9.14	-1.57	-8.45	-3.65	0.23	-3.28	-5.49	-1.8	-5.17
81	Unemployed	-0.05	-0.31	-0.08	-0.08	-0.3	-0.11	0.03	-0.01	0.03
91	Education	18.83	7.4	17.78	7.09	6.66	7.02	11.74	0.74	10.76
92	Domestic Duties	23.72	12.75	22.71	-3.17	-3.76	-3.25	26.89	16.51	25.96
93	Free Collection of Goods	-16.79	-7.26	-15.92	-1.33	2.63	-0.95	-15.46	-9.89	-14.97
94	Rentier, Pensioner	2.1	1.64	2.06	0.48	0	0.44	1.62	1.64	1.62
95	Work Disability	0.12	0.24	0.12	0.14	0.05	0.13	-0.02	0.19	-0.01
97	Others (Beggar/Prost.)	-12.92	-7.16	-12.4	-3.09	-2.09	-3	-9.83	-5.07	-9.4
99	Child	-2.76	-5.31	-2.99	0.91	-3.56	0.51	-3.67	-1.75	-3.5

Source: Author's calculation from NSS Survey data. Note: The changes are in percentage points.

Moving to the gender based observations, the change in the activity statuses over the periods of 1993-94 to 2017-18 are mostly driven by changes between 2004-05 and 2017-18. The decline in male WPR is due to a significant decline in rural region for two categories only namely- household helpers and casual labourers: other. On the contrary, a minimal decline in own account worker and employer were in addition for female compared to male. The proportion of unemployed were increased by 2.4 percentage points between 2004-05 to 2017-18 in rural region, while 2.44 percentage points change was observed from 1993-94 to 2017-18. On the other hand, there is a decline in the unemployed over the period for female in both rural and urban region. Lastly, in the third category -out of labour force, an increase in the education category is observed for both rural male and female, however, an increase in female is higher than the male.

4.5 Determinants of the Changes in the Activity Status

This section deals with an empirical estimation for the change in the structure of the labour market as well as the activity statuses of an individual. Here, we have estimated and analysed the marginal effect using pooled data of the five rounds of labour market survey over the period of 1993-94 to 2017-18. The importance of using marginal effects in pooled regression, methodology and the model specifications of the equations have been explained in the data and methodology section in details. Several equations for rural, urban and gender wise are estimated to see the difference and the changes among the variables. The dependent and independent variables used in the regressions are discussed separately further.

Table 4.6 presents two models of the marginal effects of the multinomial logistic regression using pooled data for five survey years of rural and urban region separately, and one model is estimated together (Rural and Urban). The dependent variables used in these model are the three broad activity status namely – employed, unemployed and inactive, while the explanatory variables are the socio-economic characteristics i.e. regions, gender, age groups, marital status, household head, household size, educational level, religion, social groups, household types, monthly per capita income of an individual and the year dummy (to estimate the change over the years). Further, categories of the explanatory variables are taken as shown in the tables. The reference category for each explanatory variables are shown in the bracket after the variable names. The rationale behind doing this exercise is to check whether the changes among the activity statuses are statistically significant or not and what is the probability of an individual to be in a specific activity status.

Taking into consideration the samples of both rural and urban in model (1), the key estimates of marginal effects for activity status confirm a statistically significant changes in the probability of being employed, unemployed and inactive for 2004-05, 2011-12 and 2017-18, except

insignificant changes for unemployed in 2004-05. However, the direction of change are different for each activity status. As we have discussed that the proportion of employed has declined throughout the period, the same can be witnessed here that the probability of being employed is declined by 10.7 percentage points in 2017-8 for an individual compared to 1993-94 taking other factors constant. This decline is highest among all of the survey years for the employed individuals. The probability of joining the inactivity status is higher by 9.9 percentage points in 2017-18, while it was only 6.6 percentage points in 2004-05. The magnitude for the change in the probability of unemployed is minimal though significant.

Moreover, disaggregating the effects separately by region as shown in model 2 and model 3 of [table 4.6](#), it indicates that the changes observed in the activity status in rural region is highly significant in all years except 1993-94, and 2004-05 for unemployed in addition. The changes in the probability is significant in 2017 for employed and inactive in urban region only. The probability of leaving the labour market is almost same as joining the labour market in 2017-18 for urban region. The probability of being unemployed is 1.0 percentage points higher for rural region in 2017-18, while it was 0.4 percentage points higher in 2004-05. The change in probability is 8.0 percentage points higher for rural region compared to the urban region in 2017-18.

The probability of being in employed is 2.4 percentage points significantly lower for urban region compared to rural after controlling the impact of other variables over the periods. On the contrary it is higher in urban for unemployed and inactive statuses, as shown in model 1. Gender could be seen as one of the most important variable, where the change in the probability is 32.4 percentage points lower for employed and 34.5 percentage points higher for being in an inactive status. For female, there is lower chances of being unemployed compared to male by a change in probability of 2.1 percentage points.

Taking into consideration the age factor of an individual, as the age goes up the probability of being employed increases significantly. The probability of being employed increases up to the maximum of 44.1 percentage points for age group 30-59, it came down to an increase of 18.2 percentage points for the older individual of age sixty or more. On the other hand, as the age increase the probability of being unemployed also increases by 3.70 percentage points for 22-29 years age group followed by 2.8 percentage points increase for 15-21 year age groups. The changes of being unemployed is almost zero for the aged people, while it is less for 30-59 years age group compared to below 30 years individuals. In inactivity status, the probability of being in this status significantly decline with an increase in the age up to sixty years. Therefore, the maximum decline

in the change in probability is observed for 30-59 year age groups, while the lowest is for the older people.

As per the labour law in India, the minimum age to participate in the labour market is fourteen years and above, while the minimum age of marriage for boys and girls are 21 and 18 years respectively. In our analysis, it is evident that the probability of engagement in an employment for married was 6.3 percentage points significantly higher than the unmarried. On the other hand, it is lesser for married to be unemployed or inactive. For a married person, the change in the probability of being inactive is 5.9 percentage points lower than the unmarried. The magnitude of the change in the probability of being unemployed is minimal, though it is statistically significant. The chances of being employed goes up by 17.9 percentage points if a person is the head of a household, while the chances increase much further if a person belong to rural region rather than urban. The probability of being employed increases by 18.3 and 14.9 percentage points for rural and urban regions respectively. Therefore, gender, marital status, being head of the household has an important and significant role in determining the activity status of an individual.

Household size, as another explanatory variable has significant role in the deciding activity status of an individual in both rural and urban region. Only household size of 5-8 has significant role in rural sector. Interestingly, the probability of being employed for 5-8 household size was significantly lower for rural region, while it was 0.09 percentage points higher for 5-8 household size in the urban region and 1.0 percentage points higher for the more than eight household size. It indicates that the household size works differently between rural and urban regions. This could be due to self-employed nature of agriculture and the existence of joint families in the rural region.

Table 4.6 Sector-wise marginal effect for activity status

VARIABLES	Rural + Urban			Rural			Urban		
	Employed	Unemployed	Inactive	Employed	Unemployed	Inactive	Employed	Unemployed	Inactive
Year (1993)									
1999	0.002 (0.003)	0.001 (0.001)	-0.003 (0.003)	0.003 (0.004)	0.00 (0.001)	-0.003 (0.004)	0.005 (0.007)	0.005 (0.003)	-0.01 (0.007)
2004	-0.011*** (0.004)	0.001 (0.001)	0.010** (0.004)	-0.013*** (0.005)	0.001 (0.001)	0.012** (0.005)	0.005 (0.008)	0.005 (0.004)	-0.011 (0.008)
2011	-0.069*** (0.004)	0.003*** (0.001)	0.066*** (0.004)	-0.075*** (0.004)	0.004*** (0.001)	0.071*** (0.004)	-0.01 (0.008)	-0.002 (0.003)	0.011 (0.008)
2017	-0.107*** (0.003)	0.009*** (0.001)	0.099*** (0.003)	-0.116*** (0.004)	0.010*** (0.001)	0.106*** (0.004)	-0.036*** (0.007)	0.003 (0.003)	0.033*** (0.007)
Region (Rural)									
Urban	-0.024*** (0.002)	0.004*** (0.001)	0.020*** (0.002)	-	-	-	-	-	-
Gender (Male)									
Female	-0.324*** (0.002)	-0.021*** (0.001)	0.345*** (0.002)	-0.323*** (0.003)	-0.021*** (0.001)	0.343*** (0.003)	-0.334*** (0.005)	-0.028*** (0.001)	0.362*** (0.005)
Age Groups (0-14)									
15-21	0.253*** (0.003)	0.028*** (0.001)	-0.281*** (0.003)	0.257*** (0.003)	0.027*** (0.001)	-0.285*** (0.003)	0.206*** (0.006)	0.033*** (0.003)	-0.239*** (0.006)
22-29	0.393*** (0.004)	0.037*** (0.002)	-0.430*** (0.004)	0.394*** (0.004)	0.035*** (0.002)	-0.429*** (0.004)	0.359*** (0.006)	0.055*** (0.004)	-0.414*** (0.006)
30-59	0.441*** (0.004)	0.010*** (0.001)	-0.451*** (0.004)	0.437*** (0.005)	0.010*** (0.001)	-0.447*** (0.005)	0.469*** (0.007)	0.017*** (0.002)	-0.485*** (0.007)
60+	0.182*** (0.004)	0.00 (0.00)	-0.182*** (0.004)	0.183*** (0.005)	0 (0.001)	-0.183*** (0.005)	0.160*** (0.008)	0.00 (0.00)	-0.160*** (0.008)
Marital Status (Unmarried)									
Married	0.063*** (0.002)	-0.004*** (0.001)	-0.059*** (0.002)	0.064*** (0.002)	-0.003*** (0.001)	-0.062*** (0.002)	0.042*** (0.004)	-0.011*** (0.002)	-0.032*** (0.004)
Head of the Household	0.179*** (0.004)	-0.009*** (0.001)	-0.170*** (0.004)	0.184*** (0.004)	-0.009*** (0.001)	-0.175*** (0.004)	0.149*** (0.007)	-0.014*** (0.002)	-0.135*** (0.007)
Household Size (1-5)									
5-8	-0.006*** (0.002)	0.004*** (0.001)	0.002 (0.002)	-0.007*** (0.002)	0.004*** (0.001)	0.003* (0.002)	0.009*** (0.003)	-0.001 (0.002)	-0.008** (0.004)
8+	-0.001 (0.002)	-0.001 (0.001)	0.002 (0.002)	-0.003 (0.003)	-0.001 (0.001)	0.005* (0.003)	0.010** (0.005)	0.006** (0.003)	-0.015*** (0.005)

General Education (Illiterate)									
Secondary	-0.027*** (0.002)	-0.001 (0.001)	0.028*** (0.002)	-0.025*** (0.002)	-0.002** (0.001)	0.027*** (0.002)	-0.039*** (0.004)	0.004** (0.002)	0.035*** (0.004)
Higher Secondary	-0.047*** (0.003)	0.00 (0.001)	0.047*** (0.003)	-0.040*** (0.003)	-0.001 (0.001)	0.041*** (0.003)	-0.076*** (0.005)	0.003 (0.002)	0.073*** (0.005)
Graduate & Above	-0.004 (0.004)	0.029*** (0.002)	-0.025*** (0.004)	0.002 (0.005)	0.025*** (0.003)	-0.027*** (0.005)	-0.036*** (0.006)	0.052*** (0.004)	-0.016*** (0.006)
Social Groups (ST/SC)									
Other Backward Caste	-0.023*** (0.002)	0.00 (0.001)	0.023*** (0.002)	-0.022*** (0.002)	0.00 (0.001)	0.022*** (0.002)	-0.022*** (0.004)	-0.006** (0.002)	0.028*** (0.004)
Others	-0.038*** (0.002)	0.00 (0.001)	0.038*** (0.002)	-0.039*** (0.002)	0.00 (0.001)	0.039*** (0.002)	-0.015*** (0.005)	-0.003 (0.003)	0.019*** (0.005)
Religion (Hindu)									
Islam	0.011*** (0.002)	-0.003*** (0.001)	-0.008*** (0.002)	0.009*** (0.002)	-0.003*** (0.001)	-0.006** (0.002)	0.019*** (0.004)	0.002 (0.002)	-0.020*** (0.004)
Others	-0.005 (0.008)	-0.001 (0.003)	0.006 (0.008)	-0.002 (0.009)	-0.002 (0.003)	0.004 (0.009)	0.002 (0.017)	-0.011* (0.007)	0.01 (0.017)
Household Types (Self-Employed)									
Salaried/ Regular	-0.005* (0.003)	-0.002** (0.001)	0.007** (0.003)	-0.003 (0.003)	-0.004*** (0.001)	0.006* (0.003)	-0.013*** (0.004)	0.004** (0.002)	0.009** (0.004)
Casual Labourer	0.023*** (0.002)	0.005*** (0.001)	-0.028*** (0.002)	0.025*** (0.002)	0.005*** (0.001)	-0.030*** (0.002)	-0.004 (0.005)	0.005** (0.003)	-0.001 (0.005)
Others	-0.084*** (0.002)	0.002** (0.001)	0.082*** (0.002)	-0.080*** (0.002)	0.001 (0.001)	0.079*** (0.002)	-0.110*** (0.004)	0.016*** (0.003)	0.095*** (0.004)
MPCE Quintiles (Poorest)))									
Poor	-0.004* (0.002)	0.004*** (0.001)	-0.001 (0.002)	-0.003 (0.002)	0.004*** (0.001)	-0.001 (0.002)	-0.002 (0.006)	0.004 (0.004)	-0.002 (0.006)
Middle	-0.005** (0.002)	-0.001 (0.001)	0.006*** (0.002)	-0.005** (0.002)	-0.001 (0.001)	0.006** (0.002)	-0.005 (0.006)	0.00 (0.003)	0.005 (0.006)
Rich	0.00 (0.002)	-0.002** (0.001)	0.003 (0.002)	0.00 (0.002)	-0.003*** (0.001)	0.003 (0.002)	-0.005 (0.006)	0.002 (0.003)	0.003 (0.006)
Richer	-0.012*** (0.002)	-0.002** (0.001)	0.014*** (0.002)	-0.007*** (0.003)	(0.002* (0.001)	0.009*** (0.003)	-0.030*** (0.005)	-0.007** (0.003)	0.037*** (0.005)
Observations	146,667	146,667	146,667	114,139	114,139	114,139	32,528	32,528	32,528

Source: Author's estimation; Standard errors are in parentheses *** p<0.01, ** p<0.05, * p<0.1

Education plays an important role in deciding the employment status of an individual. The chance of being employed declines with the education level, while it increases in inactivity status for secondary and higher secondary education and declines for the 'graduates and above'²⁰. On the other hand, the probability of being unemployed goes up with education level, however, it is found significant only in case of graduate and above category. The probability of being inactive is significantly higher by 3.5 and 7.3 percentage points for secondary and higher secondary in urban region, while it declines by 1.6 percentage points for graduate and above.

Considering the social groups i.e. scheduled caste/scheduled tribe (SC/ST), other backward caste (OBC) and 'others', the probability of being employed significantly goes down by 2.3 percentage points and 3.8 percentage points for OBC and 'others' respectively compared to SC/ST. On the contrary, the chances of being inactive goes up by 2.3 and 3.8 percentage points for OBC and other respectively. There were no significant changes observed for unemployment in any social groups. It implicate that there is an equal chance of unemployment among individuals of each social groups. Moving to the religion of an individuals, the chances of being employed was 1.1 percentage points significantly higher for the follower of Islam compared to Hinduism, while a negative change in probability for unemployed and inactive status was observed for Islam. A similar relationship was observed in rural and urban sector too, except an increase in the probability of being unemployed for Islam.

Last two explanatory variables i.e. household type and MPCE quintiles denotes the economic status of an individual. Taking to the household type, the chance of being employed significantly goes up by 2.3 percentage points for casual labourers, while it significantly goes down by 0.05 percentage points (at 10 percent significance level) and 8.4 percentage points for salaried/waged and others category respectively. On the other hand, in case of inactivity status, the change in the probability was significantly negative by 2.8 percentage points only for the casual labourers, while it was positive for salaried/waged and others by 0.07 percentage points and 8.2 percentage points respectively. Lastly, for the MPCE quintile, the changes in the probability for being employed were statistically significant only for richer and middle at 1 and 5 percent level of significance respectively. The chance of being employed for richer goes down by 0.12 percentage points compared to poorest, while 0.05 percentage decline was observed for middle category of MPCE. Similarly, opposite is true for the inactivity status among MPCE quintile. However, the probability of being unemployed goes down by 0.02 percentage points each for rich and richer categories. The

²⁰ Here, graduate and above refers to the individual education level is either graduate or above graduate: such as post-graduate, M.Phil., Ph.D. etc.

similar results were found for rural region, while for urban changes in the probability was only significant in case of richer categories across activity statuses.

4.5.1 Gender Wise Marginal Effect

The marginal effect analysis for rural region shows that the change in probability was statistically significant for male in 2011-12 and 2017-18 only across activity statuses, while the change in the probability of being employed has significantly declined for female from 2004-05 by 2.8 percentage points, 11.5 percentage points in 2011-12 to 14.3 percentage points in 2017-18. On the contrary, in the same way the chances of being inactive for female increased from 2004-05 to 2017-18, while it increases by 3.5 percentage points between 2011-12 and 2017-18 for male. A significant increases in the change in probability for female were found for unemployed only in 2011-12 by 0.04 percentage points, while for male, it was significantly increasing since 2011-12.

Moreover, gender wise segregation for marginal effects shown in [table 4.7](#) in urban region shows that the probability of being employed for male was significantly lower by 4.5 percentage points only in 2017-18. However, the decline in 2017-18 for female was lower than male but in addition to 2017-18, the probability of being employed was 2.3 percentage points lower for female in 2011-12 too. A significant increase in the inactivity was also found for female by 1.7 percentage points between 2011-12 and 2017-18.

Table 4.7 Gender wise marginal effect for activity status for rural sector

VARIABLES	Male			Female		
	Employed	Unemployed	Inactive	Employed	Unemployed	Inactive
Rural						
Year (1993)						
1999	0 (0.005)	0.001 (0.002)	-0.001 (0.005)	-0.002 (0.007)	-0.001 (0.001)	0.002 (0.007)
2004	0 (0.006)	0.003 (0.002)	-0.004 (0.006)	-0.028*** (0.008)	-0.001 (0.001)	0.029*** (0.008)
2011	-0.041*** (0.005)	0.005** (0.002)	0.037*** (0.005)	-0.115*** (0.007)	0.004*** (0.001)	0.111*** (0.007)
2017	-0.092*** (0.005)	0.020*** (0.002)	0.072*** (0.005)	-0.143*** (0.007)	-0.001 (0.001)	0.144*** (0.007)
Marital Status (Unmarried)						
Unmarried	0.131*** (0.005)	-0.001 (0.002)	-0.130*** (0.005)	-0.007** (0.004)	-0.001** (0)	0.008** (0.004)
Head of the Household						
Yes	0.141*** (0.006)	-0.020*** (0.002)	-0.121*** (0.006)	0.163*** (0.008)	-0.001 (0.001)	-0.162*** (0.008)
General Education (Illiterate)						
Secondary	-0.032*** (0.003)	-0.006*** (0.002)	0.038*** (0.003)	-0.029*** (0.003)	0 (0)	0.029*** (0.003)

Higher Secondary	-0.077*** (0.004)	-0.004 (0.002)	0.081*** (0.004)	0.050*** (0.01)	0.002 (0.001)	-0.052*** (0.01)
Graduate & Above	-0.046*** (0.005)	0.033*** (0.004)	0.014** (0.005)	0.113*** (0.015)	0.024** (0.009)	-0.137*** (0.017)
Urban						
Year (1993)						
1999	-0.002 (0.009)	0.012** (0.005)	-0.01 (0.009)	0.001 (0.009)	-0.006* (0.004)	0.005 (0.01)
2004	0.004 (0.011)	0.013* (0.007)	-0.018 (0.011)	0.005 (0.012)	-0.004 (0.004)	-0.002 (0.012)
2011	-0.007 (0.01)	-0.006 (0.006)	0.013 (0.01)	-0.023** (0.01)	-0.001 (0.004)	0.024** (0.011)
2017	-0.045*** (0.009)	0.009* (0.005)	0.036*** (0.009)	-0.036*** (0.009)	-0.005 (0.004)	0.041*** (0.01)
Marital Status (Unmarried)						
Unmarried	0.131*** (0.009)	-0.012*** (0.004)	-0.119*** (0.009)	-0.012** (0.006)	-0.005*** (0.001)	0.017*** (0.006)
Head of the household						
Yes	0.083*** (0.008)	-0.029*** (0.003)	-0.054*** (0.007)	0.172*** (0.017)	-0.004*** (0)	-0.169*** (0.017)
General Education (Illiterate)						
Secondary	-0.070*** (0.007)	0.003 (0.003)	0.067*** (0.007)	-0.024*** (0.004)	0.001 (0.001)	0.023*** (0.004)
Higher Secondary	-0.137*** (0.008)	0 (0.004)	0.138*** (0.008)	-0.002 (0.008)	0.003** (0.001)	-0.001 (0.008)
Graduate & Above	-0.121*** (0.008)	0.066*** (0.007)	0.055*** (0.009)	0.072*** (0.011)	0.013*** (0.003)	-0.085*** (0.011)

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Source: Author's estimation

In addition to year dummy, we found marital status and education level and head of the household as an important factors for having different nature for male and female. In both rural and urban region, the probability of being employed for married male was higher compared to unmarried, while it was lower for married female. The opposite is true for the inactivity status. Interestingly, the changes in the probability of being employed was higher for female compared to male if female was the head of the household. Further, the chance for a female to be employed were even higher if she belongs to the urban region. Lastly, the educational level of the female has a significant role in determining employment status. The probability of being employed increase as education level increase for female in rural region for both higher secondary, graduation and above graduation. On the other hand, the probability of employment decline by 7.7 percentage

points and 4.6 percentage points for higher secondary and graduate & above for male in rural, while a significant decline by 13.7 and 12.1 percentage points in urban region.

4.6 Conclusion

Decomposing the demographic structure into various activity status revealed that labour force participation has declined throughout the period, whereas, a sharp and significant decline is observed after 2004-05. The decline is mostly observed due to the withdrawal of the young female labour force in the rural region since 2004-05. Though, the gap between male and female employment is constant over the period among the working age population, where only 22.88 percent female is employed compared to 88.22 percent male employment in 1993-94 and it declined by 18.62 percentage points and 18.98 points for female and male respectively in 2017-18. A further disaggregated analysis of the activity status revealed that the decline in the female labour force participation is due to the increase of the female workforce in the education and domestic duties apart from a significant decline in the employment from the household categories in the employment status. Further, a significant decline is observed from the activity status of 'free collection of goods'.

Moreover, the marginal effects from the empirical estimations illustrates a significant impact of the socio-economic factors in the changes in the demographic structure of Bihar. We found that the probability of employment in urban is significantly lesser than the rural, while it is also lesser for female compared to male. With an increase in the age of an individual the chance of being employed increase up to the age of 60 years and later it declines. The probability of employment increases if a person is head of the household. Interestingly, the overall chances of employment declined with an increase in the education level among the female but it increase among the male. Apart from it social group, religion and household type found significant in determining the employment status. This patterns illustrate a significant improvement in the quality of life of the female workforce where an increase in investment in human capital is commendable in the process of development.

Bihar has the lowest employment level in the country. The female labour force participation is even worse. Bihar rural unemployment is lesser than urban. Unemployment goes up with education, salaried status. This is well known that have to work hard and work more to feed their families. Therefore, our analysis validate the hypothesis of the significant role of socio-economic factors in determining the activity status of an individual in labour market. Further it also validate that decline in female labour force participation has significantly higher impact in the decline in overall employment level in Bihar.

Appendix

Table A4.1 Descriptions of the socio-economic variables, 1993-94 to 2017-18

Variable/ Year	1993-94	1999-00	2004-05	2011-12	2017-18
Region					
Rural	82.6	81.4	76.5	73.9	70.9
Urban	17.4	18.6	23.5	26.1	29.1
Gender					
Male	52.9	52.1	52	53.2	53.3
Female	47.1	47.9	48	46.8	46.7
Age Groups					
0-14	39	41.7	41.7	36.4	31.2
15-21	13.4	12.1	11.3	13.6	17.1
22-29	12.1	11.5	11.1	11.2	12.1
30-59	29.5	28.6	30.1	32.3	32.8
60 & Above	6.1	6.1	5.9	6.5	6.9
Marital Status					
Unmarried	53.3	55.9	55.4	54	53.9
Married	46.7	44.1	44.6	46	46.1
Household Head					
Yes	19.3	18.3	18.7	19.5	20.6
No	80.7	81.7	81.3	80.5	79.4
Household Size					
1-4	23.7	20.8	22.2	24.5	29.5
5-8	55.8	54.4	56.7	60.6	62.4
8+	20.5	24.8	21.2	14.9	8.1
Education (general)					
Illiterate	58	57.7	46.8	32	27.6
Secondary	36.2	36.5	46.2	55.6	57.9
Higher Secondary	3	2.6	3.5	7.1	8.1
Graduation & Above	2.9	3.2	3.5	5.3	6.3
Social Groups					
ST/SC	19.8	18.6	19.1	16.1	20.4
OBC	0	56	60.6	61.2	59.7
Others	80.2	25.5	20.3	22.6	19.9
Religion					
Hindu	83.6	84.2	85.3	84.7	86.4
Islam	15.7	15.4	14.4	14.9	12.8
others	0.7	0.4	0.3	0.4	0.8
Household Type					
self-employed	55.9	53.9	65.5	58.5	57.2
salaried	5.7	5.9	7	12.7	14.6
Casual	29	28.8	15.2	20.8	19
others	9.4	11.5	12.3	8	9.2
MPCE Quintile					
poorer	17.6	18.2	16.7	15.4	18.6
poor	17.7	19.3	17.1	15.4	24.6
middle	19.1	16	20	17.8	16.3
rich	20.1	20	19.9	21.6	16.3
richer	25.4	26.5	26.3	29.8	24.2
Observations	33766	36768	30844	23505	22080

Sources: NSSO & PLFS

Table A4.2 Employment status for female of major states, 2004-05 to 2017-18

States/UT's	2004-05		2011-12		2017-18	
	WPR	LFPR	WPR	LFPR	WPR	LFPR
Jammu & Kashmir	22.84	23.45	22.33	23.57	20.97	22.89
Himachal Pradesh	48.49	49.65	49.15	49.79	37.95	39.67
Punjab	26.24	28.06	19.91	20.29	10.82	12.26
Uttaranchal	35.71	36.19	25.23	26.27	12.27	13.74
Haryana	26.93	27.45	14.14	14.49	9.51	10.73
Delhi	8.48	9.03	10.68	11.14	9.89	11.16
Rajasthan	35.4	35.55	29.91	30.11	18.82	19.27
Uttar Pradesh	21.62	21.74	16.08	16.26	9.13	9.42
Bihar	13.17	13.22	5.23	5.74	2.68	2.76
West Bengal	17.24	18.05	18.51	19.16	15.86	16.38
Jharkhand	28.28	28.37	16.97	17.57	10.32	10.89
Orissa	29.94	33.17	23.33	23.8	14.02	14.96
Chhattisgarh	41.39	41.58	37.84	38.18	35.27	36.46
Madhya Pradesh	31.63	31.71	20.72	20.83	22.89	23.39
Gujarat	33.69	33.88	22.06	22.18	14.73	15.37
Maharashtra	36.14	36.56	28.62	28.98	22.84	24.15
Andhra Pradesh	41.61	41.97	35.6	36.08	33.04	34.4
Karnataka	37.39	37.97	24.28	24.63	19.46	20.42
Goa	18.78	21.92	18.4	19.32	18.29	24.73
Kerala	24.33	31.61	21.31	24.81	16.37	21.31
Tamil Nadu	37.71	38.5	29.97	30.81	25.25	27.2
Pondicherry	23.05	25.85	17.57	18	10.93	13.96
Telangana		0		0	24.22	26.09
INDIA	28.67	29.42	21.95	22.48	16.51	17.5

Sources: NSSO & PLFS

Chapter 5

Structural Change and Employment Dynamics in Bihar

5.1 Introduction

Sectoral occupational and income transformation is always central to the development question of poor countries. While sectoral income transformation is happening in most poor economies in the course of development in the past 70 years, the occupational transformation remained a challenge which only few countries like China, South Korea and Taiwan have managed to solve. One can see the significant correlation with all those economies, between reduction of poverty, better distribution of income and sustainable growth on one hand and degree of occupational transformation on the other. A further saddening fact, as far as India is concerned, is the fact that the labour force participation has been declining not only in Bihar, but in all most all other Indian states. . While this decline is present for male and female labour, the latter has declined at an astonishing rate in the recent times. Decline in male employment normally happens in the course of increasing mechanization of agriculture and industry in capitalist economies. Coming to decline in female labour participation, scholars have identified several reasons for this such as the increased female educational enrolments, migration, and faster growth of male dominated sectors, housewifization' and changing domestic duties and role of females in the house in the light of above changes (Kumar & Bisht, 2020). Thus labour is getting displaced constantly everywhere.

In spite of all these, the economic growth in terms of gross state domestic product of Bihar is fairly high and remarkable in the recent decades. This begs a question that, why and where the displaced workforce are moving to? Second, how to understand the economic growth that does not create employment generation? Bihar, like several other Indian states, is witnessing two way movement of the workforce in the recent decades. Firstly, workforce is withdrawing from the labour market and secondly, there is some inter-sectoral movement of the workforce. We will examine the jobless growth and inter-sectoral movement in the present and next chapter through the lenses of the structural change, sectoral employment dynamics and productivity decomposition.

The migration of surplus labour in agriculture in principle will lead to an increase in savings, investment and the agricultural productivity (Lewis, 1956; Weiss, 2008), as well as accumulation of modern sector. But what are the sectors in modern sector that can absorb unskilled and semi-skilled labour from traditional occupations? Most unskilled will be confined to agriculture and

mining, the semi-skilled labour like assemblers, filters, machine workers may find place in manufacture, while skilled / educated find place in manufacturing, and tertiary category and knowledge workers in sunrise sectors like information technology (IT) (Kumar et al., 2021). Again, all non-farm jobs need not lie in urban locale, a substantial non-farm employment can happen within rural location.

There is yet another dimension, namely, that of gender. Patriarchal considerations make some occupations as ‘women-centric’ and others as ‘male-centric’. The prominent female occupations are nursing, homecare, teaching and several informal sector jobs like vegetable vending, and textile manufacturing, (Cole, 2014). Among these identifiable factors, age structure has a very significant role in determining the choice of occupation by an individual (Kaufman & Spilerman, 1982; Kumar et.al., 2021) Age plays a very crucial role in determining the retirement age for an individual for occupations (Smith 1969). In India, we have a wide range of retirement age based on the occupation, but for most of the occupations, the retirement age is 60 years. However, for the occupation in higher education like professorship and lecturer or in some judicial services, the retirement age is beyond 60 years. We talk about the retirement age mostly in case of formal employment, especially in the government sector. But in the private sector, there are no such regulations strictly followed. Previous studies lacks an in-depth analysis of the interaction between the occupational and industrial classifications utilizing several socio-economic factors in Bihar. These gaps have been filled through the analysis of the interaction of industrial and occupational classifications. Therefore, the main objective of this chapter is to analyse the dynamics of the employment status and occupational structure in the labour market for the study period. Further, the determinants of employment status has been analysed among various identified industrial sectors along with the engagement among several occupations considering socio-economic factors.

5.2 Data Source and Methodology

5.2.1 Data Source

The data on employment status is drawn from NSSO rounds, which follow National Industrial classification (NIC) for the estimations of employment status across the industries of work, and National classification of occupations (NCO) for occupations. MoSPI classify the industries of employment and occupations in one to four digit codes. Since independence MoSPI has modified and released NIC for six times. The first one is NIC-1962 and the last is named NIC-2008. NIC-1970, NIC-1987 and NIC-1998 is released in-between. Three different NIC namely – NIC-1987

(50th round), NIC-1998 (50th round), and NIC-2008 (61st round, 68th round and PLFS) have been used in the surveys carried over the period of 1993-94 to 2017-18.

On the other hand, Ministry of labour and Employment, government of India updates and releases national classification of occupations in India. So far, the ministry has released NCO for four times namely – NCO-1946, NCO-1958, NCO-2004 and NCO-2015. However, only two classification namely – NCO-1968 (50th to 61st round) and NCO-2004 (68th round and PLFS) have been used over the period of study. During updates of the classification, several dissimilarities have been found among classification due to additions, subtractions and coding of occupations. In case of NIC, most of the updates on versions of NIC are comparable at 2 digit level, therefore a concordance table is not needed. In the upcoming texts, NIC-2008 and NCO-2004 have been used to denote the industrial and occupational classifications based on concordance.

Table 5.1 Classification of sectors/sub-sectors

Categories	Industrial Sectoral Classification	Abbreviations
1	Agriculture, Hunting, forestry and fishing	Agriculture
2	Mining and quarrying	Mining
3	Manufacturing	Manufacturing
4	Electricity, gas, steam and air conditioning supply, Water supply; sewerage, waste management and remediation activities	Electricity
5	Construction	Construction
6	Wholesale and retail trade; repair of motor vehicles and motorcycles, Accommodation and Food service activities	Trade/hotel
7	Transportation and storage, Information and communication	Transport
8	Financial and insurance activities, Real estate activities, Professional, scientific and technical activities,	Finance/estate
9	Public administration and defence; compulsory social security	Public admin
10	Other services (Education, Human health and social work activities, Arts, entertainment and recreation, etc.)	Other service
1	Sum of categories 1 and 2	Primary
2	Sum of categories 3, 4 and 5	Secondary
3	Sum of categories 6, 7, 8 9, and 10	Tertiary

Sources: Author's classification based on NIC

Moreover, in the analysis of employment status NIC-2008 has been classified into three broad sectors and ten sub-sectors. According to NIC-2008, a detailed classification of sectors/sub-sectors and abbreviations used in the chapter are presented in [table 5.1](#). The workforce share of each sector/sub-sector has been derived using the usual activity status (defined in previous chapter) taking into account the principal and subsidiary economic activity of an individual.

Further, Census population data has been used to arrive at the number of workforce in each sector as population weight for workforce employed²¹ in the respective sector classified by NIC-2008.

Table 5.2 One digit occupational classification based NCO-2004

Sl. No	Occupational Classification	Abbreviations Used
1	Legislators, senior officials and managers	Managers
2	Professionals	Professionals
3	Technicians and associate professionals	Technicians
4	Clerks	Clerks
5	Service workers and shop & market sales workers	Service & sales workers
6	Skilled agricultural and fishery workers	Skilled agriculture workers
7	Craft and related trades workers	Craft workers
8	Plant and machine operators and assemblers	Machine operators
9	Elementary occupations	Elementary occupations

Source: Author's classification based on NCO-2004

Similarly, for National Classification of Occupations (NCO), we have used usual activity status of an individual with both principal and subsidiary status. Occupations, classified under NCO-2004, are categorised into five code structure – division, sub-division, group, family and occupations. It consists of 2,945 occupations listed under 116 groups (three digit code number) and ten broader divisions with a single-digit code number. We have excluded single-digit code structure, named division “X” (four groups), due to fewer sample size. A per NCO-2004, at one digit code there are ten categories, but the tenth category has been eliminated because of fewer sample. Therefore only nine categories of occupational classification will be compared. A detailed classification of occupation at one digit code is presented in [table 5.2](#), while two digit code of occupations and are presented in [appendix, table A5.1](#). Based on the data availability, the overall period has been divided into two regimes and three period for analysis – two regimes are 1993-94 to 2004-05 and 2004-05 to 2017-18. Employment statistics for 50th and 55th round are quite similar that's why 1993-94 to 2004-05 are also considered as one period for analysis.

5.2.2 Methodology

Data derived from national sample survey is the major unit of analysis in this chapter. Bar graphs, line graph, cross tabulations and several empirical estimation have been used. The methodology used for pooled logit/multinomial logit regression and marginal effects have already discussed in

²¹ Firstly, share of workforce were derived from NSSO and further the estimated share of workforce were multiplied to Census population to calculate actual workforce in different sectors.

the previous chapter. The same methodology has been utilised in this chapter too. However, methodology used for specific estimations are discussed below in details.

5.3 Employment Status across Industrial Classification

In the previous chapter, a detailed analysis of activity status is done across several socio-economic profile of an individual. Activity status of an individual is broadly divided into three categories – employed, unemployed and out of labour force and ten sub-categories²². The structure and changes in the activity statuses over 1993-94 to 2017-18 has also been explained in details. Here, in this chapter, only the employed status has been taken in the analysis, where employment status of an individual across the identified industrial classification (NIC) and occupational classification -NCO (explained in methodology section) have been analysed. As it is mentioned that region, gender and age is an important factor in deciding employment level (worker participation rate) of an individual across the periods. Therefore, taking into account the region, gender and age factors of an individual the employment status across the industrial and occupational classification have been also analysed in the following sub-sections respectively.

5.3.1 Employment Structure and its Trends over Years

According to the National Industrial classification – NIC-2008, all of the industries of productions are classified broadly into three categories, such as primary, secondary and tertiary sectors and ten sub-categories (see Table 5.1). The share of the workforce is an important indicator to analyse the productive capacity of these sectors and for structural change. A fall in labour force, with a rise in output share needs an inquiry into productivity analysis, which will be taken up in chapter 5. The relative shares of workforce across the industrial division over the period of 1993-94 to 2017-18 given in table 5.3 and table 5.4. Tables show the output share of sectors in GSDP (detailed in previous chapter) and sectoral share of workforce among overall workforce in Bihar. It shows that the rate of decline/gain in the share of workforce is much faster than the decline/gain in the output share among the sectors. Almost half of the overall decline in farm²³ sector, and an increase in the non-farm sector is recorded between 2011-12 and 2017-18.

²² The sub-categories of activity status are presented in the previous chapter in detail. In short, the categories are – own account workers, unpaid family workers, regular salaried/wage, casual wages labourers, unemployed, education, domestic duties, free collection of goods, renters/pensioners/work disability, and others.

²³ When categorizing the industries into two categories, the primary sector is widely known as the farm sector in many literatures, while non-farm are commonly known as the sectors other than the farm sector. Here in this chapter, farm sector are used interchangeably for primary sector, while non-farm is used for secondary and tertiary sector.

On the other hand, most of the changes in the output share are observed between 2004-05 and 2011-12. The workforce share in primary sector has significantly declined, from 80.7 percent in 1993-94 to 45.17 percent in 2017-18, a fall by 35.53 percentage points. The decline in primary sector is on an average 3.6 percentage points from 1993-94 to 2004-05, while the decline is steep between 2004-05 and 2017-18, by 14.65 percentage points. The decline in the share of primary sector is mostly gained by secondary sector rather than tertiary sector over the periods. Out of 35.53 percentage points decline in primary sector, 57.02 percent is gained by secondary sector, and 42.98 percent is gained by tertiary sector. The secondary sectors contributed 25.32 percent of the workforce that has increased from 5.06 percent contribution in 1993-94. Thirdly, an increment in the workforce share in tertiary sector is 15.27 percentage points from 14.24 percent in 1993-94 to 29.51 percent in 2017-18. An analysis of workforce share among the sectors clearly indicates a vital changes in the composition of the workforce over the periods.

Table 5.3 Share of income and workforce among three broad sectors for Bihar

Years	Share in GSDP			Share in Workforce		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
1993-94	40.86	13.70	45.44	80.70	5.06	14.24
1999-00	33.77	15.09	51.15	76.83	8.36	14.80
2004-05	33.50	13.75	52.74	73.50	9.12	17.39
2011-12	25.76	18.76	55.48	62.46	15.93	21.62
2017-18	21.54	20.17	58.29	45.17	25.32	29.51

Source: GSDP data are taken from DSE, Bihar and workforce are taken from NSSO and PLFS.

Table 5.4 Share of workforce among ten sectors

Sl. No.	Year	1993-94	1999-00	2004-05	2011-12	2017-18
1	Agriculture	80.61	76.62	73.4	62.38	45.1
2	Mining	0.09	0.21	0.1	0.08	0.07
3	Manufacturing	3.98	6.74	6.15	5.72	8.93
4	Electricity	0.28	0.08	0.08	0.03	0.09
5	Construction	0.8	1.54	2.89	10.18	16.3
6	Trade/hotel	6.11	7.04	9.5	10.59	13.68
7	Transport	1.37	1.82	2.6	2.95	4.13
8	Finance/estate	0.36	0.54	0.6	1.12	3.11
9	Public Admin	1.59	1.3	0.81	0.83	0.58
10	Other service	4.81	4.1	3.88	6.13	8.01

Sources: Author's estimation using NSS survey data

A disaggregated sectoral shares of labour in ten sectors of industries presented in table 5.4. We can see that the workforce share in agriculture has declined by 35.51 percentage points over the years, nonetheless agriculture continues to be the largest employer, while mining & quarrying has the least share of workforce. Other than agriculture, the workforce have declined marginally

among mining, electricity and public admin. Additionally, trade/hotel is the second most employable sector across periods after agriculture.

Within the secondary sector, it is the construction sector that provided employment to bulk of labour force, a smaller share by the manufacturing. The increase in share of construction has increased by a whopping 15.5 percentage points from 0.8 percent by 1993-94 and 16.3 percent in 2017-18. However, much of this has come only during 2004-05 to 2009-10. The share of manufacturing sector first increased from 3.21 percentage points to 5.72 percent in 2011-12 to 8.93 percent in 2017-18. Hence it is not the manufacturing that absorbed much of the outgoing labour from agriculture. As can be seen, it is the trade/hotel, after the construction sector that is the second highest employer of workforce and the highest among the tertiary sectors. Trade/hotel contributed 13.68 percent in 2017-18, a growth by 7.57 percentage points from 6.11 percent in 1993-94 (table 5.5).

5.3.2 Region-wise Changes in the Employment Status.

Looking at the rural-urban angle, we can see that there is an exit from agriculture, but they can still be located in rural areas, while some find jobs in urban locale. As table 5.5 shows that the falling share of agriculture which is located in rural sector, is not entirely absorbed by the urban sector, half of them are located in manufacturing and construction within rural sector. However, much of the tertiary sector jobs are located in urban areas, while only half of manufacturing and construction are located there. This is apparent that the rural region is mostly primary sector based economy, where most of the workforce are employed into the agriculture sector, while an urban setting are mostly depended on the tertiary/service sector. The primary sector in rural contributed almost half (48.85 percent) of the workforce in 2017-18, while tertiary sector contributed 65.67 percent in urban region followed by secondary. Therefore, the changes in the workforce composition in the rural region was mostly driven by the primary sector, where non-farm sector plays an important role in the urban sector, although non-farm sector spreads across rural as well as urban areas.

Table 5.5 Sector-wise employment status across years

Sl. No.	Year	1993-94	1999-00	2004-05	2011-12	2017-18
Rural						
1	Agriculture	85.99	83.12	77.97	67.58	48.8
2	Mining	0.08	0.15	0.09	0.08	0.05
3	Primary	86.07	83.27	78.06	67.66	48.85
4	Manufacturing	3.22	5.6	5.68	4.8	8.64
5	Electricity	0.27	0.03	0.07	0.01	0.05
6	Construction	0.67	1.32	2.54	10.35	16.6
7	Secondary	4.16	6.95	8.29	15.16	25.29

8	Trade/hotel	4.48	4.46	7.47	8.28	12.09
9	Transport	0.86	1.26	2.22	2.55	3.82
10	Finance/estate	0.15	0.24	0.23	0.46	2.58
11	Public Admin	0.83	0.61	0.46	0.43	0.5
12	Other service	3.45	3.21	3.28	5.46	6.86
13	Tertiary	9.77	9.78	13.66	17.18	25.85
Urban						
1	Agriculture	15.75	10.61	20.52	9.37	8.45
2	Mining	0.24	0.79	0.18	0.1	0.22
3	Primary	15.99	11.40	20.70	9.47	8.67
4	Manufacturing	13.12	18.34	11.58	15.2	11.87
5	Electricity	0.44	0.55	0.25	0.23	0.51
6	Construction	2.38	3.78	6.96	8.39	13.28
7	Secondary	15.94	22.67	18.79	23.82	25.66
8	Trade/hotel	25.69	33.29	32.88	34.14	29.37
9	Transport	7.58	7.51	6.97	6.95	7.23
10	Finance/estate	2.96	3.62	4.87	7.79	8.36
11	Public Admin	10.74	8.34	4.87	4.88	1.3
12	Other service	21.1	13.16	10.93	12.96	19.41
13	Tertiary	68.07	65.92	60.52	66.72	65.67

Sources: Author's estimations

Interestingly, the overall gain in the tertiary sector was completely driven by rural, while the workforce share in tertiary sector has decline by 2.4 percentage points in the urban from 68.07 percent to 65.67 percent. In urban, within tertiary sector, we observe that trade and hotels dominate in providing employment, while transport, real estate & finance follow as the next large employers. The share of public administration has drastically fallen over period, from 10.74 percent to 1.3 percent, showing falling government employment, while most of the employment is within informal sector. Several scholars have noted that quality of job creation is very poor in India, which is not capable of moving people of poverty (Kannan, 2017; Papola & Sahu, 2012; Papola, 2013). Summarily, it is explicit that the decline in the workforce share in the agriculture sector is mostly driven in rural region, while the equal gain was absorbed by non-farm sectors. In the non-farm sectors, construction is the most employable sector after agriculture in rural region. A significant increment in the workforce share of manufacturing and trade/hotel is commendable. On the other hand, in the urban region, a decline in the primary and tertiary sector is mostly absorbed by construction and trade/hotel sectors. Trade/hotel is found to be the most employable sector in the urban region in addition to 'other service' and construction sectors. However, a declining share of manufacturing sector in the urban region is worrisome and problematic.

5.3.3 Changes in Employment Status across Gender.

A most worrying aspect of Indian economy in the past two decades is the falling female labour force participation, as seen earlier. Though during 2017-18, 2.68 percent female was engaged in any economic activity, while it was 4.19 percent in an urban region. Several studies asserts that gender has an important role in the choices of the sector of employment and the types of occupations in labour market (Cole, 2014). Generally, female was found to be less engaged in secondary sector than male. Further it was found that the nature of employment of both male and female was diverse in rural and urban region. The trends and share of male and female labour employment across the sectors are presented in table 5.6 and 5.7. These tables present a comparative picture of gender dimension of employment across sectors.

The table 5.6 shows that the primary sector has the maximum decline in the male workforce driven by the decline in rural region, while the non-farm sector has gained by 21.25 percentage points in secondary sector and 12.52 percentage points in tertiary sector. Again the increment in the workforce was mostly driven by the changes in the workforce share in rural region only. It should be noted that in urban region, the decline in the share of workforce in the tertiary sector was due to the decline in the male workforce. In the contrary, there was an increment by 13.99 percentage points of male workforce in rural tertiary sector. Moreover, despite a significant decline in the farm employment for male in rural region, farm sector still employed around fifty percent of the workforce, while in the urban, tertiary sector has the highest workforce employed. In rural region, the secondary sector has the least employment share in 1993-94, while tertiary sector found to be least share in 2017-18. Similarly, in urban region, secondary sector has the least employment in 1993-94 which became the second least employable sector in 2017-18.

Moreover, we have observed even previously that within the overall decline of workforce share of agriculture, which has almost fallen by half during 1993-94 to 2017-18, we can see that the fall in relative share of female labour force is lesser, even now about 61.4 percent of female labour is located in agriculture, compared to 48.5 percent male labour force, in Bihar. This is sometimes referred to as feminization of agriculture.

Table 5.6 Employment status among males

Sl. No.	Year	1993-94	1999-00	2004-05	2011-12	2017-18
Rural + Urban						
1	Agriculture	78.4	74.51	70.57	61.38	44.62
2	Mining	0.08	0.25	0.12	0.09	0.07
3	Primary	78.48	74.76	70.69	61.47	44.69
4	Manufacturing	3.79	6.19	5.57	5.39	9.26

5	Electricity	0.36	0.1	0.1	0.03	0.09
6	Construction	1.00	1.98	3.61	10.89	17.05
7	Secondary	5.15	8.27	9.28	16.31	26.4
8	Trade/hotel	7.03	8.3	11.12	11.12	13.92
9	Transport	1.7	2.36	3.25	3.23	4.36
10	Finance/estate	0.43	0.67	0.74	1.2	3.24
11	Public Admin	1.87	1.62	0.97	0.88	0.56
12	Other service	5.35	4.03	3.94	5.79	6.82
13	Tertiary	16.38	16.98	20.02	22.22	28.9
Rural						
1	Agriculture	84.29	81.98	75.75	66.66	48.13
2	Mining	0.06	0.19	0.11	0.09	0.06
3	Primary	84.35	82.17	75.86	66.75	48.19
4	Manufacturing	3.05	4.88	5.03	4.45	9.03
5	Electricity	0.34	0.04	0.09	0.01	0.05
6	Construction	0.85	1.75	3.21	11.1	17.35
7	Secondary	4.24	6.67	8.33	15.56	26.43
8	Trade/hotel	5.17	5.23	8.76	8.69	12.25
9	Transport	1.07	1.66	2.8	2.8	4.02
10	Finance/estate	0.18	0.29	0.29	0.5	2.72
11	Public Admin	1.01	0.74	0.56	0.47	0.5
12	Other service	3.97	3.24	3.41	5.22	5.9
13	Tertiary	11.4	11.16	15.82	17.68	25.39
Urban						
1	Agriculture	15.6	9.67	17.2	8.27	8.67
2	Mining	0.27	0.79	0.21	0.11	0.24
3	Primary	15.87	10.46	17.41	8.38	8.91
4	Manufacturing	11.71	17.51	11.17	14.8	11.62
5	Electricity	0.49	0.56	0.28	0.24	0.56
6	Construction	2.6	3.95	7.83	8.75	14.06
7	Secondary	14.8	22.02	19.28	23.79	26.24
8	Trade/hotel	26.82	34.88	35.53	35.52	31.1
9	Transport	8.36	8.48	7.84	7.55	7.85
10	Finance/estate	3.07	4.02	5.43	8.25	8.53
11	Public Admin	11.05	9.24	5.11	5.02	1.19
12	Other service	20.03	10.88	9.39	11.49	16.19
13	Tertiary	69.33	67.5	63.3	67.83	64.86

Source: Author's estimation

Table 5.7 Employment status among female

Sl. No.	Year	1993-94	1999-00	2004-05	2011-12	2017-18
Rural + Urban						
1	Agriculture	89.49	83.58	84.63	72.52	53.61
2	Mining	0.12	0.06			
3	Primary	89.61	83.64	84.63	72.52	53.61
4	Manufacturing	4.73	8.56	8.42	9.14	3.2
5	Electricity					

6	Construction	0.02	0.11	0	2.98	2.77
7	Secondary	4.75	8.67	8.42	12.12	5.97
8	Trade/hotel	2.4	2.9	3.03	5.2	9.31
9	Transport	0.06	0.05	0.02	0.04	0.05
10	Finance/estate	0.08	0.12	0.02	0.23	0.91
11	Public Admin	0.47	0.25	0.19	0.37	0.86
12	Other service	2.64	4.35	3.68	9.52	29.3
13	Tertiary	5.65	7.67	6.94	15.36	40.43
Rural						
1	Agriculture	92.49	86.62	86.39	76.84	61.51
2	Mining	0.13	0.03			
3	Primary	92.62	86.65	86.39	76.84	61.51
4	Manufacturing	3.88	7.81	8.13	8.23	1.3
5	Electricity					
6	Construction	0	0	0	2.87	2.47
7	Secondary	3.88	7.81	8.13	11.1	3.77
8	Trade/hotel	1.83	2.07	2.62	4.09	9.16
9	Transport	0.03	0.05	0.02	0.04	0
10	Finance/estate	0	0.09	0	0.05	0
11	Public Admin	0.15	0.2	0.07	0.12	0.58
12	Other service	1.48	3.13	2.78	7.77	24.98
13	Tertiary	3.49	5.54	5.49	12.07	34.72
Urban						
1	Agriculture	17.04	17.86	46.69	22.1	5.97
2	Mining	0	0.79			
3	Primary	17.04	18.65	46.69	22.1	5.97
4	Manufacturing	25.35	24.71	14.77	19.85	14.69
5	Electricity					
6	Construction	0.44	2.48	0.04	4.24	4.62
7	Secondary	25.79	27.19	14.81	24.09	19.31
8	Trade/hotel	15.94	21.04	12	18.07	10.18
9	Transport	0.76	0.04	0.08	0	0.32
10	Finance/estate	2.02	0.58	0.43	2.44	6.4
11	Public Admin	8.06	1.38	2.93	3.31	2.52
12	Other service	30.4	30.7	23.06	29.99	55.31
13	Tertiary	57.18	53.74	38.5	53.81	74.73

Sources: Author's estimation using NSS survey data

Even though the tertiary sector share of employment has gone up for women workforce during the 35 years, one can see a drastic decline in public administration and trade hotels. Within the secondary sector, construction sector that employed 14 percent of male labour, but gave only 4 percent employment to females. Manufacturing that employs 11 percent of the male labour force, employs 1.3 percent of female labour force. Thus, the modern sectors of development have a

heavy bias against female labour employment, which offers little for them when they come out of agriculture. Hence we see a phenomenon of missing female labour force in employment.

The choices of the sector of employment for female are very limited in nature. The trends and distribution of female employment among sectors are presented in [table 5.7](#) illustrates that the female employment in some of the sectors were almost negligible for most of the years such as – mining, electricity, and construction. The nature and trends of employment in primary sector for female was quite similar to that of the male, while it was completely opposite in secondary and tertiary sectors. In rural region, the female employment in farm sector was as high as 92.49 percent in 1993-94 which came down to 61.51 percent in 2017-18. The decline in primary sector was mostly started after 2004-05 for both rural and urban regions.

Interestingly, the female workforce was declined in secondary sector for both rural and urban region over the periods. In the rural region, secondary sector has the lowest female employment and recorded a marginal decline by 0.11 percentage points from 3.88 percent to 3.77 percent, while in urban, secondary sector was the most employable sector after tertiary and contributed around a quarter in 1993-94 which fell down to 19.31 percent in 2017-18 by 6.48 percentage points. However, the decline in the secondary sector was due to the sharp decline in workforce share in manufacturing sector in contrast to an increment of workforce share in construction for both rural and urban region. On the other hand, there was a significant rise in the workforce share in tertiary sector for both rural and urban sector where the increment in rural region was higher than the urban. Among tertiary sector, the only other service sector has the highest increment in both regions, while other sectors have completely opposite nature in rural and urban regions except transport and finance.

In nutshell, it is found that the gender has an importance in employment dynamics in both rural and urban regions. The decline in female labour force and an increase in the female employment in the tertiary sector has vital implications for the Bihar economy. The trends indicate a feminisation of service sector rather than the agriculture sector in the rural and urban sector. The decline in the female employment in agriculture sector could be due to the increment of the income level of the agriculture households, which made the household to engage in other service sector instead of agriculture.

5.4 Employment Status across Occupational Classification

Apart from employment status of an individual across industries, the structure of occupations also vary across socio-economic categories in the labour market. Occupations indicates the nature of

work done by an individual in any establishments for their livelihoods. The occupational choices²⁴ have also changed over the period for an individual. In India, very few studies focus on the part of the occupation and categorise them among the several socioeconomic categories, while there is not even a single study done specifically for Bihar which takes into account the occupational classification and its changes over time. Backing upon the importance of the study, this section analyse the occupational nature of an individual across the region (rural & urban). Therefore, we have done a detailed analysis of the occupational structure and the choices over the period of 2011-12 to 2017-18 to understand the changing nature of the occupations across industries in Bihar. Additionally, as we have seen in the above sections that the workforce in the primary sector has declined significantly over the periods, therefore, this is imperative to know that who are these workforce which have moved out from primary sector, and what are the nature of occupations. The analysis done in this section would decipher this questions.

Moreover, the availability of jobs varies widely for rural and urban sectors. The urban sector offers better employment opportunities and better-paid jobs than the rural sector. The neoclassical theory of migration and development also suggests that the wage differential is the prime reason for the rural to urban migration ([Lewis 1954](#); [Ranis & Fei 1961](#); [Lucas 2004](#)). The urban also offers a wide array of jobs. Rural jobs are mostly unskilled, while urban jobs are skilled, semi-skilled and unskilled. NSSO gives us unit level data on employment in different activities, specifying even the education levels.

5.4.1 An Interaction of Occupational vs. Industrial Categories

Till now, we have seen the various dynamics and the changes in the structure of industrial and occupational classifications as per the NIC and NCO separately. This section deals with one of the important classification of occupations across the industrial classifications over two latest time periods based on the national classification of occupations-2004. These are described above in the data and methodology sections according to the NCO-2004, there are nine categories of occupations as per one digit classification. This further classification provides us more depth insight for the dynamics of occupational classification across industrial sectors and the role of the occupations in the respective sectors. An analysis of occupations over the industrial categories illustrates that the occupations concentrated toward primary sector is skilled agriculture workers

²⁴ Occupational choices are defined as a process of selecting an occupation by individual based on their preferred interest. However, occupational choices are based on the interplay of psychological, social and economic aspects ([Blau et al., 1956](#)). [Brennan and Gallagher \(2017\)](#) identifies occupational choices as a process of engagement into various occupations to meet their needs and values, controlled by internal and external factors. Some intrinsic factors such as age, gender, education, wealth etc. are identified as an important factor and has profound role in defining the occupational choices ([Croll, 2008](#); [Galvaan, 2015](#)).

and elementary occupations. Only clerical jobs are concentrated towards secondary sector, while all other occupational categories namely – managers, professionals, technicians, service and sales workers are concentrated to the tertiary sector. However, it is found that for *elementary occupations* category there is a regional effects, where most of it is concentrated to the secondary sector in urban compared to primary sector in rural region. Further, even though several types of occupations found under tertiary sector but the number of workforce engaged into them is less than the primary sector.

An interaction between occupational classification across the three broad industrial sectors namely – Primary, Secondary and tertiary sector is presented in [table 5.8](#). It shows the composition of workforce under three broad sectors across occupational classification. Under primary sector, 98.59 percent workforce is engaged either in skilled agriculture workers or elementary works in 2011-12, which fall down to 96.68 percent in 2017-18. Interestingly, 15.33 percentage point decline is observed for elementary occupations, *in contrast*, there is an increase in the workforce for skilled agriculture workers by 13.42 percentage points. Though most of the workforce engaged into primary sector belongs to rural regions, therefore, the overall effect is driven by the rural region only. In contrast, analysing through urban region, there is a decline in skilled agriculture workers but a marginal increment is observed for elementary occupations. This indicates that there is an increase in labourers in informal market in the urban region. Apart from these two (Skilled workers and elementary occupations) all other occupations fall under less than 5 percent in rural region. A significant increase in the workforce is found for service/sale workers in urban region by 5.33 percentage points. A similar increment is recorded for the ‘managers’ category in both rural and urban regions, while the number of professionals, technicians and craft workers has decreased over the periods.

The maximum number of workforce engaged into secondary sector is for craft workers and elementary workers in 2011-12, where more than 85 percent workforce were engaged. Craft workers alone are half of the workforce followed by 36.05 percent in elementary occupations. However the workforce engaged in these occupations increased over the periods due to an increment in the elementary occupations especially in both rural and urban region, while craft workers has declined in both regions. The decline in the urban region is higher than the rural region for crafts workers. A massive decline in the workforce is recorded for managers in urban region compared to rural. In urban, for manager category, the workforce declined by 14.24 percentage points from 17.64 percent in 2011-12 to 3.4 percent in 2017-18. While in the rural, the decline for the occupational category is 6.54 percentage points over the period. A slight increase is observed for professionals, technicians and service/sale workers, while the workforce has

declined for occupations categories namely – clerks and machine operators in urban. In contrast to urban, there is an increment for machine operators by 2.38 percentage points in rural from 2.72 percent in 2011-12 to 5.1 percent in 2017-18.

Taking into account the third sector namely - tertiary sector, the maximum workforce engaged is in the service/sales workers, further the workforce has increased by 11.18 percentage points over the periods. The increment observed in this category is higher in rural than urban region. Apart from SSW, other four categories namely – professionals, clerks, craft workers and machine operators have also observed an increment in the workforce, while the trend is consistent throughout the regions. A huge increment for professionals is seen in urban region compared to rural where the workforce is increased by 21.79 percentage points from 6.34 in 2011-12 to 15.45 in 2017-18.

Table 5.8 Industry wise one digit code for occupational classification for 2011-12 to 2017-18

NCO	Occupations	2011-12				2017-18			
		Primary	Secondary	Tertiary	Total	Primary	Secondary	Tertiary	Total
1	Legislators, senior officials and managers	0.01	9.62	20.31	5.94	2.35	2	6.9	3.6
2	Professionals	0.1	0.07	8.36	1.88	0.04	0.93	11.01	3.49
3	Technicians and associate professionals	0.59	0.05	12.12	3	0	0.1	11.1	3.29
4	Clerks	0.01	0.35	1.4	0.37	0	0.03	5.01	1.48
5	Service workers and shop & market sales workers	0.09	0.19	31.46	6.9	0.81	2.53	42.64	13.54
6	Skilled agricultural and fishery workers	48.23	0.18	0.59	30.24	61.65	0.82	0.13	28.18
7	Craft and related trades workers	0.45	50.82	3.67	9.2	0.04	44.84	5.9	13.1
8	Plant and machine operators and assemblers	0.16	2.67	5.72	1.76	0.07	4.81	11.66	4.67
9	Elementary occupations	50.36	36.05	16.37	40.72	35.03	43.93	5.65	28.65
Rural									
1	Legislators, senior officials and managers	0	8.4	20.29	4.78	2.35	1.86	6.4	3.27
2	Professionals	0.09	0.01	9.13	1.63	0.03	0.79	9.87	2.76
3	Technicians and associate professionals	0.58	0.04	11.38	2.36	0	0.03	10.53	2.72
4	Clerks	0.01	0.27	1.14	0.24	0	0	5.36	1.38
5	Service workers and shop & market sales workers	0.09	0.22	31.1	5.45	0.73	1.96	43.64	12.1
6	Skilled agricultural and fishery workers	48.01	0.2	0.6	32.56	61.77	0.89	0.14	30.51
7	Craft and related trades workers	0.44	50.36	3.51	8.58	0.05	45.22	6.03	13
8	Plant and machine operators and assemblers	0.16	2.72	6.23	1.59	0.05	5.1	12.53	4.54
9	Elementary occupations	50.62	37.78	16.62	42.81	35.02	44.15	5.5	29.72
Urban									
1	Legislators, senior officials and managers	0.92	17.64	20.38	17.87	2.62	3.4	8.86	6.91
2	Professionals	0.89	0.49	6.34	4.44	0.45	2.34	15.45	10.77
3	Technicians and associate professionals	0.99	0.1	14.07	9.52	0	0.79	13.33	8.94
4	Clerks	0	0.88	2.09	1.6	0	0.3	3.65	2.47
5	Service workers and shop & market sales workers	0	0	32.4	21.66	5.33	8.12	38.71	27.93
6	Skilled agricultural and fishery workers	64.63	0	0.55	6.56	54.77	0.2	0.08	4.9
7	Craft and related trades workers	1.04	53.87	4.08	15.54	0	41.19	5.4	14.13
8	Plant and machine operators and assemblers	0	2.38	4.39	3.5	1.06	1.96	8.26	6.01
9	Elementary occupations	31.52	24.64	15.71	19.33	35.77	41.7	6.25	17.94

Source: Author's estimation

In clerks category, it consist only 5.01 percent workforce in 2017-18 that has gone up from 1.4 percent in 2011-12. The increase is mostly driven by the rise of workforce in the rural region. The same trend is recorded for craft workers. In case of machine operators, the workforce in both rural and urban region have doubled than the previous periods in 2017-18. In contrary to the occupations where an increment has recorded, there were four occupations namely – managers, technicians, skilled agriculture workers and elementary occupations recorded decline in workforce. Managers and elementary occupations together held 36.68 percent workforce in 2011-12 which fell down to 12.55 percent in 2017-18. Skilled agriculture workers have the lowest workforce in tertiary sector as it is natural. The decline for technicians are marginal in both rural and urban regions, where still urban region has more technicians compared to rural.

5.5 Determinants of Changes in the Employment Patterns

This section deals with an empirical estimation for the change in the structure of the employment pattern across sectors as well as the effect of the socio-economic characteristics of an individuals. We have estimated various multinomial logistic regressions, and also the marginal effects were derived using pooled data of the five rounds of labour market survey over the period of 1993-94 to 2017-18. Several multinomial equations were estimated across regions and gender-wise using three broad sectors to see the difference and the changes among the variables. The dependent and independent variables used in the regressions are discussed separately further.

The regression results are presented in the [table 5.9](#), it presents two models of estimated marginal effects of the multinomial logistic regression using pooled data for five survey years of rural and urban regions separately, and one model were estimated together (Rural and Urban). The dependent variables used in the models are the three broad industrial classification namely – primary, secondary and tertiary sectors, while the explanatory variables are the socio-economic characteristics i.e. regions, gender, age groups, marital status, household head, household size, educational level, religion, social groups, household types, monthly per capita income of an individual and the year dummy (to estimate the change over the years). Further, categories of the explanatory variables were taken as shown in the tables. The reference category for each explanatory variable shown in the bracket after the variable names. The rationale behind doing this exercise is to check whether the changes among the employment status are statistically significant or not and what is the probability of an individual to be in a specific industrial classification.

The estimates of the marginal effect of the pooled regression using three broad sector as dependent variable and socio-economic variables as independent variables are presented in [table 5.9](#). The estimates suggests that the probability of being in primary sector is declining with

increasing rate since 2004-05. The chances of employment in primary sector for an individual significantly declined by 2.1 percentage points in 2017-18, declined to 10.5 percentage points in 2011-12 and further declined to 24.2 percentage points. The decline in the probability is largely driven by the decline in the rural region, as we can see that in rural region the decline in the probability is 11.2 percentage points significantly lower in 2011-12 which further declined by 15.0 percentage points between 2011-12 and 2017-18. On the other hand there is a significant decline in the primary sector employment in urban region throughout the periods. However, the magnitude of the probability of decline in urban region is lesser than the rural region.

Taking into account the secondary sector, there is a significant increase in the probability of engagement for both rural and urban regions over the periods. The change in the probability is 2.4 percentage points higher in 1993-94 which went up to 20.0 percentage points in 2017-18. It should be noted that the change in the probability for employment in secondary sector is initially lower in the rural than the urban region, which became higher in the rural than urban in 2017-18. However, the change in the probability is largely seen between 2011-12 and 2017-18 in rural region. In contrast an increase in the change in probability points is marginally increased by 1.8 percentage points from 10.8 percentage points in 2011-12 to 12.6 percentage points in 2017-18. Lastly the third tertiary sector, the changes in the probability is statistically significant over the periods only in urban region, while in rural, there is a significant higher probability by 21.0 percentage points only in 2017-18, in contrast to a significantly lower probability by 3.0 percentage points in 1999-00. Interestingly, the probability of engagement in tertiary sector for an individual has significantly decline in urban region. The maximum change in the probability points is observed in 2004-05 where the chances of being in tertiary sector is lower by 12.5 percentage points in urban region. Though the probability in rural region is also lower but that is not statistically significant.

Table 5.9 Multinomial marginal effect of pooled regression for NIC 3 Sectors over years

VARIABLES	Rural + Urban			Rural			Urban		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
Year (1993)									
1999	0.01 (0.009)	0.024*** 0.005	-0.033*** 0.008	0.013 0.01	0.017*** 0.005	-0.030*** 0.009	-0.038** 0.017	0.101*** 0.015	-0.063*** 0.02
2004	-0.021** (0.01)	0.036*** (0.006)	-0.015* (0.009)	-0.029*** (0.011)	0.034*** (0.007)	-0.005 (0.01)	0.062*** (0.021)	0.064*** (0.019)	-0.125*** (0.025)
2011	-0.105*** (0.01)	0.094*** (0.007)	0.011 (0.009)	-0.112*** (0.011)	0.094*** (0.007)	0.017* (0.01)	-0.051*** (0.018)	0.108*** (0.019)	-0.057** (0.023)
2017	-0.242*** (0.009)	0.200*** 0.006	0.042*** 0.008	-0.262*** (0.01)	0.210*** (0.006)	0.052*** (0.009)	-0.055*** (0.017)	0.126*** (0.015)	-0.071*** (0.02)
Sector (Rural)									
Urban	-0.474*** (0.008)	0.158*** (0.008)	0.316*** (0.008)						
Gender (Male)									
Female	0.071*** (0.007)	-0.061*** (0.005)	-0.01 (0.007)	0.072*** (0.009)	-0.063*** (0.006)	-0.009 (0.007)	0.057*** (0.015)	-0.033** (0.015)	-0.025 (0.018)
Age Groups (15-21)									
22-29	0.006 (0.009)	-0.028*** (0.009)	0.022*** (0.008)	0.004 (0.011)	-0.029*** (0.01)	0.024*** (0.009)	0.015 (0.017)	-0.003 (0.02)	-0.012 (0.022)
30-59	0.012 (0.010)	-0.049*** (0.009)	0.037*** (0.008)	0.014 (0.011)	-0.053*** (0.010)	0.038*** (0.009)	-0.024 (0.017)	0.005 (0.021)	0.02 (0.024)
60+	0.109*** (0.011)	-0.098*** (0.010)	-0.01 (0.010)	0.113*** (0.013)	-0.105*** (0.011)	-0.008 (0.010)	0.060*** (0.023)	-0.015 (0.026)	-0.045 (0.030)
Marital Status (Unmarried)									
Married	0.002 (0.007)	0.011* (0.006)	-0.013** (0.006)	0.002 (0.008)	0.011* (0.006)	-0.013** (0.007)	0.015 (0.009)	-0.008 (0.014)	-0.008 (0.015)
Head of the Household									
Yes	-0.014** (0.006)	-0.001 (0.005)	0.014*** (0.005)	-0.016** (0.007)	0 (0.006)	0.015*** (0.005)	0.024*** (0.009)	-0.026** (0.013)	0.002 (0.014)
Household Size (1-5)									
05-Aug	-0.015*** (0.005)	0.021*** (0.004)	-0.006 (0.004)	-0.017*** (0.005)	0.025*** (0.004)	-0.008* (0.004)	0.003 (0.008)	-0.009 (0.011)	0.006 (0.012)
8+	-0.015* (0.008)	0.007 (0.007)	0.008 (0.007)	-0.019** (0.009)	0.013* (0.008)	0.006 (0.007)	0.031** (0.013)	-0.029* (0.016)	-0.002 (0.018)

General Education (Illiterate)									
Secondary	-0.074*** (0.005)	0.005 (0.004)	0.069*** (0.004)	-0.073*** (0.005)	0.005 (0.005)	0.069*** (0.004)	-0.083*** (0.010)	0.02 (0.012)	0.063*** (0.014)
Higher Secondary	-0.116*** (0.010)	-0.043*** (0.007)	0.160*** (0.009)	-0.121*** (0.011)	-0.039*** (0.008)	0.160*** (0.010)	-0.074*** (0.015)	-0.083*** (0.018)	0.157*** (0.021)
Graduate & Above	-0.146*** (0.011)	-0.086*** (0.007)	0.232*** (0.010)	-0.146*** (0.013)	-0.096*** (0.007)	0.242*** (0.012)	-0.110*** (0.013)	-0.101*** (0.015)	0.211*** (0.018)
Social Groups (ST/SC)									
Other Backward Caste	-0.003 (0.005)	-0.005 (0.004)	0.008 (0.005)	-0.005 (0.006)	-0.004 (0.005)	0.009 (0.005)	0.015* (0.008)	-0.01 (0.012)	-0.006 (0.013)
Others	0.065*** (0.007)	-0.039*** (0.006)	-0.027*** (0.006)	0.070*** (0.008)	-0.045*** (0.006)	-0.025*** (0.006)	0.022** (0.011)	0.027* (0.015)	-0.049*** (0.016)
Religion (Hindu)									
Islam	-0.119*** (0.007)	0.095*** (0.006)	0.025*** (0.006)	-0.119*** (0.008)	0.091*** (0.007)	0.028*** (0.007)	-0.088*** (0.006)	0.113*** (0.014)	-0.025* (0.014)
Others	0.097*** (0.020)	-0.019 (0.016)	-0.079*** (0.017)	0.122*** (0.021)	-0.027 (0.017)	-0.095*** (0.016)	-0.090*** (0.025)	-0.038 (0.050)	0.128** (0.053)
Household Types (Self-Employed)									
Salaried/ Regular	-0.435*** (0.010)	0.176*** (0.009)	0.259*** (0.010)	-0.476*** (0.011)	0.196*** (0.011)	0.280*** (0.012)	-0.081*** (0.006)	0.01 (0.011)	0.071*** (0.012)
Casual Labourer	0.027*** (0.005)	0.133*** (0.004)	-0.160*** (0.004)	0.021*** (0.006)	0.119*** (0.005)	-0.140*** (0.004)	0.061*** (0.012)	0.292*** (0.016)	-0.353*** (0.016)
Others	-0.206*** (0.010)	0.104*** (0.009)	0.103*** (0.010)	-0.237*** (0.011)	0.118*** (0.010)	0.119*** (0.011)	0.100*** (0.019)	-0.015 (0.018)	-0.085*** (0.023)
MPCE Quintiles (Poorest)									
Poor	-0.008 (0.006)	0.004 (0.005)	0.004 (0.006)	-0.008 (0.007)	0.007 (0.005)	0 (0.006)	0.006 (0.012)	-0.064*** (0.017)	0.058*** (0.019)
Middle	-0.015** (0.007)	0.015*** (0.005)	0 (0.006)	-0.015** (0.008)	0.016*** (0.006)	-0.001 (0.006)	-0.001 (0.013)	-0.017 (0.018)	0.018 (0.020)
Rich	-0.024*** (0.007)	0.013** (0.006)	0.011* (0.006)	-0.026*** (0.008)	0.019*** (0.006)	0.006 (0.006)	-0.003 (0.012)	-0.068*** (0.017)	0.071*** (0.019)
Richer	-0.011 (0.007)	-0.015*** (0.006)	0.026*** (0.006)	-0.009 (0.008)	-0.014** (0.006)	0.023*** (0.007)	-0.006 (0.012)	-0.078*** (0.017)	0.083*** (0.018)
Observations	42,054	42,054	42,054	33,559	33,559	33,559	8,495	8,495	8,495

Sources: Author's estimation using NSSO and PFLS survey data.

The probability of being employed in primary sector is significantly lower by 47.4 percentage points in urban region as shown in the model 1. . That is quite obvious it is because of the nature of occupations identified are mostly belongs to rural regions only. On the contrary the probability of engagement in secondary and tertiary sector is 15.8 and 31.6 percentage points higher respectively in urban region over the periods (The reader should not be confused with the negative probability for tertiary sector in urban sector as shown in model 3). Gender played an important role in deciding sector of employment for primary and secondary sector only. As it is evident that the probability of being in primary sector for female is 7.1 percentage points higher than male, while it is 6.1 percentage points less for secondary sector. The similar position is recorded in rural and urban regions for female.

Considering the age factor of an individual, it is found that only for age groups 60 or above years has a significantly higher chances of engagement in primary sector by 10.9 percentage points. However, as the age of an individual increases the chances of engagement in secondary sector declined continuously. An individual of age group 22-29 years has 2.8 percentage points lower chances of employment in secondary sector, while if it comes to 30-59 age group the change in probability further declined by 2.1 percentage points and even further for older age group. For the tertiary sector, the probability of engagement significantly increased up to 60 years of age. However the probability of engagement in the tertiary sector is 3.7 percentage points higher for 30-59 age group compared to 2.2 percentage points higher for 22-29 year age group. A similar trend is also seen in the rural region considering the age groups among the sectors. However, in case of urban region, only for the older individual has a significant increment in the probability of engagement in primary sector.

Marital status of an individual did not seem to have any significant role in deciding the choices of sectoral employment in urban region, while it is significant lower by 1.3 percentage points at 5 percent level of significance for tertiary sector in rural region. If an individual is a head of the household then the probability of engagement in tertiary sector is significantly higher by 1.4 percentage points, while it is significantly lower by 1.4 percentage points in tertiary sector. The same trend is prevalent in rural region too. However, in urban, the probability is significantly higher by 2.4 percentage points in primary sector and lower by 2.6 percentage points in secondary sector. Household size also did not seem to play any important role except for primary and secondary sector in rural region.

The role education in the choices of sector of employment are highly examined in several studies. It is found that the less educated person is mostly engaged in the primary sector while the

as the level of education increases the probability of engagement in the service sector increases. The same can be found in case of Bihar too, where the probability of engagement in the primary sector declined if the education level goes up. The chance of engagement in secondary sector also declined after higher secondary level of education. On the other hand, the probability of engagement increased as the education level went up for tertiary sector. The similar findings is observed in both rural and urban regions. An individual belonged to other social group has only significant higher chances of engagement in primary sector and lower chances in secondary and tertiary sector. However, the lower chance of engagement in secondary sector is not statistically significant for secondary sector in urban sector. Taking to the religion factor of an individual, it is found that for the Islam the probability is lower in primary sector but it is significantly higher in secondary and tertiary sector. An opposite probability is observed for other category of religion. The similar trend is recorded in rural region, while the chances of engagement in tertiary sector is lower in rural for others and higher in urban region. However, the lower chance of engagement in secondary sector is not statistically significant for secondary sector in both rural and urban region for others religion category.

Household type and monthly per capita income quintile determine the economic status of an individual. Whether the economic status has any role in deciding the sector of employment is understood through taking these variables in the analysis. Household type is found to be an important determinants, where a person belonged to a salaried household has a significantly lower probability of engagement in primary sector, while it is significantly higher for secondary and tertiary sector. However, the magnitude of the probability for tertiary sector is higher than the secondary sector. For the other category the similar trend is observed, except the probability of being in tertiary is marginally lower than secondary. On the contrary, the probability of engagement in the primary sector and secondary sector is higher for casual labourers, while it is lower in tertiary sector. The significance level is found similar in both rural and urban regions except for other category. In case of other category, the lower probability for secondary sector is not found significant and there is a higher chances of engagement in primary sector in urban region compared to a lower chance of engagement in rural. Last but not the least, the rich monthly per capita expenditure (mpce) quintile has only significant lower chances of engagement in primary sector, while it is significantly higher for middle and lower for secondary sector in middle and richer mpce quintile respectively. There is a significantly higher chance for the richer people to be engaged in the tertiary sector. The significance level is found almost similar across regions except for lower chance of urban rich in secondary sector and higher chances of urban poor in tertiary sector.

Table 5.10 Gender wise marginal effect of pooled regression for NIC three Sectors for Rural and Urban.

VARIABLES	Male			Female		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
RURAL						
1999.year	0.029*** (0.011)	0.011* (0.006)	-0.040*** (0.010)	-0.044*** (0.014)	0.028*** (0.011)	0.016 (0.011)
2004.year	-0.024* (0.013)	0.031*** (0.008)	-0.007 (0.012)	-0.043** (0.017)	0.041*** (0.014)	0.003 (0.013)
2011.year	-0.109*** (0.013)	0.100*** (0.008)	0.009 (0.012)	-0.101*** (0.023)	0.076*** (0.020)	0.025 (0.016)
2017.year	-0.266*** (0.011)	0.225*** (0.007)	0.041*** (0.010)	-0.070*** (0.019)	-0.008 (0.013)	0.078*** (0.016)
Observations	27,872	27,872	27,872	5,687	5,687	5,687
URBAN						
1999.year	-0.042** (0.018)	0.105*** (0.016)	-0.063*** (0.021)	0.007 (0.050)	0.039 (0.039)	-0.045 (0.055)
2004.year	0.038* (0.022)	0.080*** (0.021)	-0.118*** (0.026)	0.213*** (0.061)	-0.034 (0.045)	-0.179*** (0.063)
2011.year	-0.059*** (0.019)	0.113*** (0.020)	-0.054** (0.024)	0.022 (0.060)	0.115** (0.055)	-0.138** (0.066)
2017.year	-0.055*** (0.017)	0.131*** (0.016)	-0.077*** (0.021)	-0.029 (0.054)	0.147*** (0.045)	-0.118** (0.059)
Observations	7,624	7,624	7,624	871	871	871

Sources: Author's estimation.

Moreover, as we found that the gender is a significant variable in the choices of sectors in the previous estimates done. A separate estimates using the gender variable as a unit of analysis has been performed to understand the nature of changes over time among male and female. A region wise marginal effect analysis using pooled regression for male and female is shown in [table 5.10](#). The dependent variables are the three sectors of the industrial classification and the independent variables are the socio-economic characteristics of male and female. The estimates suggest that the probability of being employed in primary sector is significantly declining over the periods for male and female in both rural and urban regions. However, the magnitude of declining is higher for rural male than other categories. For the secondary sector, the change in probability significantly increased over the periods for rural and urban male, while it significantly increased up to 211-12 for rural female and also the probability were significantly higher for urban female only in 2011-12 and 2017-18. In case of tertiary sector, the only significantly higher probability of engagement is observed in 2017-18 for rural male, while it is significantly declining for urban male over the periods. The similar trends were observed in case of rural and urban female.

5.6 Conclusion

Despite declining labour force participation, Bihar has witnessed comparatively high growth rate in the recent decades. A considerable share of the workforce moved from agriculture to secondary and tertiary sectors. The share of workforce in the primary sector has declined by 35.53 percentage points, in which about eighty percent of the workforce declined between 2004-05 and 2017-18. The decline of the workforce share in primary sector is absorbed into secondary and tertiary sector in 57:43 ratio.

A further disaggregated analysis revealed that the maximum workforce is absorbed in the construction sector followed by trade and hotel services. Interestingly, the employment share in the service sector has declined for male in the urban region in contrast to a significant rise in rural region. On the other hand, the impact of female employment can be observed as the rise in tertiary sector employment in both regions compared to the decline in primary sector employment. However, gazing over the workforce participation by occupational classification, it revealed that the decline of the workforce in the primary sector is due to withdrawal of casual wage labourers in the sector rather than the experienced and skilled market oriented workers. Lastly, regression results support the significant role of socio-economic factors in choices of the employment sectors and further, it convey the rise of non-farm sectors in rural region which are the most employment generating sectors apart from agriculture sector. The analysis also shows that the composition of employment and occupational level has significantly changed over the study period.

Appendix

Table A5.1 Sector wise 2-digit occupational classification, 2011-12 to 2017-18

Code	Occupations	R+U		Rural		Urban	
		2011-12	2017-18	2011-12	2017-18	2011-12	2017-18
11	Legislators and Senior Officials	0.01	0.84	0.01	0.82	0	1.1
12	Corporate Managers	5.94	2.7	4.82	2.39	17.74	5.8
13	General Managers	0.08	0.06	0	0.06	0.89	0.02
21	Physical, Mathematical and Engineering Science Professionals	0.03	0.39	0.02	0.3	0.15	1.28
22	Life Science and Health Professionals	0.16	0.44	0.15	0.33	0.29	1.56
23	Teaching Professionals	0.89	1.75	0.74	1.37	2.4	5.54
24	Other Professionals	0.83	0.91	0.73	0.76	1.78	2.38
31	Physical and Engineering Science Associate Professionals.	0.17	0.19	0.15	0.14	0.35	0.68
32	Life Science and Health Associate Professionals	0.57	0.07	0.52	0.03	1.13	0.48
33	Teaching Associate Professionals	1.54	1.94	1.35	1.7	3.56	4.34
34	Other Associate Professionals	0.76	1.09	0.36	0.86	4.89	3.43
41	Office Clerks	0.27	1.29	0.2	1.23	1.03	1.97

42	Customer Services Clerks	0.1	0.19	0.05	0.16	0.65	0.51
51	Personal and Protective Service Workers	1.58	2	1.45	1.85	2.96	3.46
52	Models, Sales Persons and Demonstrators	5.41	11.54	4.06	10.24	19.62	24.47
61	Market Oriented Skilled Agricultural and Fishery Workers	29.86	26.98	32.05	29.2	6.91	4.79
62	Subsistence Agricultural and Fishery Workers	0.87	1.2	0.95	1.31	0	0.11
71	Extraction and Building Trades Workers	6.36	8.16	6.37	8.35	6.27	6.28
72	Metal, Machinery and Related Trades Workers	0.49	1.98	0.37	1.93	1.74	2.5
73	Precision, Handicraft, Printing and Related Trades Workers	0.3	0.44	0.25	0.37	0.79	1.1
74	Other Craft and Related Trades Workers	2.18	2.53	1.68	2.35	7.4	4.24
81	Stationary Plant and Related Operators	0.07	0.2	0.06	0.2	0.19	0.18
82	Machine Operators and Assemblers	0.82	0.97	0.8	0.98	1.03	0.88
83	Drivers and Mobile-Plant Operators	0.9	3.5	0.75	3.36	2.43	4.96
91	Sales and Services Elementary Occupations	0.12	1.48	0.12	1.25	0.14	3.71
92	Agricultural, Fishery and Related Labourers	35.94	16.87	38.63	18.16	7.56	3.97
93	Labourers in Mining, Construction, Manufacturing and Transport	3.77	10.3	3.35	10.31	8.1	10.26

Source: Author's estimation

Chapter 6

Structural Change and Labour Dynamics: A Productivity Decomposition Approach

6.1 Introduction

Bihar, as said earlier chapters, is not only of the most backward states in India, but also it is one of most populous state with high population density. The high rates of population growth has a dampening effect on per capital income growth and structural change also becomes a slow and delayed process. This makes it more challenging how structural change happens in backward states. Income/output and employment are the two identified key factors of structural change in an economy, where in the process of continuous economic growth a set of interrelated changes occurs in the form of the change in compositions in income share, and employability across the sectors in the process of overall growth in terms of income and productivity. The structure and the structural change in the income/output have been discussed in details in chapter 4 taking into account the gross state domestic product of Bihar. This chapter discusses the dynamics of employment factor initially and later it takes into account both the employment and income/output in the analysis of productivity growth and structural change in the Bihar economy.

The movement of workforce from low productive sectors to the high productive sectors are key to structural change and economic growth (Lewis, 1954; Ranis & Fei, 1961; Hasan, Lamba, & Gupta 2013; Herrendorf, et al., 2014; Ahsan & Mitra 2017; Mcmillan, Margaret S & Rodrik 2011). Particularly, the movement of the workforce occurs from the sectors having lesser income elasticity of demands and employment elasticity towards having higher income and employment elasticity. However, the structural change does not happen automatically, though its growth process could be slow, rapid or episodic depending upon the acceleration of the economic factors or “fundamentals” as human capital, better infrastructure, institutions, and industrial investments (McMillan, Rodrik, & Sepulveda 2017). Institutions with developed inter sectoral integration system, more competitive product markets, and greater labour market flexibility experience faster structural changes (Hasan et al. 2013). That is why structural change is an important aspect to trace the transformation process.

Generally, we see structural change in the positive direction only (growth enhancing) but a structural change could be either growth-enhancing or growth reducing. It is found that in most of the developed and developing countries like Asian counties, the structural change has been

growth-enhancing, while in case of Latin American and African countries such as - Argentina, Brazil, Nigeria, and Zambia it is “growth reducing” (Ahsan & Mitra 2017; Mcmillan, Margaret S & Rodrik 2011; McMillan et al., 2014). Such trends could be possible because of the benefits driven by the globalisation among the developed and developing countries compared to the most backward countries.

Moreover, rural to urban migration is also a driving factor of structural change and economic development (Taylor & Martin, 2001; Foster and Rosenzweig, 2008). Characterisation of rural and urban dichotomy has no difference in India than the world economy. Unlike the Western experience, said by Lewis and Todaro models, the intra-rural migration is more prominent in India. With the intra-rural migration, male migration from farm to non-farm activities is more prominent, in addition to the feminisation of agriculture in rural region (Binswanger-Mkhize, 2013). Such intra-rural migration could be inter-state, like lots of Bihari rural labour migrate to Punjab and Haryana, to work in agricultural operations. Recently, along with male-migration, even female workers have become more mobile towards village activity, for agricultural and non-agricultural works. And the remittances sent by male migrant have become substantive in upgrading the rural living standards, in addition to the agriculture growth with female employment (Sharma & Rodgers, 2012; 2015).

A prominent trend that is observed in the last one decade in India is the decline of female labour participation in agriculture as well as non-farm. While education could be an important factor, some scholars have attributed this to improvement in household income, which led to ‘housewifization’ –a process of removal of female labour from employment and make them housewife to look after the young and the old people. This is not only true for all India, but also for Bihar.

Besides, there are some sectors that have low productivity growth and employment potential other than the primary sector in Bihar. The declining employment elasticity has always been a concern while confirming the jobless growth. Though the construction, trade, hotel, restaurant and banking sectors have enough potential for productivity growth and employment generation in Bihar. It is because of the nature of the occupations demanded in those sectors. The objective of this chapter is to analyse the dynamics of the employment status with the role of structural change in the economic growth of Bihar over the period-s of 1993-94 and 2017-18. Further, we examined the trends of productivity growth and employment growth potential of the economy over the study period- to investigate the impact of the structural change on the productivity growth and economic development at the sectoral level and to determine which sector in the process of structural change is growth enhancing or growth reducing.

6.2 Data Source and Methodology

As we have explained earlier, data of several rounds of employment and unemployment survey and periodic labour force surveys taken from NSSOs. The same data sources have been used in this chapter too.

6.2.2 Employment Elasticity

Employment elasticity estimates is an important tool to estimates the employment generating potential of an economy and the sectors and so for future projection. In the empirical literatures, there are two methodologies used for Elasticity estimates.

1) CAGR Approach

2) Regression Approach

Equations for CAGR Approach is: $E_e = \frac{\Delta L}{\Delta Y} * \frac{Y}{L}$

Equation for Regression Approach: $E_e = \ln L = \alpha + \beta \ln Y$

Here, E_e denotes employment elasticity, while L and Y denotes workforce employed in the particular sector and GSDP for the economy/each sector respectively.

6.2.2. Productivity Decompositions

In this chapter, the decomposition of productivity change has been done by using the *shift-share*²⁵ analysis. This method is widely recognized in several studies (Van Ark & Timmer, 2003; Timmer & de Vries, 2009; Ahsan & Mitra, 2017; Mcmillan, Margaret S & Rodrik, 2011; McMillan et al., 2017). Later change in Productivity has been decomposed into ‘within’ and ‘Structural change’ components to explore the effect of the technological process and the reallocation of labour force among the different sectors of the economy. In this framework,

Total Labour Productivity is measured by:

$$P_t = \sum_{i=1}^n \theta_{i,t} p_{i,t} \quad (1)$$

Here, P_t is total labour productivity in year t , $\theta_{i,t}$ denotes the proportion of total labour employed in sector i at time t , and $p_{i,t}$ denotes labour productivity²⁶ (OECD, 2001) in sector i at time t ; where $i = 1, \dots, 9$. Then, the change in total labour productivity between t and $t - k$ (ΔP_t) can be written as:

²⁵ This is a tradition method used to identify the contribution of structural change in total productivity. In this paper, approach identified by Timmer & de Varies has been adopted.

²⁶ Labour Productivity (₹lakh per workforce) in a given sector has been calculated using the ratio of industry wise GSDP and the workforce employed in the given sector.

$$\Delta P_t = \sum_{i=1}^n \bar{\theta}_{i,t} \Delta p_{i,t} + \sum_{i=1}^n \bar{p}_{i,t} \Delta \theta_{i,t} \quad (2)$$

Here, ΔP_t denotes an overall economy-wide change in productivity. $\Delta p_{i,t}$ and $\Delta \theta_{i,t}$, refers to the change in labour productivity and employment share between t-k and t. $\bar{p}_{i,t}$ and $\bar{\theta}_{i,t}$, denotes average labour productivity and employment share in sector i at time t and t-k.

This decomposition of the change in productivity has two terms:

* The first term indicates the contribution of “*within sector productivity growth or technological progress*” effect to the overall productivity change.

* However, the Second Term “*Structural change*” captures contribution in overall productivity change due to the movements of labour forces across the sectors.

If the structural change component is positive in this decomposition, it means that there is a positive correlation between the changes in employment share and productivity level. So, such an effect will increase economy-wide overall productivity growth.

Moreover, several indicators measure structural change indices between two points in time²⁷. Modified Lilien Index (MLI) is a modified version of the Lilien Index, as pointed out by Stamer that Linin Index violates conditions specified²⁸ for measures of speed of structural change (Dietrich, 2012; Stamer, 1998). Therefore, Stamer modified the Lilien Index so that this index can fulfil all conditions specified. The Modified Lilien Index has also used to measure the degree of structural change, and the specification is presented below:

$$MLI_{t,t-k} = \sqrt{\sum_{i=1}^n X_{i,t-k} * X_{i,t} \left(\ln \frac{X_{i,t}}{X_{i,t-k}} \right)^2}, \quad X_{i,t-k} > 0, X_{i,t} > 0 \quad (3)$$

Here, $X_{i,t-k}$ & $X_{i,t}$ Denote the share of sector i at time t and t-k. In this paper, the Structural Change index has been calculated for several period-s of interest using MLI due to its specific properties and clarity. This index has some significant properties as if the index is equal to zero; it means the sectoral composition of either income or employment is unchanged, whereas the index value of one resembles a complete change or transformation and structural change is in the process if values lie in between one and zero.

²⁷ Norms of Absolute Value and Lilien Index are also used to measure the Structural Change index (SCI).

²⁸ See (Dietrich, 2012; Stamer, 1998) for details.

6.3 Employment Elasticity Estimates

Demographic dividend is a major challenge in India as well as in Bihar amid growing working age population during last decades. Considering the size of labour market employment intensive growth is conducive in overall development process. While analysing the nexus between the employment and growth, employment elasticity is a major tool that access the employment generating capacity of an economy within a given time period-s. The nexus between employment and growth has many implications, as it act as a driving force for poverty reduction and raising the standard of living of the population. A growth induced employment generates employment opportunities for all as well offset the sustainable and inclusive growth. In Indian economy, higher unemployment rates during late 1970s and 1980s challenged the development planners to consider employment as specific issues in the development agendas (RBI, 2014). To increase the employment generating capacity in the economy, several policies were formulated since inception of the economic reforms in late 1990s. Later, the discourse within academic spaces were started to discuss whether the growth in the Indian economy is job creating or it is just jobless growth.

Employment elasticity is defined and measured in terms of percentage change in employment due to one percentage point change in economic growth within a given period-. There are certain criticisms on this measurement, even though this is an important measurement to understand and assess the employment generating capacity of an economy and the sensitivity of employment opportunities to the economic growth (Islam and Nazara, 2000). The estimates of employment elasticity also help in analysing the employment capacity of each sectors at a disaggregated level. Several empirical literatures endorse two methods of employment elasticity measurement. The methodologies to estimate the employment elasticity are discussed in data and methodology section in details. As it is discussed in the methodology section, the two methods – arc elasticity (CAGR approach) and point elasticity (regression approach) are mostly used in elasticity estimation. The following sub-section provides the estimates of employment elasticity using both approach.

6.3.1 Elasticity using CAGR Approach

Studies found that government economic policies are the major factor that affects the employment elasticity. Specifically the factors include product and labour market reformative policies including wage reforms and economic stability (Crivelli et al, 2012; Pattanaik and Nayak 2010; Mazumdar and Sarkar 2007). The main objective in this section is only to estimate the employment elasticity and the changes over the period-s without investigating the factors causing the changes in Bihar. The only available official source on employment statistics is employment and unemployment

survey of NSSO, which took place in an interval of every five years. Therefore, the CAGR approach is the most used method found in the literatures for the estimation of employment elasticity (GoI, 2012; Papola *et al*, 2012; Rangarajan *et al*, 2007). I have also used the same approach to calculate the sector wise estimates of employment elasticity for four period-s and two regimes for Bihar as presented in table 6.1. It is explicit from the table that the overall employment elasticity is continuously declining from 1993-94 to 2017-18. The employment elasticity has dropped at 0.00 in period- 4 (2011-12 to 2017-18) from the highest of 0.49 in period- 1 (1993-94 to 1999-00). The sharp decline is observed since 2004-05, while the elasticity declined by 0.15 points between period- 1 and period- 2. As per RBI, the lowest ever elasticity estimates of 0.01 is between 2009-10 and 2011-12 for India (RBI, 2014). Taking regimes into consideration, the employment elasticity drastically fell down by 0.39 points in regime2 compared to 0.42 in regime 1. In a long period- of twenty seven years from 1993-94 to 2017-18, employment elasticity is 0.16 which indicates that for every 10 percent growth in output, employment increased by 1.6 percent.

Table 6.1 Employment elasticity using CAGR approach

Periods / Sectors	1993-94 to 1999- 00	1999-00 to 2004- 05	2004-05 to 2011- 12	2011-12 to 2017- 18	1993-94 to 2004- 05	2004-05 to 2017- 18	1993-94 to 2017- 18
Agriculture	1.27	0.18	-0.41	-2.16	0.38	-0.96	-0.43
Mining	1.51	0.94	-0.14	-0.28	-5.58	-0.19	0.00
Manufacturing	3.79	0.10	-0.09	0.59	4.29	0.32	0.77
Electricity	-1.53	-1.71	-2.00	3.85	-1.68	0.14	-0.63
Construction	1.18	1.17	0.96	2.97	1.18	1.18	1.18
Trade/hotel	0.94	0.62	0.19	0.78	0.73	0.38	0.54
Transport	1.07	2.78	0.15	0.54	1.59	0.30	0.63
Finance/estate	1.43	0.76	0.95	4.86	1.17	1.87	1.58
Public Admin	-0.27	-1.91	0.13	-2.95	-0.95	-0.58	-0.75
Other service	-0.07	0.47	1.16	0.43	0.00	0.72	0.46
Primary	1.25	0.18	-0.41	-2.14	0.39	-0.95	-0.43
Secondary	1.84	1.07	0.64	1.17	1.59	0.80	1.03
tertiary	0.43	0.87	0.37	0.82	0.62	0.54	0.57
GSDP	0.49	0.34	0.04	0.00	0.42	0.03	0.16

Sources: Author's estimation.

The sectoral employment elasticity presented in the table implicates the diverse employment generation capacity among the sectors over the period. Over the period of 1993-94 to 2017-18, all of the sectors has positive employment elasticity except only three sectors – agriculture, electricity and public admin. . This implies that the employment opportunities has declined by 4.3 percent, 6.3 percent and 7.5 percent due to 10 percent change in the output of agriculture, electricity and public admin. The sector of highest employment generating capacity is finance/estate followed by construction. Interestingly, the employment elasticity for primary sector has experienced massive decline across four period-s. In period- 1, the potential for employment generation in primary sector is positive, which turned into negative by period- 4. Employment elasticity for secondary sector first declined from 1.84 in period- 1 to 0.64 in period- 3, and dramatically increased to 1.17 in period- 4. This increase in the employment generating capacity among secondary sector is because of the significant increase in the employment elasticity for construction sector only. Among tertiary sector, the maximum elasticity is observed in period- 2, while the elastic is increased by 0.39 points from 0.43 in period- 1 to 0.82 in period- 4. All of the sectors contributed positively (except public admin.) among tertiary sector in period- 4, while two sector – public admin and other services have negative employment elasticity in period- 1. It should be noted that, the highest growth period- observed is period- 3 ranging from 2004-05 to 2011-12, where four sectors has negative employment elasticity. A negative employment elasticity also indicates that the workers in those sectors are moving out to more productive sectors or that sector is being heavily mechanized.

6.3.2 Elasticity using Regression Approach

Apart from CAGR approach to elasticity estimations, a regression method is also used to estimate elasticity that is known as point elasticity. The regression approach is highly recommended for a long term time series data. Due to unavailability of a yearly time series data on employment statistics in India as well for states like Bihar, we have used the same NSSO periodic estimates of employment figures and some interpolation of the employment statistics has been performed to get the time series data on employment. To do so, firstly, the annual growth rate of the worker participation rate (WPR) is calculated using compound annual growth rate between each of the available employment figures in their respective survey rounds. Secondly, the WPR is estimated using the CAGR for each of the missing years between two period-s. Third and lastly, the estimated WPR were multiplied with the corresponding population estimates²⁹ to get the employment figures for each years.

²⁹ The population figures for each year were derived from the projected population figures form census of India, 2011.

Table 6.2 Employment elasticity using CAGR approach

Sectors	1993-94/2004-05	2004-05/2017-18	1993-04/2017-18
Agriculture	0.178**	-0.701***	-0.353***
Mining	0.239	-0.075***	-0.103*
Manufacturing	0.672*	0.299***	0.380***
Electricity	-1.814***	0.18	-1.037***
Construction	1.017***	1.192***	1.020***
Trade/hotel	0.667***	0.348***	0.498***
Transport	1.386***	0.284***	0.526***
Finance/estate	1.152***	1.731***	1.296***
Public Admin	-0.777***	-0.401**	-0.663***
Other service	-0.011	0.685***	0.591***
Primary	0.177**	-0.684***	-0.350***
Secondary	1.068***	0.821***	0.819***
Tertiary	0.592***	0.524***	0.562***
GSDP	0.389***	0.033***	0.143***

Sources: Author's estimation; Note: ***significant at 1 percent, **significant at 5 percent, *significant at 10 percent.

A regression estimates using a long term series provides most robust estimates. Therefore, the employment elasticity is estimated for two regimes (i.e. 1993-94 to 2004-05 and 2004-05 to 2011-12) and for overall period- from 1993-94 to 2017-18 as shown in table 6.2. In computing elasticity estimates using CAGR approach, statistical significance is not known, while this can be known through regressions. . The estimated employment elasticities are low for most of the sectors than the estimates using CAGR. The percentage changes in employment is highly significant for all sectors except mining (significant at 10 percent level of significance) due to changes in the output growth over 1993-94 to 2017-18. The employment grew by 14.3 percent due to 10 percentage points changes in overall output growth. There is a significant negative growth of employment by 35.0 percent for primary sector, while employment in secondary and tertiary sector significantly grew by 8.19 and 5.62 percent due to 10 percentage points growth in secondary and tertiary sectors.

Moreover, similar to CAGR estimates, finance/estate has the highest employment generating potential followed by construction and transport. The workforce moved from agriculture, mining, electricity and public admin to the higher productive sectors as indicted by the negative employment elasticity for these sectors. The characteristics of elasticity is almost same for all of the sectors as it is in case for CAGR approach. The sensitivity of growth to employment is

insignificant for mining, manufacturing and other services sectors regime 1, while the elasticity is found significant for these sectors in regime 2. Finance/estate is the highly employment generating sector for both regimes where the elasticity has increased by 0.60 points between regimes. The same trend is found for construction sector, while for all other sectors elasticity decreased from regime 1 to regime 2 but remains positive except agriculture, mining and other services sectors. Agriculture sector is an employment generating sector in period- 1 whose employment elasticity became negative in regime 2. For other services sector, the elasticity is 0.685 indicates that the employment increased by 6.85 percent due to 10 percentage points increase in other services output.

6.4 Structural Change: A Productivity Decomposition Approach

In chapter 3 and 5, the structure and the changes in the structure of the income/output and employment patterns over the period-s for the identified sectors were analysed in details. Both chapters have identified and analysed separately the two important component of the economy that are seen as the major drivers of economic growth and development. The current chapter took income and employment together in the analysis of structural change through productivity decomposition approach, the methodology has been taken from [MacMillan and Rodrik \(2012\)](#). The importance of this approach could be understood as that it helps us to understand the role of the technological progress, capital accumulation and the movement of workforce across the sectors in the development process. The method takes productivity growth as an important tool in the process of development, where an increase in the economic productivity derived from two ways – a) an increase in the sectoral productivity due to technological improvement or capital accumulation; and b) an increase in the sectoral productivity due to the reallocation of workforce across sectors.

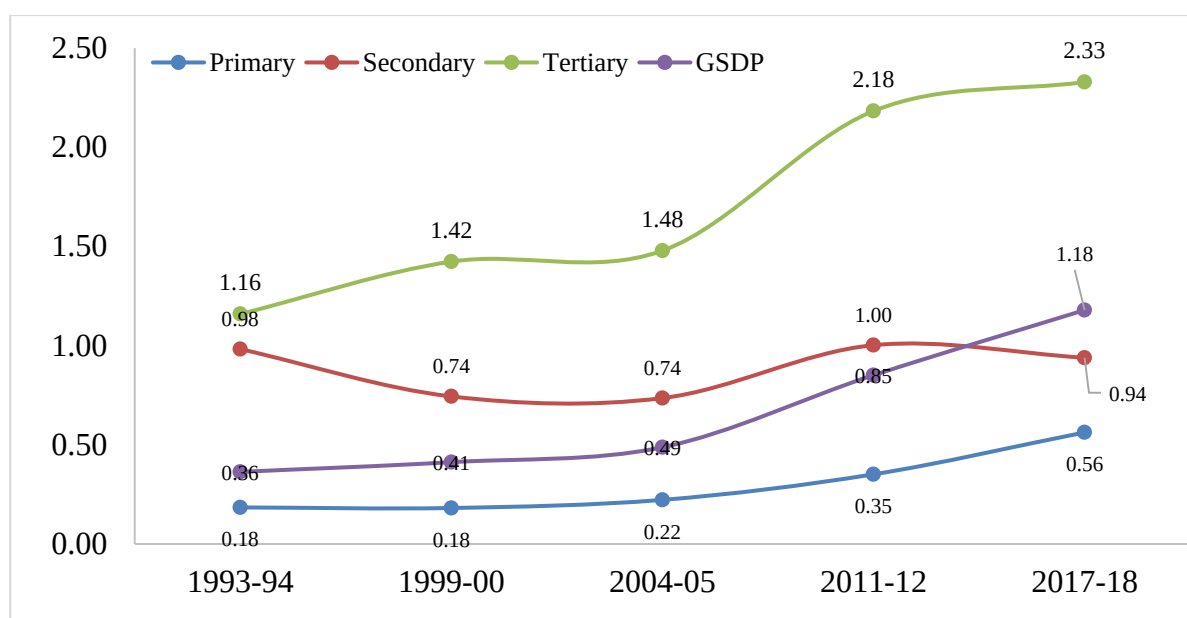
There are an ample studies that focus on nature and the relationship between structural changes and economic growth for Asian, European, and African economies ([McMillan et al. 2017](#); [Foster–McGregor & Verspagen 2016](#); [Vu 2017](#); [Busse, Erdogan, & Muhlen 2019](#)). Moreover, there are very few studies primarily devote to understand the relationship in Indian economy. ([Aggarwal & Kumar, 2015](#); [Aggarwal 2016](#); [Hasan et al., 2013](#); [Mallick, 2017](#); [Thind & Singh, 2018](#)). Previous studies suggest various dynamics of structural changes across the countries and also for Indian states. Further, state-specific studies among the Indian states are mostly done for the developed states like Punjab, Gujarat, and Kerala, etc. but lack a precise analysis for an underdeveloped states like Bihar. Moreover, the study for structural change in Bihar done by [Aggarwal & Kumar \(2015\)](#), [Aggarwal \(2016\)](#), [Thind & Singh \(2018\)](#) are limited to very short period-s and includes undivided

Bihar. Therefore, the following sub-sections explain explicitly the trends of labour productivity and the components of productivity growth in terms of technological improvement and structural change to fill the gap with more in-depth and elaborative analysis

6.4.1 Trends of Labour Productivity

An efficient and optimum utilisation of factors of production is pre-indicative for productivity growth. A productive growth ascertains the availability of more output per capita and thus raises the standard of living in the development process. A productivity analysis consists of many dynamics, and its interpretation depends on the context in which productivity is seen. Therefore, the interpretation of productivity analysis needs to be specific and in the context. In this chapter, the productivity measurement is the ratio of the output per workforce employed. Therefore, the workforce employed and the output produced (overall and in the respective sectors) are the two important components of productivity measurement that influence the productivity of an economy. Usually, a decline in workforce employed or an increase in output enhances the productivity level, as it is because of the inverse relation of productivity to the workforce and direct relation to the income/output. In this continuation, productivity decomposition, as per the above-specified methodology, allows us to understand the nature of output and workforce growth for each sector-specific along with their contribution to overall productivity growth.

Figure 6.1 Trend of labour productivity in Bihar, 1993 -2018



Sources: Author's estimation.

The trends of labour productivity (GSDP, primary, secondary and tertiary sectors) over 1993-94 to 2017-18 are shown in Figure 6.1 through the line graph. The trend reveals an increase in the overall productivity of the economy substantially over the period-. But, the overall productivity

growth over the period- of 2004-05 to 2017-18 is more prominent in comparison to the previous period- of 1993-94 to 2004-05. The overall productivity growth throughout 1993-94 to 2004-05 is only 0.13 points, which markedly grew by 0.69 points for 2004-05 to 2017-18. The service sector productivity has increased more than the primary sector productivity after 2004-05. Whereas in the secondary sector, labour productivity has shown an increasing trend for 2004-05 to 2011-12, but again declines after 2011-12. Further, it is explicit that there is an increasing trends for service and primary sector, while service sector is the most productive and the primary sector is the least productive sector throughout the period-. It should be noted that despite an impressive productivity growth in electricity and output growth in the construction and manufacturing sectors, the overall productivity for secondary sector is declining after 2011-12. Trends in productivity growth for each sectors are presented in appendix in [table A6.1](#).

6.4.2 Structural Change: Decomposition Results

To know the structural change effect in the Bihar economy, the decomposition of the productivity growth has been done to dissect the effect of ‘within sector’s productivity growth or technological improvement and structural change in terms of labour mobility among the sectors in overall productivity growth for the economy. [K.M. Vu \(2017\)](#) explains the significances of expanding (positive) and shrinking (negative) sectors in terms of workforce and trends for within productivity and structural change in the overall productivity growth. If a sector’s both productivity growth and structural change components are expanding, it means that the sector is booming, whereas a sector experiences significant restructuring when a sector found shrinking work forces, but when productivity growth is increasing, given the condition that the effect of the latter outweighs the former. In the third scenario, a sector may experience declining productivity and expanding labour share, given the condition that later outweighs the former effect. This happens due to a rapid increase in market demand for its product and services in the realm of stagnant technological improvement. Other than the three conditions specified previously are not desirable for an economy due to its negative contribution towards productivity growth.

[Table 6.3](#) presents the contribution of each sectors in the overall productivity growth for several period-s and regimes over 1993-94 to 2017-18. The productivity analysis shows that Trade, Hotels and Real Estate is the highest contributor to productivity growth followed by finance/estate over 1993-94 to 2017-18 and also the similar positions were held by both sectors in regime1 and regime2. However, the percentage share in productivity growth is lesser in regime2 compared to regime1 for both sectors. On the other hand, mining, electricity and public admin sectors contributed less than 5 percent over the periods. All of the sectors contributed positively to

productivity growth except primary sector between 1993-94 and 1999-00 while taking three broad sectors into consideration. Among primary sector, the contribution of agriculture to productivity growth is continuously declining over the periods since 1999-00. Tertiary sector contributed the most in productivity growth among all periods and regimes, while primary sector contributed the least among all periods except period- 2. In period- 2, secondary sector were the least contributor to productivity growth.

Table 6.3 Percentage contribution of the sectors in the overall productivity growth

Sl. No.	Sector	1993-94/1999-00	1999-00/2004-05	2004-05/2011-12	2011-12/2017-18	1993-94/2004-05	2004-05/2017-18	1993-94/2017-18
1	Agriculture	-19.48	32.53	15.27	10.45	12.02	12.98	12.84
2	Mining	0.54	-0.47	0.11	0.15	-0.07	0.13	0.10
3	Manufacturing	4.08	-5.35	5.07	17.17	-1.63	10.81	8.92
4	Electricity	8.37	-2.19	1.29	1.43	1.97	1.35	1.45
5	Construction	12.94	13.97	19.11	5.14	13.57	12.49	12.65
6	Trade/hotel	14.38	43.90	20.17	18.24	32.25	19.25	21.23
7	Transport	10.42	2.35	10.27	15.88	5.53	12.93	11.81
8	Finance/estate	25.61	12.17	17.62	9.87	17.47	13.94	14.48
9	Public Admin	8.57	4.17	4.13	1.77	5.91	3.01	3.45
10	Other service	34.56	-1.07	6.96	19.91	12.98	13.10	13.09
	GSDP	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1	Primary	-18.93	32.06	15.38	10.59	11.94	13.11	12.93
2	Secondary	25.40	6.43	25.47	23.81	13.91	24.68	23.04
3	Tertiary	93.54	61.51	59.15	65.60	74.14	62.21	64.02
	GSDP	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Sources: Author's estimation.

Moreover, among secondary sector, the contribution of manufacturing were increased by 13.08 points from 4.08 in 1993-94/1999-00 to 17.17 in 2011-12/2017-18 with a negative productivity share in regime2. The contribution of electricity sector is highest in initial period, while it also contribute negatively in regime2. One of the highest contributor among secondary sector is construction whose contribution were increasing continuously up to 2011-12/2017-18 and declined to the lowest in 2011-12/2017-18. On the other hand, among tertiary sector, only trade/hotel and transport sector's contribution to productivity growth has increased from initial to last period, while the contribution of other sector has declined over the periods. However, the contribution of trade/hotel increased by only 3.86 percent over the periods, while the highest contribution recorded in period-2 and period-3 is 43.90 and 20.17 percent respectively. In case of transport sector, it first declined dramatically from 10.42 in period-1 to 2.35 in period-2 but again start increasing since then. The contribution of finance/estate is first declined in period-2 and later increased but again declined significantly by 7.75 points in period- 4 with respect to its previous

period. Public admin sector has the least contribution among tertiary sector and also its contribution is continuously declining throughout the periods. Lastly, the contribution of other services sector to productivity growth has declined over the periods even though other services is the highest contributor among all sectors in both period-1 and period-2, while it has also recorded negative contribution in period-2.

Overall, it is found that the sectoral contribution in the productivity growth varies widely across the period-s and it don't exhibit any specific trends. However, the effect of public investment and capital accumulation can be observed through the highest contribution of the trade/hotel and finance/estate followed by construction and agriculture in the overall productivity growth of the Bihar economy. Interestingly, the impact of the expansionary policy starting from 2004-05 has positively affected the manufacturing sector after 2011-12 with the increment in the contribution in the productivity growth.

Moreover, the productivity decomposition in 'within productivity (WP)' and 'structural change (SC)' component discussed in figure 6.2. The first bar graph depicts the share of WP and SC in the overall change in the productivity across period-s and regimes. It is explicit that the in the overall productivity growth the share of WP and SC is almost equal to half, where SC has marginally less share by 1.42 percentage points than WP over 1993-94 to 2017-18. This implies that the economy may have experienced productivity growth more due to the improvement of better infrastructure, technological advancement, capital accumulation, and government expenditure within the sectors rather than a much reallocation of labour forces. [Thind \(2018\)](#) also found a similar trend in the case of all India level. However, in case of Bihar, from 2001 to 2010, more than 74 percent share in growth is contributed by only four sectors- Agriculture & Allied, Construction, Trade, hotels and restaurant, and Communication, with the highest share of Trade, hotels, and restaurant ([Gupta, 2010](#)). In a similar study at all India estimates using the same methodology for the period- of 1987 to 2009, authors found that Bihar has the lowest (last rank) contribution of structural change to aggregate labour productivity among the major states. However, in that period-, labour productivity for the construction sector is higher than the agriculture sector ([Hasan et al., 2013](#)). But here, it is important to note that finance/estate followed by construction and trade/hotel are the most significant sectors whose positive structural change contribution to overall productivity growth is higher than other sectors.

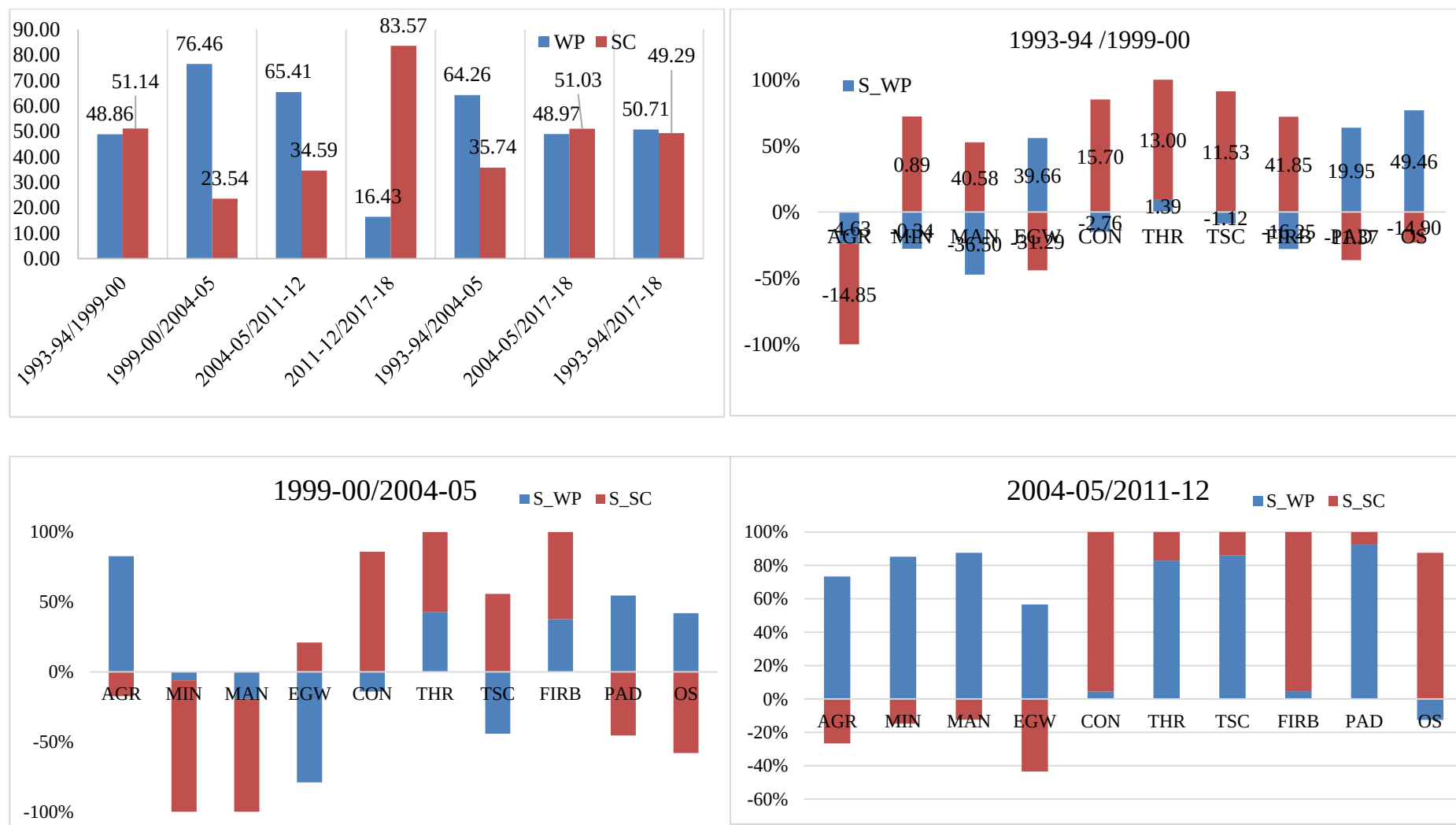
Taking into consideration the period/regime wise analysis, it shows that the SC component is marginally higher in regime2 compared to WP, while SC is significantly higher by 15.39 percentage points from 35.74 percent in regime1 to 51.03 percent in regime2. The highest share of SC and WP is recorded during period--4 and period--2 respectively and vice-versa. The contribution of

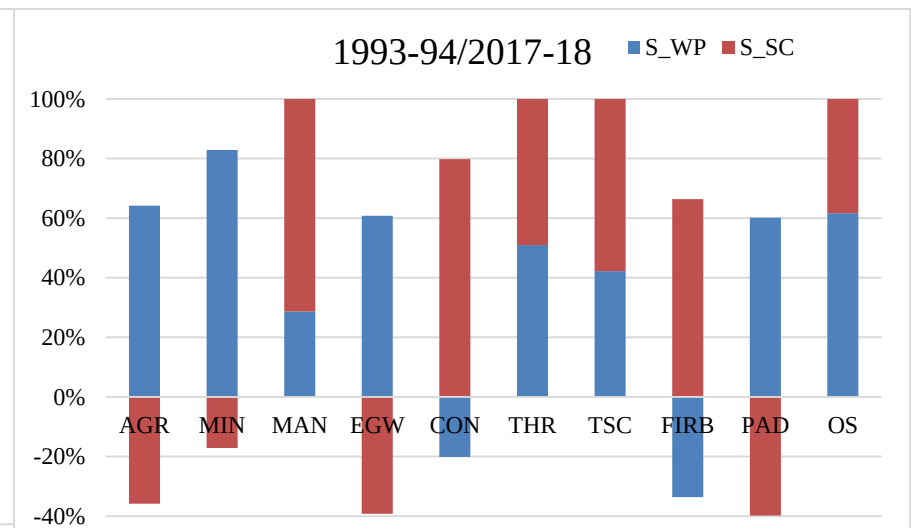
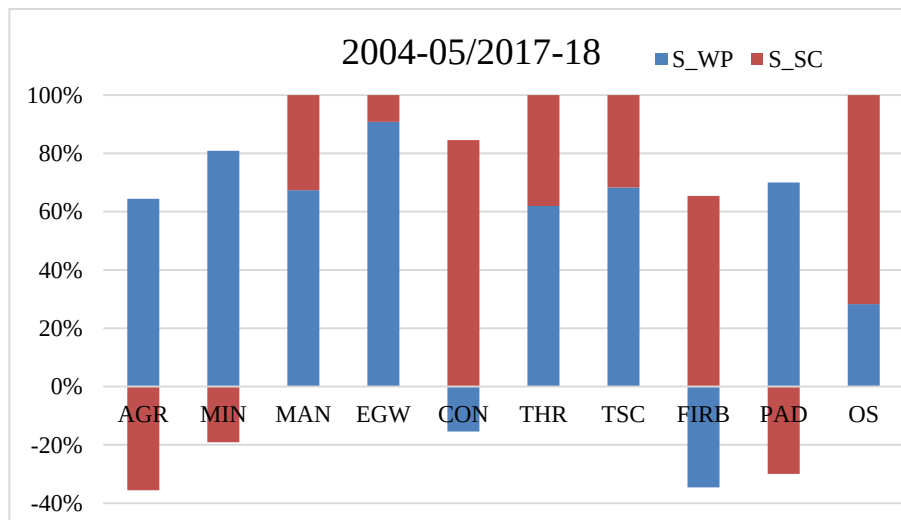
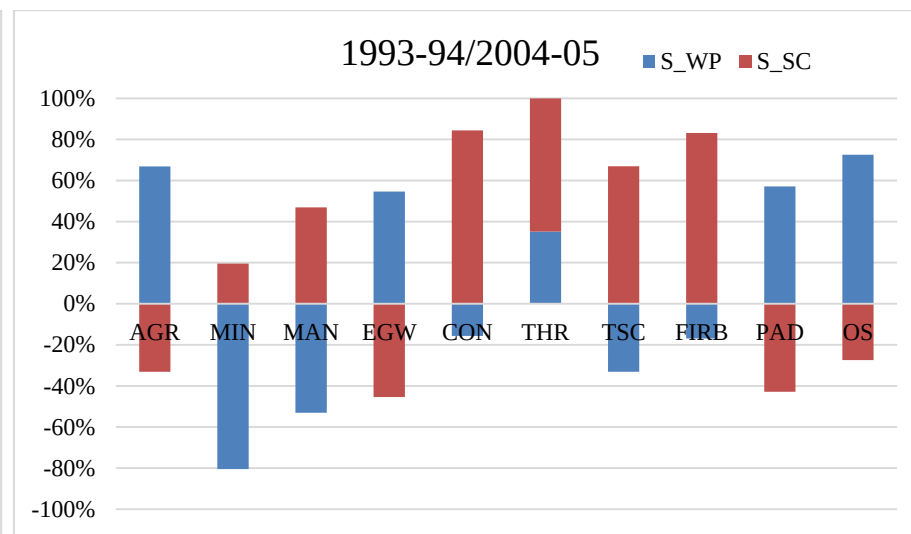
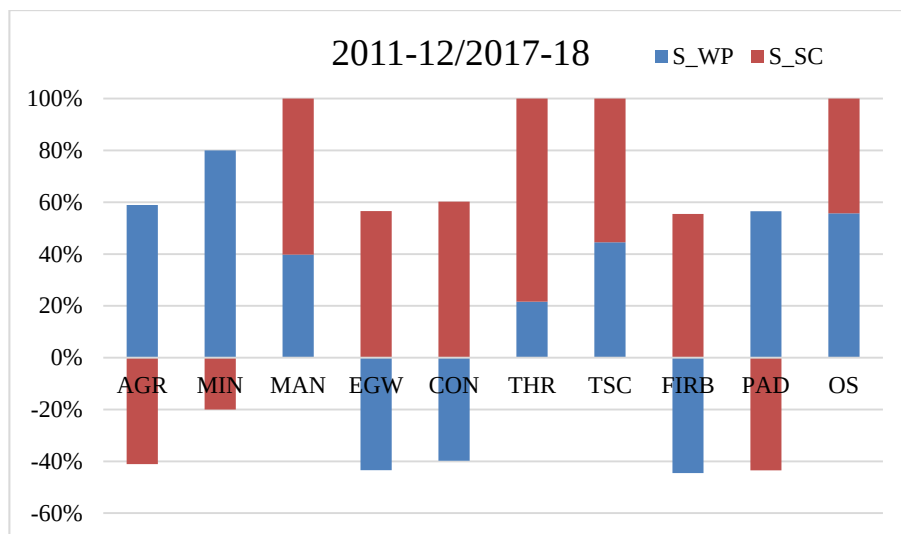
SC is increased by 32.43 percentage points from 51.14 in period-1 to 83.57 in period- 4, while its share has gone down to 23.54 percent in period--2 and since period-2 its share itself was increasing. However, such results are apparent and expected due to the increase in government expenditure towards social sectors, i.e., education, health, roads, electricity as reported on various economic survey reports published by the government of Bihar. Such changes are commendable in the way that they enhance the economic activities and thus translate into economic growth. Chand (2011) argued that Bihar has a significant low productivity problem in absolute and relative terms to other Indian states before 2004-05, possibly due to low human capital and investment.

Further, negative contribution of the structural change component in any sector denotes that the labour force has *moved out* from that sector towards the higher productive sectors. Whereas, a positive within-sector productivity growth implies a productivity growth due to (embodied) technological improvements, infrastructure development or investment in the factors of production. As we have discussed, in the process of development the workforce from the less productive sectors reallocate to the higher productive sectors. Also we know from the literature that the primary sector is deemed to be least productive among all sectors. Therefore it is expected that the workforce would move out from primary sector and absorb into other sectors. The same trend is evident in case of Bihar also, where the contribution of SC is negative for agriculture over 1993-94 to 2017-8. Apart from primary sector, two sectors from non-farm sectors namely – electricity and public admin also have negative contribution for SC. However, the contribution to overall productivity is positive, it is because the WP growth is higher than the SC growth.

The productivity growth in primary sector is observed at all India level too, where several researchers found that apart from labour reallocation better infrastructure such as - irrigation facilities, certified seeds, capital accumulation, and farm mechanization could be the possible reasons for the increase in the overall productivity (Hoda, Rajkhowa, & Gulati, 2017). As we can observe in case of Bihar too, the contribution of WP is higher than SC among period-s except period-1. As we have discussed, there is a negative contribution of agriculture in overall productivity growth and so that is due to the negative contribution of both SC and WP for agriculture in period-1. The mining sector contributes the least in Bihar output, even though the WP is much higher than the SC since 2004-05, while there is negative WP in regime1.

Figure 6.2 Percentage share of within productivity and structural change component in total productivity growth for 1993-94/2015-16



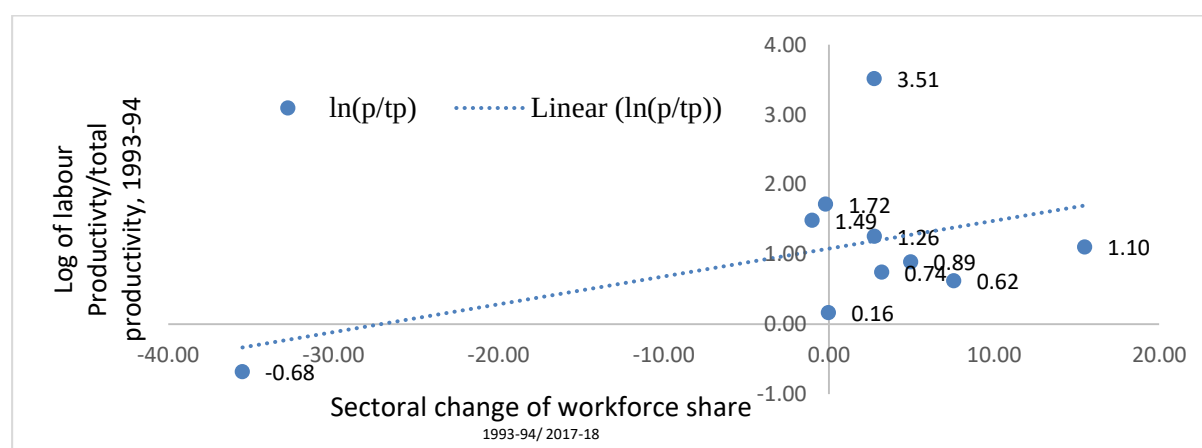


Source: Author's construction using various data.

Among secondary sector, the SC component is positive and higher than WP in period-1 and period-4 only, while in period-2 and period-3 the SC is negative, which indicates that labour have moved out from these sectors in these period-s. The construction sector has only the highest and positive SC components among secondary sector across all period-s. This implies that maximum labour force has reallocated (*moved in*) towards these sectors, but due to limited technology and labour intensive nature of the sector, ‘within’ productivity is negative. The higher demand for labour forces towards the construction sector might be due to the rapid increase in the public and private sector investment in roads, buildings, infrastructures, bridges. In terms of workforce share, electricity sector has also very less workforce compared to other but this sector also has negative SC share in period-1 and period-3 but it increased markedly in period--4.

The contribution of SC for three sectors namely – trade/hotel, transport and finance/estate sectors among tertiary sector are always positive and greater then WP across all periods except period-3. Trade/hotel is the only sector whose, both SC and WP were expanding irrespective of any periods. On the other hand, the workers have moved out from public admin and other services sectors in across all periods as indicated by negative SC for the sectors.

Figure 6.3 Trends of labour mobility across the sector, 1999-00 to 2017-18



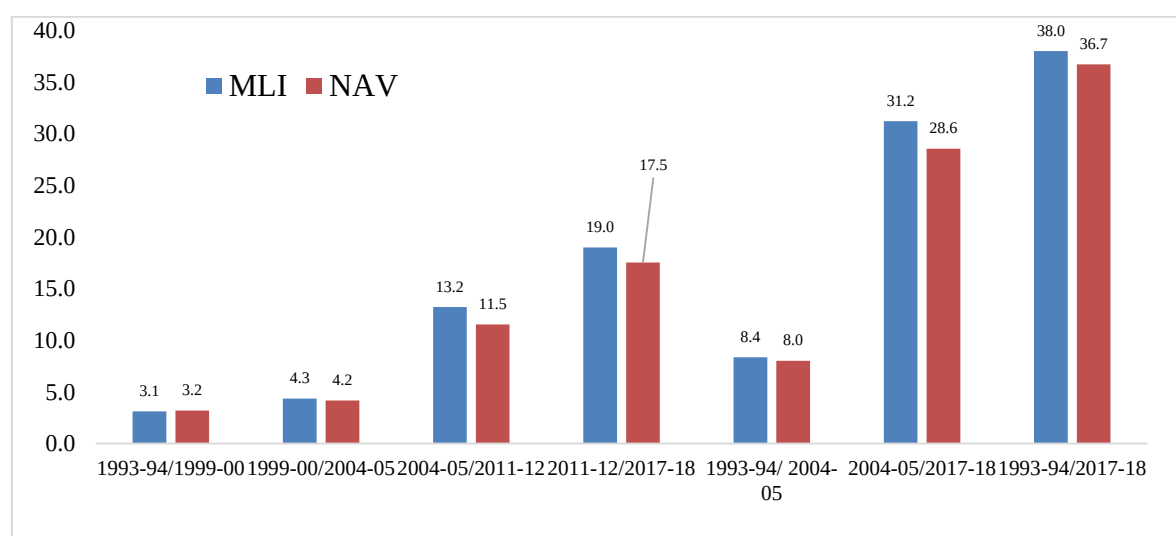
Source: Author's computation.

Overall, the upward mobility of workforce (movement from low to high productive sector) is not only necessary for the productivity growth but also it is important for economic development. Figure 6.3 shows the trend of labour mobility across the different sectors for the overall period-, indicates that there is upward mobility of the labour force. It means labour force is moving towards low to high productive sectors, which is essentially a positive sign for the structural change in the economy. Hence it can be asserted that a surge in economic growth in Bihar contributes positively towards the structural change for the economy. On the contrary, some of the underdeveloped economies of Africa shows negative trends, as pointed out by [McMillan & Rodrik \(2017\)](#).

6.4.3 The Effective Structural Change (ESC) Index

The effective structural change (ESC) index is firstly proposed by [K.M. Vu \(2017\)](#) in his seminal article. This method of measuring structural change is a modification over the existing method of measuring structural change index using Norms of Absolute value (NAV) index. However, later [Lilien \(1982\)](#) developed the norm of absolute index and proposed Lilien index to measure structural change between two points in time. Further [Stamer \(1997; 1999\)](#) examined that Lilien index and found that this method do not fulfill required condition ³⁰ and again proposed and an index known as modified Lilien index (MLI). [K.M. Vu](#) stated that either of the methods of structural change index used previously has a substantive issue that it does not explains whether the structural change occurring in among the sectors were productivity enhancing or productivity decreasing. Hence, [KM Vu](#) proposed this effective structural change index which takes into account only the sectors which contributed positively in the overall productivity growth. Therefore, the ESC is a hybrid of the both the shift-share and the Structural change index (using NAV or MLI). In this section we have also used the same methods used by [K.M. Vu](#) and estimated the effective structural change using both NAV and MLI.

Figure 6.4 Structural change in employment



Source: Authors Computation. MLI = Modified Lilien Index; NAV= Norms of Absolute Values

The bar graph shown in [Figure 6.4](#) presents the measures of NAV and MLI using only the sectors whose contribution to productivity growth is positive over 1993-94 to 2017-18. The ESC measure revealed that there the difference between MLI and NAV estimates is quite similar, while the estimates of NAV is little lower than the MLI estimates. It explicitly shows that the structural change in the economy is increasing over the period-s where the highest structural change is seen

³⁰ See (Dietrich, 2012; Stamer, 1998) for details.

in period-4 followed by period-3. The period- between 1993-94 and 1999-00 shown the least structural change by only around 3.0 points. Similarly, the structural change is 20.6 to 22.8 points higher in regime 2 compared to regime1. Overall the structural change is around 36.7 to 38.0 points over 1993-94 to 2017-18.

6.5 Conclusion

The decline in employment elasticity in the last decade suggests a jobless growth in the Bihar economy, though the employment elasticity is greater than '1' for only two sectors namely – construction and FIRB and also it is higher in 2004-05/2017-18 compared to 1993-94/2004-05. This indicates that the growth in these two sectors are generating enough impulse for employment opportunities. However, the labour productivity has increased by 3.28 times over 1993-94 to 2017-18, in which productivity grew by 73.17 percent only between 2004-05 and 2017-18. The service sector productivity growth has increased by 2.0 times, while the productivity has decreased in secondary sector. The structural change analysis suggests the movement of the workforce from low to high productive sector with an equal contribution of the technological growth and workforce movement across the sectors in overall productivity growth.

Moreover, considering the productivity decomposition across the four periods, the contribution of the structural change in the productivity growth is higher than the within-productivity growth in 2011-12/2017-18 and also in 2004-05/2017-18. The patterns of the contributions of structural change and technological growth differed across the periods of analysis. Agriculture sector has the highest negative structural change in the initial periods but in the later periods the within productivity growth superseded the structural change effects. Construction is the most labour intensive sector, where most of the work force were reallocated from the agriculture sector, while the growth rate of the construction sector is the highest but it has comparatively lesser contribution to the overall productive growth in 2004-05/2017-18. It is because of the sharp decline in the workforce and growth rate between 2011-12 and 2017-18. Additionally, the contribution of 'within' productivity growth for Construction is very less possibly due to limited technological improvement. Therefore, based on the recent trends, it seems that the construction sector is no longer the most productive sector. Trade/hotel followed by finance/estate is found to be highest contributor in productivity growth in the both regimes. The effective structural change index for structural change in the employment also shows that the structural change in the economy is increasing over the periods, whereas the highest structural change is observed between 2011-12 and 2017-18 followed by the former period. Lastly, the empirical estimation confirms that there is a statistically significant less changes of

employment in the primary sector compared to a higher chances in secondary and tertiary sectors after controlling socio-economic factors. The probability of less chances for primary sector is maximum in rural region, while the gain in secondary sector is higher in urban sector. It indicates the varying nature of employment patterns in rural and urban regions.

In a nutshell, the employment structure has changed over the period-s due to a significant fall in primary sector workforce and gain the secondary and tertiary sectors. The overall productivity has risen due to rise in the capital formation between 2004-05 and 2011-12 and structural change between 2011-12 and 2017-18. . On the hand, jobless growth is evident, yet the workforce is moving from the low productive sectors to the higher productive employment sectors lead to the structural change and economic growth in the Bihar economy. The stagnation in the manufacturing sector has a matter of concern despite a commendable share in productivity growth in the last period. Thus our analysis partially validate the hypothesis of significant role of capital formation in productivity growth. We found that the growth in Bihar is accompanied by a degree of structural change (2011-12 to 2017-18) and capital formation (205-06 to 2011-12) both of its economy.

Appendix

Table A6.1 Productivity trends of the sectors over 1993-94 to 2017-18

No.	Sector	1993-94	1999-00	2004-05	2011-12	2017-18
1	Agriculture	0.18	0.18	0.22	0.35	0.56
2	Mining	0.43	0.32	0.30	0.85	1.71
3	Manufacturing	0.89	0.55	0.54	0.90	1.21
4	Electricity	2.02	12.76	9.94	46.50	19.90
5	Construction	1.09	0.98	0.89	0.93	0.69
6	Trade/hotel	0.68	0.69	0.86	1.46	1.57
7	Transport	1.28	1.24	0.94	2.10	2.75
8	Finance/estate	12.19	10.43	11.04	11.38	5.21
9	Public Admin	1.61	2.28	4.05	5.75	9.29
10	Other service	0.76	1.31	1.36	1.28	1.79
11	GSDP	0.36	0.41	0.49	0.85	1.18

Source: Author's estimation

Chapter 7

Migration and Remittances: A Critical Resource of Bihar

7.1 Introduction

Migration is an integral part of structural change and development. Development process is said to be unequal, given the socio-cultural, political and resource differences. Farm ward regions are capital rich and labour scarce, hence would attract labour from backward regions. Bihar had been a source of labour migration for centuries. During colonial times, indentured labour were mobilized from Bihar to West Indies, Fiji and Mauritius. Bihari labour were mobilized for tea gardens in Assam. In Green Revolution period of the post-Independent period, migrant Bihari labour toiled in agricultural fields of Punjab and Haryana. While labour migration to these have vanned, there is an ever increasing magnitude of migration to construction sector in all major cities from North to South India, manufacturing sector, rural-non-farm sectors in other states from Bihar ([Aajeevika Bureau et al., 2016](#)). And the remittances of migrants play a significant role in spawning development in the origins. So far, in the earlier chapters, we have referred to growth as mostly internal entity without considering its external links. It would be a mistake to ignore the role of migration and remittances in Bihar's growth process. In this chapter, we shall undertake this aspect to complete our argument.

Though migration has both push and pull factors ([Ravenstien, 1879](#); [Lee, 1966](#); [Peterson, 1958](#)), as it can be observed in case of Bihar, the economic backwardness in the origin and non-availability of employment at the destinations has always been the prime reasons of migration. On the other hand, better employment prospect, high wage rate and improved standard of living at the relatively developed areas always attract migrants.

Moreover, migration plays an important role in the structural change and development in the both the migrant sending and receiving regions. Remittances act as an evincive factor in alleviating poverty and upscaling living standard in the migrant sending regions ([Haas, 2006](#)). On the other hand, migrant receiving regions are benefitted with low-cost labour power ([Sharma, 1997](#)). Generally, the flow of migrants in search of employment from rural regions to urban region is well established in literature. In the migration and development literatures, the dichotomy of rural-urban, and developed – underdeveloped, and migrant sending – migrant receiving regions are usually used synonymously. However, three more streams of migration are observed apart from rural to urban migration such as – rural to rural, urban to urban and urban to rural ([NSSO, 2007](#)).

The flow of migrants other than rural-urban streams has several other reason of migration in which marriage of the female plays an important role (Census, 2001, 2011). Although migration other than employment related activities does not bring any remittances and therefore has no direct role in the economic growth.

Internal migration and out-migration are the two broad dimensions of Migration identified in the literature. In India, census and NSSO are the only two official agencies which define and publish migration parameters and statistics. According to the NSSO, “a household member whose last usual place of residence (UPR)³¹ is different from the present place of enumeration is considered as migrant”. Generally, such migrants identified in a given boundary of the region are called internal migrants. On the other hand, out-migration is “any member of a household who left the household any time in the past, for stay outside the village/town provided he/she is alive on the date of survey” (NSSO, 2007). Therefore, in case of Bihar, migration can be understood in both way – internal migration and out-migration. Further, within these two dimension various stream of migration can be analysed.

Theoretically, the migration theories can be broadly classified into two categories – firstly, the theories explains the cause and determinants of migrations and answers the questions - why people migrate? Such theories explained the reasons of migration are classified as initiation theories of migration. De Haas (2010) identified several views on the relation between migration and economic growth, such as - the migrations Optimists who favours the positive role of migration on economic development, and migration pessimist who believe that migration has negative impact on the economic development. The major initiation theories of migrations can be clubbed into the neoclassical theories of migration, Segmented/Dual labour market theory, World System theory, and new economics of labour migration (NILM) (Lewis, 1954; Ranis and Fei, 1961; Harris and Todaro, 1969, 1970; Todaro, 1976; Jones, 2009; Massey et al., 1998; Mincer, 1978; Bloom, 1985; Wallerstein, 1974; Frank, 1966). On the other hand, the perpetuation theories of migration (included Network theory, Institutional theory and Causation theory of migration) concentrates on the process of migrations apart from the reasons of migrations. It also explains how the migration flourishes over time and space, ones people decided to migrate (Massey et al., 1993; Dekker & Engberson, 2014; Glitz, 2013; Haas, 2010; Myrdal, 1975)

In addition, remittances being an integral part of migration, have uplifted living standards of millions of households across the world. In Bihar too migration can be seen as a historical

³¹ UPR of a person is defined as a place (village/town) where the person had stayed continuously for a period of six months or more.

phenomenon where migrants from Bihar are found across the globe. However, the major chunk of migrants are residing in the relatively developed states of India and send remittances (Kumar & Bhagat, 2012). The main objective of this chapter is to understand the nature and extent of migration and analyse the role of remittances in improving the living standard of the households in Bihar. The migration pattern also vary across social groups, region and gender of the migrants. Therefore, we further analysed the impact of migration and remittances across dimensions of regions, gender and social groups of the migrants to understand how migration benefits to different strata of the residence in Bihar in the process of structural change. Hence, taking into account various factors of migration there are two specific objectives in this chapter a) to understand the nature and extent of migration in Bihar; and b) to analyse the impact of remittances on the living standard of the households in Bihar across the social-groups taking into account the region and gender of the migrants.

This chapter is further divided into six sections – section 6.2 presents the data and methodological part of the chapter; various dynamics of migration such as – type, streams and reasons of migration have been discussed in section 6.3; section 6.4 presents the role of remittances in the livelihood of migrant households and its impact on socio-economic characteristics of the migrants; the empirical estimation are done in section 6.5 to understand the difference between migrant and non-migrant households and the role of remittance on migrant households upon controlling for the various socio-economic factors; finally, section 6.6 concludes the chapter.

7.2 Data Source and Methodology

This chapter used migration survey data carried out by National Sample Survey Office (NSSO) namely – *Employment, Unemployment and Migration Survey 2007-08*. In India, the survey is the only officially available source on the migration particulars which has taken into account various socio-economic factors into account in survey. Apart from this survey, Census also records migration particulars in India, while the both of the surveys have several merits and demerits in the analysis of migration phenomenon. Census survey on migration is carried out in every ten years but it lacks in depth survey on socio-economic factors. On the other hand, the migration survey in 2007-08 is the latest available comprehensive survey by NSSO. The methodological differences and the definitions adopted in both the survey are entirely different and hence cannot be entirely comparable. The data on migration derived from this survey provides us an important insight about the migration particulars in India and Bihar. In this chapter, we have use the results from both the types of surveys for overall understanding, while in depth analysis has been performed using NSS Migration survey. Several variables have been used from the migrations survey such as

– various individual and household characteristics, remittances and monthly consumption expenditure. The survey were carried out in 711 villages of Bihar³² (1.57 percent of all villages) consist a total of 8785 households in which 7106 households were in rural region and 1679 households in Urban regions. A total of 36263 and 8425 persons were surveyed in rural and urban region respectively out of 44688 persons in total. In terms of gender wise survey, 51.52 percent and 52.32 percent male were surveyed in rural and urban regions respectively. Thus, this is not any very very big survey to make statistical projections, but only available big survey, at primary level.

In context of the methodology part, this chapter used various cross section analysis using the survey data along with several tables and figures as required. To analyse the changes in the migration patterns and the dynamics of it is observed using various literature surveys and both NSS and Census survey. Further, the relationship between migration and household development is observed using quantile regression and ordinary least square regression. The methods of estimation for quantile regression has been discussed in details in the last chapter.

7.3 Changing Patterns of Migration

7.3.1 Internal Migration

As we have discussed the statistics on migration show the movement of the persons out of the usual place of residence. Therefore, the place of enumeration is considered as current place and if there is any difference found in both of the position of an individual, such individual are called as migrants (NSSO, 2007). In this case, the migrant data capture rural to urban and urban to rural movement in the same state and the migrants from other states too. Table 7.1 presents the migration rate by region and gender wise from 2001 to 2011. The migration rates are estimated from census 2001 and 2011 along with NSSO migration survey in 2017-18. The survey shows a wide differences in the migration patterns between regions (rural and Urban) and gender (male and female). Taking into account the regional difference, the migration rate shows that the incidence of migration is higher for female compared to male in both rural and urban region, while the large gap between male and female migration rate in rural region indicate that the female are the main stay of in migration from the rural region. The census data shows that the migration rate has been increasing over the periods in each regions for both male and female. Several other scholars pointed out that the NSSO migration statistics in 2007-08 underestimates the migration rates in each category (Tumbe, 2011; Mazumdar, Neetha, & Agnihotri, 2013; Srivastava, 2013). However, the pattern for within the region and gender categories are same as the census estimates.

³² Bihar has 45103 villages.

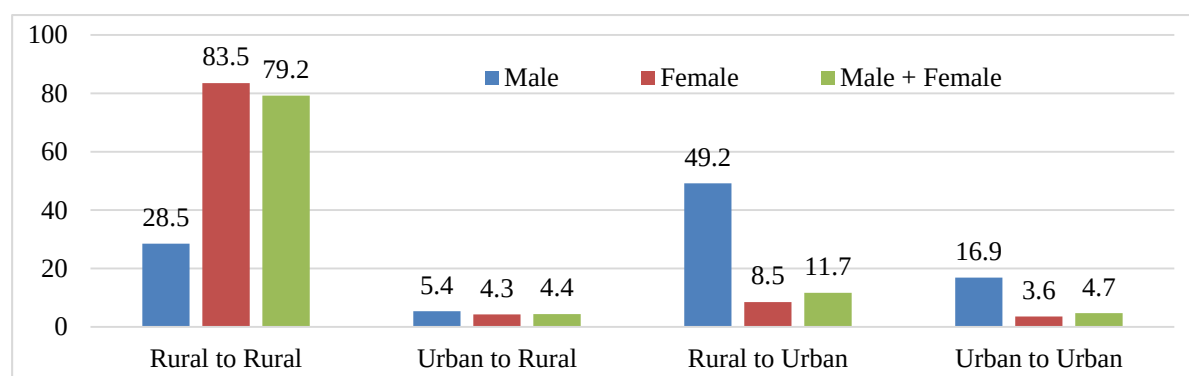
NSSO shows the migration rate for male in urban region is 20.82 percent compared to a minimal of 1.17 percent for male in rural region, while census shows 22.26 urban male migration rate compared to 5.11 male migration rate in 2011. Female migration has also increased marginally over the periods. The differences in the male and female migration depends on several factors, where employment are the main reasons for male migration and marriage is seen as the main part of female migration at all India level. The similar results have been addressed in several literatures on migrations in Bihar (Rodger & Rodger, 2011; Mishra & Datta, 2016). The migration rate indicates the proportion of migration over the population, while the movement of people from one region to another also has specific patterns known as the migration streams.

Table 7.1 Migration rate in Bihar, 2001 to 2011

Sector / Gender	2001 (Census)			2007-08(NSSO)			2011 (Census)		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Male	3.60	18.50	5.20	1.17	20.82	3.10	5.11	22.26	7.07
Female	46.71	38.34	45.86	37.89	49.67	39.01	47.01	46.77	46.98
Total	24.32	27.72	24.68	18.86	34.49	20.37	25.20	33.83	26.17

Sources: Author's estimation from NSSO migration survey, 2007.

Figure 7.1 Migration stream for male and female



Sources: Author's estimation from NSSO migration survey, 2007.

The movement of the people can be traced into four migration streams, namely, rural to rural, urban to rural, rural to urban and urban to urban. These four migration streams have their own importance while tracing the movement between rural and urban. The incidence of migration from rural to rural found to be highest at the aggregate level due to 83.5 percent movement of female compared to only 28.5 percent among males (figure 7.1). As per census 2001, rural to rural accounted for 79.9 percent among the migrants in Bihar. The movement of an individual from rural to urban plays an important role in shaping the urbanization in the economy (Sumita, 2020). However, it is found that the incidence of migration from rural to urban is only 11.7 percent, while

the male migration is 40.7 percentage point higher than female in case of rural to urban stream. This indicate the urban region is the most preferred place of migration for the male. Coming to the urban to rural and urban to urban migration, both streams have the least migration rate, while in case of urban to urban migration, male migration is prominent and higher than fifteen percent. Overall, comparing the four streams of migrations, it is explicit that the gender plays an important role in deciding where to migrate. As it is evident, female migration is higher in rural to rural stream, on the other hand, male incidence of migration is higher from rural to urban stream. The next question comes that why people migrate and why the migration streams are divided on the gender specifications. There are several factors play behind the migration of an individual from one place to another. These factors are discussed into the next sections.

7.3.2 Why People Migrate?

Migration theories assert several factors behind the migration of an individual and its relation with the development in both sending and receiving economies. The migration surveys recorded the motives or main reason of migration of an individual and categories into several categories³³. Similarly, census records the reason of migration into seven categories ([Census, 2011](#)). I have categorised reasons of migration into six broader categories using NSSO schedule of migration survey such as – ‘Employment related, Studies, External Factors, Marriage, Migration of Parents/ Earning members and others’. It is evident that the region and gender have different patterns on migration. Similarly, there are wide differences in the reasons of migration based on the regions and gender of an individual. Table 7.2 presents gender and region wise reasons of migration in Bihar. The nature and reasons of migration of the migrants are explicitly differs based on the place of residence and the gender of the people. As it is seen in the table that marriage is the main reasons of migration for both male and female in rural region, even though more for females; while employment related activities are the prime reason of male migration in urban region. Migration of parents / earning members stood as second prime reason of migration for both male and female in urban region. Several studies and reports suggest the similar patterns for reasons of migration over the periods including census reports of 2001 and 2011 ([Mishr & Datta, 2016](#); [Kumar & Bhagat, 2012](#); [Haan, 2010](#)).

Table 7.2 Reasons of migration

Sector / Sex	Reasons of Migration					
	Employment related	Studies	External Factors	Marriage	Migration of Parents/Earnings	Others

³³ A detailed categorisation of the reasons of migration are presented in the schedule of the NSS employment, Unemployment and Migration survey, 2007-08 ([NSSO, 2007-08](#)).

			Rural			
Male	8.13	2.09	13.85	49.67	8.12	18.14
Female	0.12	0.00	0.39	97.32	0.33	1.84
M + F	0.37	0.06	0.80	95.85	0.57	2.35
			Urban			
Male	36.54	21.4	8.4	1.55	29.75	2.37
Female	2.39	4.98	2.83	63.42	25.19	1.19
M + F	13.26	10.21	4.60	43.72	26.64	1.57
			Rural + Urban			
Male	27.11	14.99	10.21	17.53	22.57	7.60
Female	0.40	0.60	0.68	93.22	3.34	1.76
M + F	2.48	1.72	1.42	87.32	4.84	2.22

Sources: Author's estimation from NSSO migration survey, 2007

Table 7.3 Age-wise urban male migration in Bihar

Reasons of Migration	Age - Groups					Total
	0-14	15-21	22-29	30-59	>=60	
Employment related	2.34	1.58	27.38	70.52	38.26	36.54
Studies	30.96	58.53	24.62	2.90	0.00	21.40
External cause	3.24	0.26	1.48	5.82	60.24	8.40
Marriage	0.00	0.12	2.96	2.82	0.06	1.55
Migration of Parents/ Earning Members	61.80	38.72	42.94	13.68	0.73	29.75
Others	1.65	0.78	0.61	4.27	0.71	2.37

Sources: Author's estimation from NSSO migration survey, 2007

In migration studies, it is found that the reasons of migration changes with the age structure of the migrants. As we have seen that, employment related activities are the main reasons of migration in urban males, though analysing through the structure of the urban male migrants it is found that such reason persists for more than 70 percent migrants of age 30-59 and 27.38 percent in 22-29. However, the estimates also shows that the migration among the older people of age greater and equal to sixty years have higher incidence of migration for employment related activities compared to the younger populations. As shown in Table 7.3, migration of parents/earning members were the prime reasons of migration among 0-14 years migrants followed by studies in the urban reasons. The young age group of 15-21 has the higher incidence of migration due to studies followed by the migration of parents. Surprisingly, around fifty percent migrants of age 22-29 have moved to urban due to migration of earning members, while for each quarter of migrants have

employment and studies related reasons. Employment rated migration is found to be the highest among the migrants of age groups 30-59, whereas external cause were the prime reasons of migration in old age migrants. Overall, employment related activities, study and migration of parents/ earning members were the most significant factors of migration among the urban male. Similarly, Migration of parents/earning members were the main motives of migration in urban females of age below 21 years, while marriage found to be main reason among the urban females of age greater than 21 years. A detailed age wise classification of reasons of migration for rural male and females have been presented in Appendix tables. What is clear is the fact the migration in search of employment is the principle reason that is pertinent to our concern.

7.3.3 Out-migrants

Table 7.4 presents the proportion of out-migrants based on the place of residence of the out-migrants in 2007-08. NSSO captures four broad places of the out-migrants, such as – a) same state and same district, b) same state and other district, c) other state, and d) outside country. In case of out-migrants, more than fifty percent of migrants moved to other state, while only 1.6 percent were migrated to outside country. Upon analysis the patterns for out-migration for male and female of rural and urban region, it is found that male out-migration to other states is much higher than the female counterpart. In contrast, female preferred to move in the same state and specifically to the same district of the state. This is probably due to the marriage of the females in the same district of residence.

However, there is a slight difference in the patterns of out-migrants of rural and urban regions. In rural region, the male out-migration is 85.2 percent to other state compared to only 21.0 percent for female. The movement of out-migrants in the same is recorded to only 12.2 percent for male and 78.5 percent for female. Similarly, in the urban region, male out-migration is lower than the rural region but still 70.9 percent of out-migrants were migrating out of the state. In contrast to the rural region, the proportion of female out-migrants is higher from urban region by 11.1 percentage points. Overall, it is explicit that the movement of the migrants to the other state is a prominent feature of the out-migration in Bihar. Therefore, it is pertinent to understand the nature of out-migration to other state in details as has been done in next section.

Table 7.4 Place of residence of the out-migrants

Sector	Gender	Same state		Other State	Outside country
		Same District	other District		

Rural	Male	5.0	7.2	85.2	2.3
	Female	50.2	28.3	21.0	0.4
	M + F	21.1	14.8	62.3	1.7
Urban	Male	5.2	20.2	70.9	2.3
	Female	24.3	43.1	32.1	0.4
	M + F	13.1	29.6	55.0	1.5
Rural + Urban	Male	5.0	8.0	84.4	2.3
	Female	48.4	29.4	21.8	0.4
	M + F	20.6	15.7	61.8	1.6

Sources: Author's estimation from NSSO migration survey, 2007

Table 7.5 presents the proportion of out-migrants who migrated out of the state using census and NSSO between 2001 and 2011. The table illustrates differences in the rate of out-migrants within and between the regions and sex of the population. The census enumeration shows that out migration has increased between 2001 and 2011 across all sections. Out migration rate has increased by 0.82 percentage points between 2001 and 2011 which added around 2.2 million out-migrants at an average rate of 2 lakh out-migrants per year. In 2001, 3.0 million and 2.2 million out-migrants are male and female respectively, which have increased to 3.9 million and 3.6 million respectively in 2011. The increase in the female out-migrants are higher than the male counterpart. However, it should be noted that the increase in male out-migrants are primarily due to the employment prospect but for the female, marriage and migration of earning members are the prime motives (Das, 2018; Datta & Mishra, 2011). Census 2011 reported a less than one percent of female out-migrated for the employment while 4.14 percentage out-migrants were male for the employment related reasons (see appendix, figure A7.1).

According to the census, out-migration rate from the urban region is higher than the rural and also it has increased over time, while the magnitude of out-migration is much higher from rural than the urban region. The urban region has added around 6 lakh out-migrants over the period of 2001 and 2011, while it is around 1.5 million for rural region in the same period. NSSO estimates of out-migrants in 2007-08 seems overestimation for rural but underestimation for urban region, however, it could be possible due to definitional differences of out-migration adopted in census and NSSO survey.

Table 7.5 Out-migrants of Bihar to other states

Sex	2001 (Census)			2011 (Census)			2007-08 (NSSO)		
	Rural	Urban	R +	Rural	Urban	R +	Rural	Urban	R +
	®	(U)	U	®	(U)	U	®	(U)	U
Male	6.19	10.65	7.05	6.03	12.11	7.10	10.8	6.2	10.4
Female	4.79	9.45	5.56	6.00	13.39	7.23	6.5	4.8	6.3
Male + Female	5.52	10.09	6.34	6.01	12.71	7.16	8.7	5.5	8.4

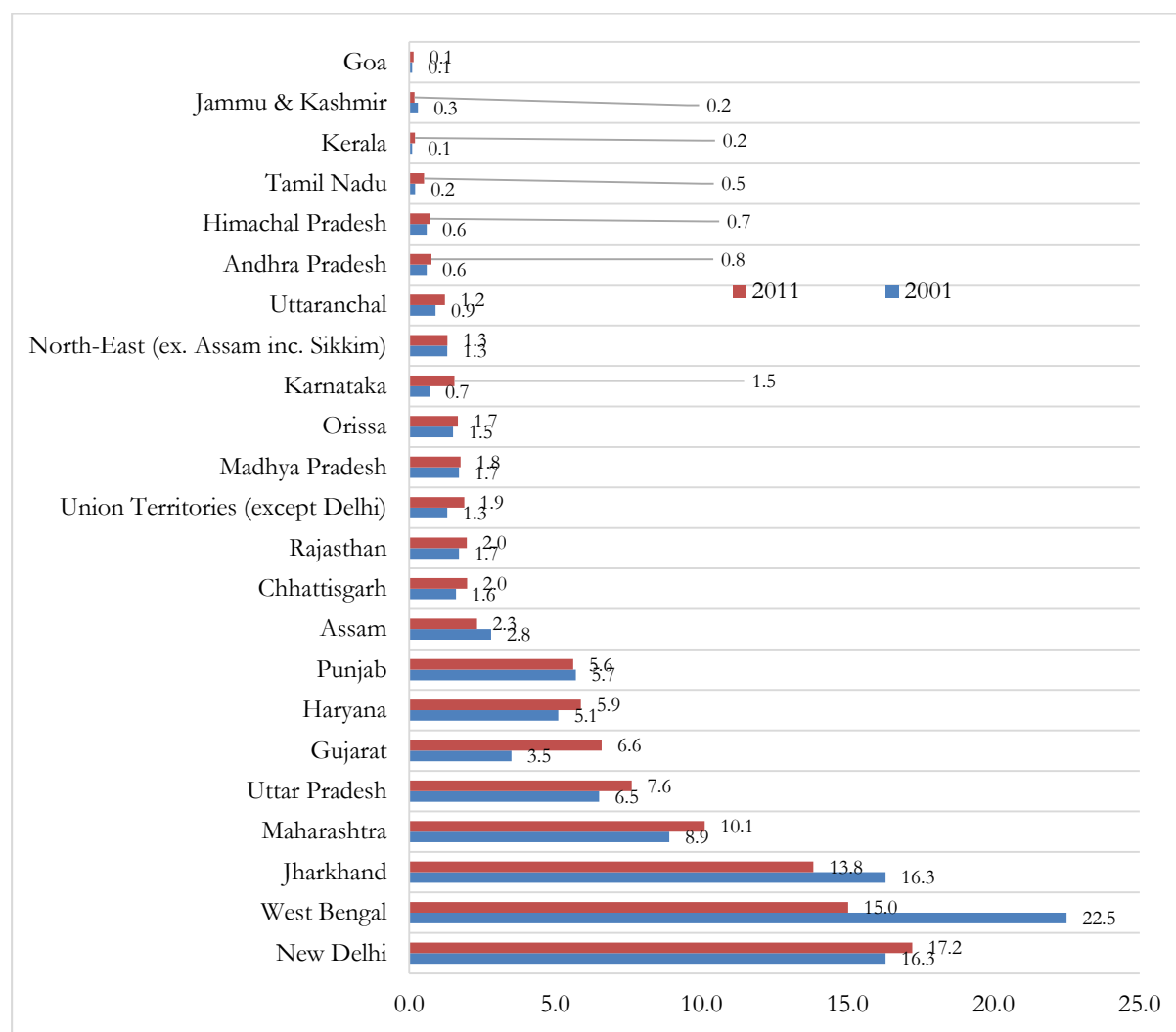
Source: Author's estimation using Census, 2001 and 2011, NSSO, 2007-08

The people who were enumerated outside Bihar are being captured in census based on the place of residence in Bihar. As we have seen male migration is the major component of out-migration from Bihar. Therefore, [figure 7.2](#) presents the distribution of male out-migrants in the various states of India in 2001 and 2011 through census enumerations. It shows that the most preferred destination for the migrants are the northern states of India, in which Delhi has the most out-migrants from Bihar followed by West Bengal and Jharkhand in 2011. Compared to 2001 census, the proportion of migrants has drastically declined in the West Bengal and Jharkhand, while an increase of 0.9 percentage points have been recorded for New Delhi. Subsequently, the out-migrants have increased in 2011 compared to 2001 among the most preferred states in the northern states of India such as - Maharashtra, Uttar Pradesh, Gujarat and Haryana. A significant rise of the migrants in Gujarat have been observed in 2011 compared to 2001. The out-migrants in Gujarat is only 3.5 percent in 2001 which has increased by 3.1 percentage points in 2011. Such increase in the migrants is possibly due to the industrial advancement in Gujarat and demand of labour force in the state.

Proximity of the location and the convenient means of transportation forces migrants to migrate at these states. Jharkhand and West Bengal are the neighbour states of Bihar and therefore it is always convenient to move for the migrants from their place of residence. On the other hand, the convenient transportation and opportunity of works are pull the migrants towards the comparatively developed states such as Maharashtra and New Delhi ([Bhaskaran & Mehta, 2010](#)). The north-west states such as Punjab, and Haryana are mostly dominated by the out-migrants who works in the agricultural fields and most of them are the short term migrants ([Datta, 2016](#); [Das, 2018](#)). However, in inter census decade the migrants have increased in Haryana but it declined by 0.9 percentage points in Punjab. The proportion of migrants are also declining in the north eastern state of Assam, which is considered as one of the most preferred state for Bihar migrants during colonial and post-colonial periods. North-eastern states other than Assam has not recorded any

change in the migrants and only 1.3 percent of migrants were located in the north-eastern states of India. Several reports and research have reported an increase in the preference of the out-migrants to the southern states of India, i.e. Andhra Pradesh, Telangana, Karnataka and Tamil Nadu. However, census 2011 also shows that the incidence of out-migrants has increased from 0.7 percent in 2001 to 3.1 percent in 2011. It means the migrants has almost doubled in the southern states in a decades only.

Figure 7.2 States of out migration of male



Source: Author's estimation using Census 2001 and 2011 survey

In the previous section, we have analysed the reasons of migration (internal migration) and found that marriage is the prime reasons of migration for male and female in rural region. On the other hand, employment found to be essential part of migration among male in urban and marriage remain significant factor for female migration in urban. Table 7.6 presents the reasons of out-migrations of the migrants to other states of India. It shows that in case of out-migration to the

other states of India, male migration is prominent from the rural region and employment is the main motive of migration, while migration of earning members/ parents is found to be the prime reason of migration among females in rural region of Bihar. More than 90 percent of male migrants were migrated for the employment related activities, while 65.48 percent female migrants migrated due to the migration of parents/ earning members followed by 27.07 percent migration due to the marriage. The reasons of out-migration in the urban region also has similar pattern for the male, while marriage is reported to be highest factor of migration among the urban female. Marriage accounted for 45.76 percent female migration followed by 27.86 percent and 24.86 percent for studies and migration of earning member/parents respectively. In comparison to the reasons of migration for internal and out-migration, employment found to be the only reason for male in both types of migration. However, the proportion of employment related migration is much higher for out-migration compared to the internal migration.

Table 7.6 Reasons of out-migrations to other state

Sector / Sex	Reasons of Out- Migration					
	Employment related	Studies	External cause	Marriage	Migration of Parents/Earnings	Others
Rural						
Male	92.94	0.96	0.23	0.00	4.03	1.83
Female	5.04	1.73	0.00	27.07	65.48	0.68
M + F	82.38	1.05	0.2	3.26	11.41	1.69
Urban						
Male	84.81	11.48	0.00	0.03	2.46	1.22
Female	0.88	27.86	0.00	45.76	24.86	0.63
M + F	64.66	15.41	0.00	11.02	7.84	1.08
Rural + Urban						
Male	92.54	1.48	0.22	0.01	3.95	1.8
Female	4.59	4.53	0.00	29.08	61.12	0.67
M + F	81.37	1.87	0.19	3.70	11.21	1.66

Sources: Author's estimation from NSSO migration survey, 2007

Table 7.7 Social-group wise reasons of male out-migration to other state

Reasons of migration	Rural				Urban			
	ST/SC	OBC	Others	Total	ST/SC	OBC	Others	Total
Employment related	96.8	92.6	89.86	92.94	86.72	91.14	70.36	82.88
Studies	0.13	0.65	3.05	0.96	12.95	4.19	20.95	11.25

External cause	0.00	0.34	0.07	0.23	-	-	-	-
Marriage	0.00	0.01	0.00	0.00	0.32	0.54	0.00	0.32
Migration of Parents/								
Earning members	2.02	4.69	3.85	4.03	0.00	1.26	0.07	0.71
Others	1.05	1.71	3.18	1.83	0.00	1.89	3.38	2.31

Sources: Author's estimation from NSSO migration survey, 2007

As we have discussed, the socio-economic (caste and class) condition of the migrants also determine the nature of migration and streams of migration. In case of internal migration, 'other' category migrants migrate to urban region mostly for the employment related activates. On the other hand, the patterns of out-migration among social category of migrants has reverse order. Employment remains be the prime reasons of migration among all categories of migrants in the rural region. However, studies found to be the most important reasons of migration among all categories apart from employment in urban region. [Table 7.7](#) presents the social-group wise reasons of migration in rural and urban regions. It shows that 96.8 percent of ST/SC migrants were migrated for employment related activities compared to the 89.86 percent migrants of 'other' category. The similar pattern is observed for the urban region. The pattern illustrates that the most vulnerable section of the society migrates higher than the socially affluent to the other states for employment. On the other side, 20.95 percent migrates of 'other' category migrates to other states for studies purpose compared to only 12.95 percent and 4.19 percent migrants of ST/SC and OBC categories respectively. The similar patterns is observed in rural region, where 3.05 percent 'other' categories migrants move for study in comparisons to only 0.12 and 0.65 percent migrants of ST/SC and OBC categories.

7.4 Remittances: A Source of Livelihood

Remittances is one of the important part of migration and plays a vital role in raising the household income and standard of living of a migrant household ([Datta, 2016](#); [Xing, 2010](#); [Parida, 2015](#); [Chandrasekhar et al, 2015](#); [Sikdera, 2013](#)). [Table 7.8](#) presents the amount of average remittances sent by out-migrants at the origin. The remittance flow are divided into two parts – remittances sent by out-migrants e migrated within India (including the same state) and the remittances sent by the migrants out-side India. It is evident from table that the amount of remittances sent from abroad is much higher than the remittances sent from India. The large gap in the remittances between India and abroad is due to higher wages and higher monetary value of rupee in other countries. Secondly, as we have discussed, the out-migration for employment are basically male dominated and therefore, the amount of remittance sent by male is quit higher than the female.

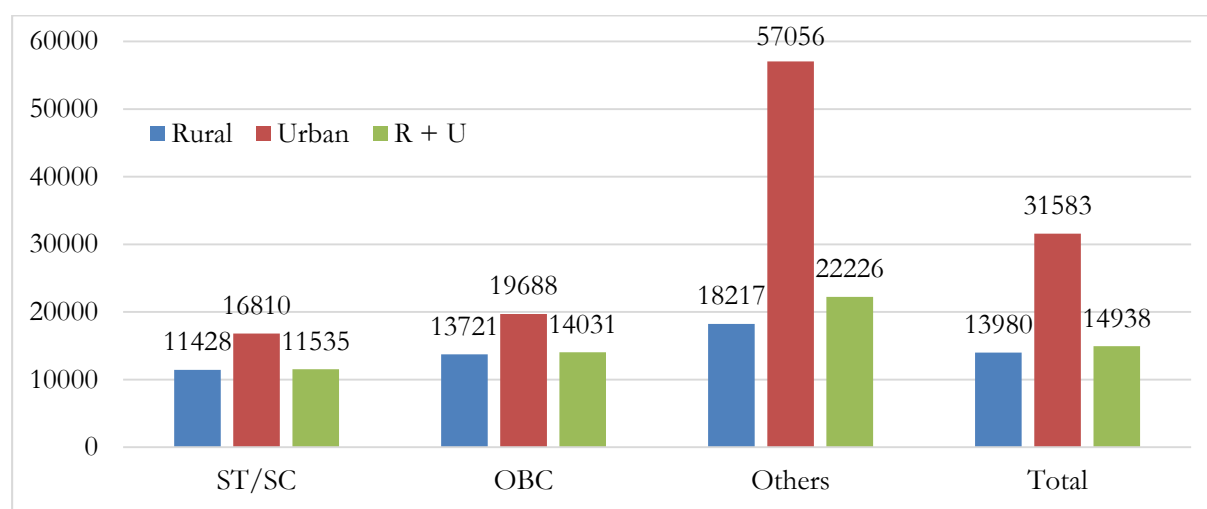
Another reason of low remittance are possibly due to the less remunerative jobs for the female out-migrants. Mostly, the female migrants accompanies her husbands in the jobs done by their husbands at the worksite and share a little wages. On the other hand, the migrants belongs to the urban region are supposed to send higher remittance compared to the migrants of rural region. As it is evident, the difference between the remittances sent by the urban migrants is higher by about ₹ 8000, while the urban male sent ₹9400 higher remittances compared to the rural male. The migrants of urban region are characterised as highly qualified and generally possess high paid jobs compared to the low paid jobs of the rural migrants.

Table 7.8 Average remittances sent by out migrants

Sector	Sex	India(₹)	Abroad(₹)	Overall(₹)
Rural	Male	12400	34200	13000
	Female	2400	000	2400
	Male + Female	12100	34200	12600
Urban	Male	21800	446300	30600
	Female	2300	1200	2300
	Male + Female	20000	392000	27900
Rural + Urban	Male	12900	51300	13900
	Female	2400	1200	2400
	Male + Female	12500	51000	13500

Sources: Author's estimation from NSSO migration survey, 2007

Figure 7.3 Social-groups wise remittances



Sources: Author's estimation from NSSO migration survey, 2007

Moreover, the amount of remittance also vary widely based upon the social status of the migrants. The bar graph in [Figure 7.3](#) shows the remittances received by the out-migrants households belonging to several social groups in rural and urban regions. It is explicit from the figure that the urban migrant households received ₹31583 as a remittances which is 2.26 times higher than the remittances received by the rural migrant households. A social category wise analysis of remittance revealed that the urban migrant households of 'other' categories remitted the highest amount to their households compared to ST/SC and OBC households. In addition, the rural migrants of 'other' categories also remit higher remittances comparatively to their counterparts. The migrant households of ST/SC received the least amount of remittances of both rural and urban regions comparative to the OBC and 'Other' categories. As we can see that, on an average a rural 'other' category migrants remit ₹4496 more remittance than OBC and ₹ 6789 more than the ST/SC migrant households. In contrast, a wide differences were observed between urban migrants of several social backgrounds, as it is evident that migrant households of 'other' category has remitted ₹ 37368 higher remittances than urban OBC migrant households and ₹ 40246 higher than the urban ST/SC migrant households. Overall, 'other' category migrant household received ₹ 22226 compared to ₹ 11535 and ₹ 14031 for ST/SC and OBC migrant household.

7.5 Are the Migrant Households Well-off?

The main purpose of the migration is to raise the household income through remittances and diversification of income. As we have discussed, lack of employment is one of the prime reasons of migration among the male out-migrants. On the other hand, people migrates because of the demonstration effect created around them. Here the demonstration effects mean that if a person observes that the household income and living standard has increased in the nearby areas or in his/her surroundings, it would also induce them to migrate and raise his/her standard of living. Basically, it is supposed that migration will bring remittance and the household income would increase. However, it is always not happening. Some scholars have also found the negative impact of migration on the household income ([Chandrasekhar et al., 2015](#)), while for most of the studies, remittances found to be the major source of earning and a livelihood strategy of the households ([Datta & Mishra, 2016](#); [Parida, 2015](#); [Xing, 2010](#)). Therefore, in case of Bihar, the bar graph in figure 7.4 presents region-wise and social-group wise patterns of household income of the migrant and non-migrant households. Here, the out-migrant households are those households from which any member out-migrated due to the employment related activities and send remittances. It shows that migrant households are fairly well-off than the non-migrant households, whereas the difference in the Household Monthly Consumption Expenditure (HMCE) between migrant and

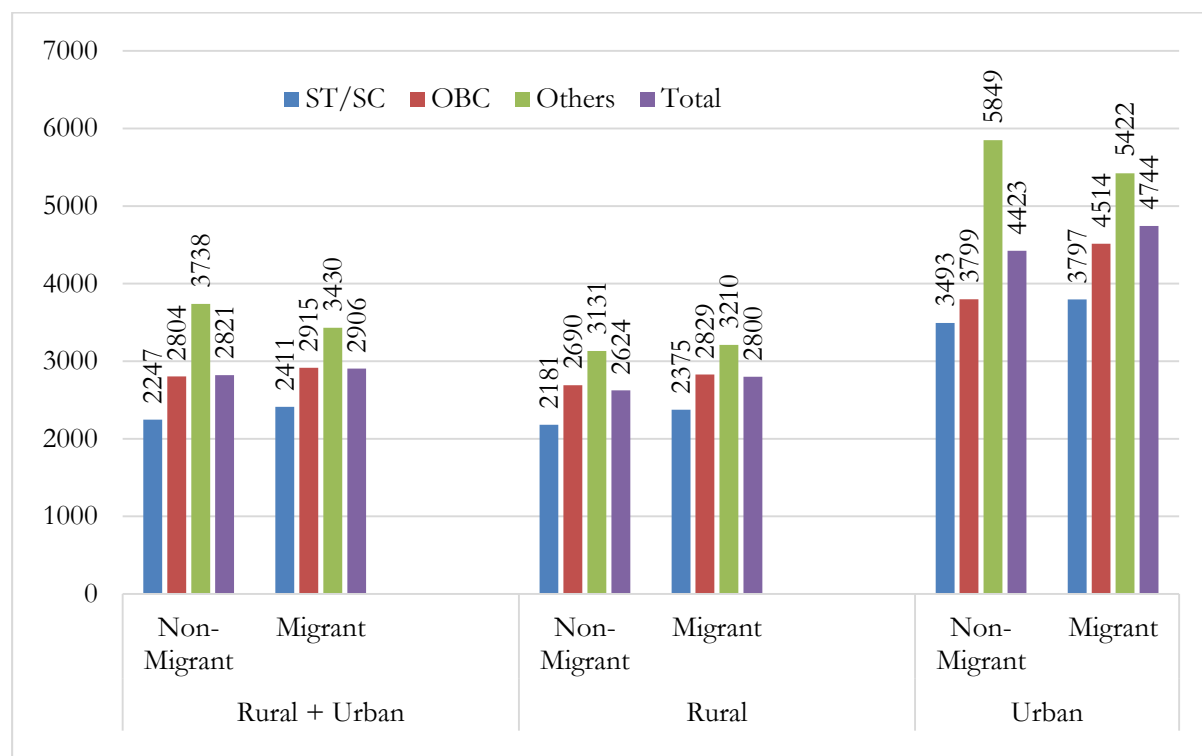
non-migrants were much higher for urban than the rural region. This is probably due to the higher remittances received by the urban households compared to the rural households. Overall, the migrant household has 3.01 percent higher HMCE than the non-migrant households. A region wise analysis shows that the urban migrant households have 7.25 percent higher HMCE than the urban non-migrant households. On the other hand, rural migrant household has only 6.71 percent higher HMCE compared to the non-migrant households. Such non-significance of rural remittances need explanation. There could be data issues, as debt-repayments are not covered often in data, for which migration happens. Also savings and reinvestment can happen alternatively.

The patterns of household monthly consumption expenditure (HMCE) is found to be have similarity with the patterns of remittance received by the migrants of various social groups except for 'other' category migrants. The figure 7.4 also presented the differences in the HMCE for migrant and non-migrant households of various social groups. It revealed that the ST/SC migrant household has 7.28 percent higher HMCE than the non-migrant households. The difference in HMCE between migrant and non-migrant households for OBC were only 3.98 percent which is also lower than the ST/SC categories. On the other hand, for the 'other' category, non-migrant households has higher HMCE than the migrant households. It means that in case of 'other' category households the remittances does not play any important role in raising the standard of living or we can say that the share of remittances is too low to reflect in the their consumption expenditure.

Further, region wise analysis revealed that the higher HMCE in the non-migrant household among the 'other' category is due to the higher HMCE in the non-migrant households in the urban region, while migrant households has 2.52 percent higher HMCE than the non-migrant in rural region. This reflects a wide differences of the role of remittances for the rural and urban households. In case of OBC categories households, the urban migrant households has 18.82 percent higher HMCE compared to non-migrant, while it is only 5.16 percent in rural region. Remittance found to be the most beneficial for the most vulnerable section of the society i.e. ST/SC, where we found that ST/SC migrant households has 8.91 percent higher HMCE in rural region compared to non-migrant households. Similarly, remittance also found prominent for urban migrant households where the migrant households has 8.70 percent higher HMCE than its counterpart. It should be noted that, the highest migration for employment is recorded for the ST/SC households and also the remittance has a larger effect on improving the household's economic condition compared to other social group households. This is due the distress migration of ST/SC households and most part of the remittances are utilised on the food and household

consumptions. Therefore the analysis indicates an unequal role of remittances across the socio-economic class/category of the society and similarly, there are various triggers and repercussion of migration in the society.

Figure 7.4 Sector and social-group wise HMCE for migrant and non-migrant households



Sources: Author's estimation from NSSO migration survey, 2007

As of now, we have discussed the nature of migration and the importance of remittances for a migrant household across various socio-economic characteristics. The present section deals with an empirical investigation while analysing the role of migration and remittance household in the measuring the monthly consumption expenditure taking into account the various socio-economic characteristics of a household. To do so, we have used quantile regression analysis along with ordinary least square (OLS) method to understand the impact of migration and remittances across various quantile class of households. Comparatively, the technique of quantile regression is more appropriate and robust (Koenker & Bassett, 1978). The specification of OLS and quantile regressions and the variables utilised have been discussed in data and methodology sections. Therefore, the empirical results using both OLS and the quantile regression are presented in table 7.9 and table 7.10. The regression specifications in both the tables, household monthly consumption expenditure has been taken as dependent variable and it has been transformed into log form to avoid the problem of non-normality and biasness. The reference categories for the categorical variables such as socio-economic characteristics of households are indicated within the

table. Therefore, the inferences are drawn, henceforth, for the categorical variables will be done with respect of the reference categories only apart from specified separately. Table 7.9 estimated the desired model taking region into account, while table 7.10 presents the empirical results separately for rural and urban regions taking other socio-economic variables as it is in original model.

Table 7.9 Quantile regression using HMCE at household level

VARIABLES	(OLS)†	Quantile Regression					OLS	
		Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)	[95% Conf. Interval]	
Migration (0 Member) @								
1	0.038** (0.015)	0.082***# (0.023)	0.027* (0.017)	0.024 (0.016)	0.038* (0.023)	0.017 (0.018)	0.008	0.068
2 – 4	0.129*** (0.019)	0.191***# (0.028)	0.133*** (0.026)	0.099*** (0.018)	0.073***# (0.019)	0.134*** (0.051)	0.090	0.167
> 4	0.119** (0.047)	0.241***# (0.032)	0.084 (0.060)	0.072 (0.067)	0.017# (0.041)	0.113** (0.044)	0.026	0.211
Region (Rural)								
Urban	0.353*** (0.025)	0.234***# (0.038)	0.252***# (0.026)	0.280***# (0.022)	0.411***# (0.054)	0.578***# (0.045)	0.304	0.403
Social Group (ST/SC)								
OBC	0.097*** (0.014)	0.097*** (0.021)	0.097*** (0.017)	0.076*** (0.016)	0.087*** (0.018)	0.079*** (0.017)	0.069	0.126
Others	0.202*** (0.022)	0.093**# (0.040)	0.174*** (0.024)	0.200*** (0.023)	0.210*** (0.027)	0.169*** (0.026)	0.159	0.246
Household Types (Self-Employed)								
Regular Wage	0.184*** (0.063)	0.017# (0.192)	0.150*** (0.033)	0.281*** (0.087)	0.368***# (0.110)	0.375**# (0.152)	0.060	0.308
Casual Labours	-0.181*** (0.013)	-0.238***# (0.022)	-0.195*** (0.019)	-0.146***# (0.015)	-0.145***# (0.018)	-0.181*** (0.018)	-0.207	-0.154
Others	-0.114*** (0.025)	-0.304***# (0.047)	-0.169***# (0.032)	-0.098*** (0.027)	-0.036# (0.036)	0.029# (0.042)	-0.164	-0.064
Religion (Hindu)								
Others	-0.065*** (0.016)	-0.027# (0.031)	-0.060*** (0.021)	-0.057*** (0.016)	-0.053** (0.022)	-0.060** (0.023)	-0.097	-0.034
Land Holdings (0 – 1 Acres)								
1 – 2.5 Acres	0.062*** (0.015)	0.077** (0.031)	0.079*** (0.020)	0.069*** (0.016)	0.054** (0.022)	0.007# (0.020)	0.031	0.092
2.5 – 10 Acres	0.196*** (0.020)	0.173*** (0.030)	0.206*** (0.023)	0.212*** (0.019)	0.196*** (0.025)	0.170*** (0.035)	0.157	0.235
> 10 Acres	0.373*** (0.085)	0.412*** (0.067)	0.307* (0.179)	0.337*** (0.100)	0.342*** (0.064)	0.595***# (0.072)	0.206	0.540
Household Size (1 -4)								
5 -7	0.424*** (0.012)	0.589***# (0.022)	0.470***# (0.016)	0.396*** (0.014)	0.321***# (0.016)	0.278***# (0.014)	0.401	0.448
> 7	0.742***	0.890***#	0.765***	0.712***	0.667***#	0.670***#	0.709	0.776

Constant	(0.017) 7.459*** (0.018)	(0.028) 6.958***# (0.029)	(0.022) 7.235***# (0.022)	(0.017) 7.487*** (0.020)	(0.022) 7.738***# (0.022)	(0.022) 7.977***# (0.023)	7.424	7.494
Observations	8,764	8,764	8,764	8,764	8,764	8,764	8,764	8,764
R-squared	0.464							

*Source: Author's computation from the NSSO 64th round Survey 2007-08. Note: Standard errors in parentheses; Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 # denotes that the coefficients are not statistically and significantly different than OLS. † The Breusch-Pagan test is $\chi^2(1) =$ with p=0.000 and confirms the presence of heteroskedasticity. While the Shapiro-Wilk test is for z with p=0.000, it indicates that the distribution of residuals is not normal. @ Reference Category, SC/ST= Scheduled Caste/ Scheduled Tribe, OBC= Other Backward Caste*

Table 7.10 Quantile regression using Rural HMCE at household level

VARIABLES	(OLS)†	Quantile Regression					OLS	
		Q(0.1)	Q(0.25)	Q(0.5)	Q(0.75)	Q(0.9)	[95% Conf. Interval]	
Rural								
Migration (0 Member) @								
1	0.048*** (0.016)	0.093***# (0.024)	0.048** (0.019)	0.035** (0.017)	0.041* (0.022)	0.011# (0.018)	0.017	0.080
2 – 4	0.127*** (0.020)	0.193***# (0.028)	0.127*** (0.025)	0.094*** (0.024)	0.078***# (0.022)	0.124*** (0.047)	0.087	0.167
> 4	0.126*** (0.047)	0.246***# (0.025)	0.107*** (0.037)	0.075 (0.077)	0.023# (0.031)	0.126* (0.076)	0.034	0.218
Urban								
Migration (0 Member) @								
1	0.031 (0.057)	0.062 (0.080)	0.059 (0.086)	-0.066 (0.050)	0.026 (0.035)	0.029 (0.111)	-0.080	0.143
2 – 4	0.165*** (0.062)	0.245 (0.245)	0.293***# (0.081)	0.079 (0.104)	0.131 (0.213)	0.232 (0.265)	0.042	0.288
> 4	0.027 (0.215)	-0.502***# (0.150)	0.198** (0.082)	0.110 (0.089)	0.201*** (0.062)	0.352 (0.629)	-0.396	0.449

Source: Author's computation from the NSSO 64th round Survey 2007-08. Note: Standard errors in parentheses; Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 # denotes that the coefficients are not statistically and significantly different than OLS. † The Breusch-Pagan test is $\chi^2(1) =$ with p=0.000 and confirms the presence of heteroskedasticity. While the Shapiro-Wilk test is for z with p=0.000, it indicates that the distribution of residuals is not normal. @ Reference Category

The variable migration represents the migrant and non-migrant households such as 0 member represents a households having no out-migrants and so called non-migrant households. On the other hand, migration with 1, 2-4 and >4 represent households with different number of migrants. Our proposition is that a migrant household has higher consumption level and also the higher the number of migrant members higher would be remittance and so higher would be consumption level. Hence, the OLS and quantile regressions presented in table 7.9 shows that there is a significant increase in the consumption of the migrant households compared to the non-migrant households and also as the number of migrant member increased in the households, the consumption increases too. OLS regression suggests that household has one migrant member, there HMCE increased by 3.8 percent and the percentage increased to 12.9 if there were 2 – 4 migrant member in the household. However, consumption level increased by only 11.9 percent with a further increase in migrant member. However, the quantile regression at five different quantile shows only significant different consumption for migrant households with 2 -4 migrant members except for 10th quantile. The regression at the 10th quantile shows a significant continuous increase in consumption for a migrant households with an increase in the migrant member. Additionally, the coefficients at 10th quantile were significantly different than the OLS estimates. It means that at the lowest consumption quantile, higher the migrant member would result higher consumption level.

Moreover, most of the poor households are dependent on the remittances and a large part of the remittance are usually utilized on the food consumption and expenditures. That's why remittances plays an important role in raising the living standard of the most vulnerable section of the society, as it confirmed through the results. As we move on to the higher consumption quantiles of the households, migration of only one member did not significantly affect the HMCE, while as the number of migrant member increase between 2 and 4, it has significant positive impact of the consumption level. As we have seen that the urban HMCE is found to be exorbitant compared to rural consumption expenditure. The same can be confirmed through the regression analysis as it shows that there is a highly significant differences in the HMCE between rural and urban regions. The urban HMCE is higher by 35.3 percentage compared to rural region, while the quantile regression shows that the urban consumption increased further with an increase in the consumption quantiles. Additionally, the quantile coefficient is statistically significantly different from the OLS estimates at all of the quantile classes. Therefore, table 7.10 presents a separate analysis for rural and urban regions to understand the relationship between migrant and non-migrant households. The table explicitly shows difference in the consumption level across regions due to the migration. The OLS regression

shows that there is a significantly higher consumption in the migrant households compared to non-migrant in the rural region, while it is only significant for a household have 2 -4 migrant members in the urban region. As it is evident, the consumption increase by 4.8 percent for a household with one migrant member and it increased to 12.7 percent and 12.6 percent for 2 -4 and greater than 4 migrant members.

On the other hand, consumption level is only significant and increased by 16.5 percent for the migrant households have 2 -4 migrant members. Meanwhile, the quantile regression indicates a significant differences in the consumption level across the quantile classes in rural region and its coefficient were significantly different than OLS at 10th quantile and 75th quantile. At the lowest consumption quantile the consumption level increased with an increase in the number of migrant members – the consumption level increased by 9.3 percent, 19.3 percent and 24.6 percent for 1 , 2 -4 and >4 migrant member households respectively in the rural region. As the consumption quantile increases, the effect of migration on the HMCE declined, while at the top quantiles there is not any significant impact of 1 member migration on consumption at 5 percent level of significance. Further, the similar pattern is recorded if migrant member increased from number four. On the other hand, we hardly found any significant relationship between migration and consumption level across quantile classes in the urban region. The OLS estimates shows that the consumption level significantly increased by 16.5 percent only for the households have 2 – 4 migrant members, while at the first quantile it has no any significant relation between migration and HMCE. Instead of this, the consumption level significantly declined by 50.2 percent at the lowest quantile if number of migrant increased more than four. We found a significant difference than OLS estimate and 29.3 percent higher consumption level at the 25th quantile for the households have 2 – 4 migrant members in the urban region.

Considering various socio-economic indicators of households upon controlling for migrant and non-migrant households, the regression shows that the households of OBC and ‘other’ category has significantly higher HMCE compared to ST/SC, while the same pattern is found at several consumption quantile classes except the lowest 10th quantile. At the 10th quantile the households of ‘other’ category has significantly higher consumption than the SC/ST but is lower than the OBC. Further, the coefficient for ‘other’ at 10th quantile is only significantly different than the OLS estimates. Regular wage earner household has significantly higher HMCE compared to self-employed households and it is significantly lower for casual labour and ‘other’ household types. The consumption level is found to be significantly different largely at the lowest and highest consumption

quantiles. Taking into account the religion of the household, the Hindu household has higher HMCE than the non-Hindu and it is significantly higher at the lowest quantile. Land holding too has a significant role in consumption level, as the result shows as the land holding increase the consumption level increases significantly. However, the consumption level differ significantly only for the upper consumption quantile and it also increased with an increase in the land holdings. Lastly, the household size has the positive impact on the consumption level – as the number of households increased the level of consumption increased significantly, while considering at various consumption quantiles, it shows that the consumption level significantly differed for the lowest and the highest consumption quantiles – 10th -25th and 75th -90th quantile respectively.

7.6 Conclusion

Bihar has a long history of migration from ancient to colonial period and in current periods. The migration rate is increasing year on year and remittances has become an essential part of livelihood in Bihar. However, Migration has many dynamics known as streams of migration such as – rural to rural, rural to urban, urban to urban and urban to rural. Employment related activities and marriage are the prime reasons of migration among male and female respectively. Migration from rural to urban for employment related activities mainly constitute male migration and sending remittances to their households are the prime objectives of the migrants. Upon analysing the migration dynamics in Bihar we found that migration rate has increased in last decades where the incidence of rural to urban migration is higher than the other migration streams. Employment related activities and marriage are the prime motives of migration for male and female respectively. Employment are the prime factor of male Out-migration to other states of India and northern states of India accommodate most of the out-migrants.

However, census shows that the out-migration in the southern states of India has increased considerable in the past decades. The most vulnerable section of the society i.e. ST/SC of the rural region has the higher incidence of out-migration for employment related activities. The amount of remittances also varied across the social group, region and gender of the migrants. The SC/ST remit much lower than the OBC and ‘other’ social groups probably due to the engagement of the low level of employment at the destinations. On the other hand, the empirical estimation revealed that the remittance has not benefitted equally to the households. The lower consumption quantile of the households were the most benefitted of remittance compared to the higher classes of migrants. However, migration remittances can still increase savings of the households and investments in social

and other factors. Investing in childrens education, meeting health expenditures etc could be helped by the remittances, which is often not captured by survey data.

Coming to role of migration in growth and structural transformation of Bihar, we need to state some things. We have seen that about 20 percent of male migrants are migrating from Bihar. The push and pull factors both could be the reasons. Bihar's labour are migrating to construction, manufacturing, mining, hotels and transport, besides educated people migration to service sector. The migration has increased in magnitude in the recent decades, even though migration is prominent in Bihar for a very long time. The remittances have explicitly marginally pushed the consumption expenditures of households, more prominently for Dalits. Remittances can have an effect in escaping penury and starvation. They can increase social expenditures, which are crucial for structural transformation. We do feel, as the data suggest, migration and its remittances play an important role in the growth story of Bihar and its structural change.

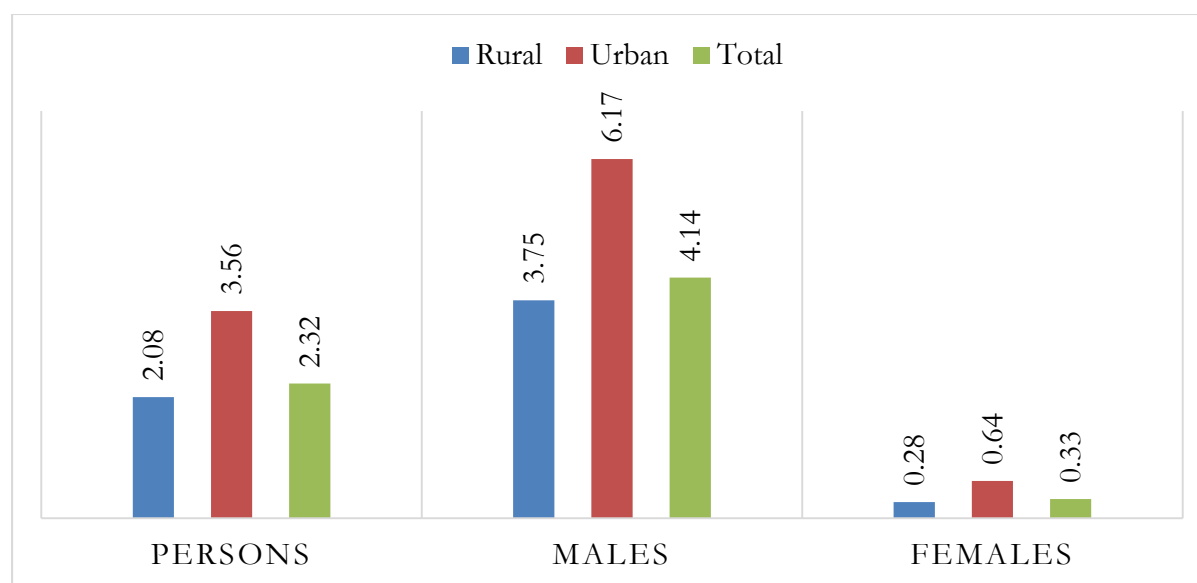
Appendix

Table A7.1 Migration rate among social groups

Social Group	Male + Female			Male			Female		
	Rural	Urban	R + U	Rural	Urban	R + U	Rural	Urban	R + U
ST/SC	19.00	23.69	19.23	1.14	10.05	1.62	37.50	40.37	37.63
OBC	18.49	30.32	19.58	1.19	16.32	2.63	37.28	46.37	38.1
OTHERS	20.23	47.02	24.97	1.09	34.99	6.9	41.11	59.14	44.41
Total	18.86	34.49	20.37	1.17	20.82	3.1	37.89	49.67	39.01

Sources: Author's estimation from NSSO migration survey, 2007

Figure A7.1 Percentage of out-migrants for employment purpose



Sources: Author's estimation from NSSO migration survey, 2007

Table A7.2 Social-group wise reasons of male out-migration

Reasons of migration	Rural				Urban			
	ST/SC	OBC	Others	Total	ST/SC	OBC	Others	Total
Employment related	93.31	88.96	83.65	88.84	86.72	91.14	70.36	82.88
Studies	1.3	1.99	5.44	2.48	12.95	4.19	20.95	11.25
External cause	0.82	0.3	0.17	0.38	0.32	0.54	0	0.32
Marriage	0.44	0.88	0	0.64	0	1.26	0.07	0.71
Migration of Parents/ Earning members	2.82	6.16	8.11	5.88	0	1.89	3.38	2.31
Others	1.32	1.7	2.63	1.79	0	0.99	5.25	2.53

Sources: Author's estimation from NSSO migration survey, 2007

Chapter 8

Summary and Conclusion

8.1 Introduction

Bihar is the poorest state in India, for a very long time and is so even in the present. There are historical reasons for its backwardness. Bihar, as a part of Calcutta Presidency had a greater part under *zamindaries*, which became bastions of feudal and semi-feudal relations of production. The colonial tax systems had compelled commercialization of agricultural production, forcing farmers to produce opium, indigo, and other cash crops. Such forms of commercialization ended up making farmers caught in the vortex of moneylenders, volatile global markets and ruined them from multiple exploitative means. Caste hierarchies are used as graded means for enforcing unpaid labour. Thus real producers were denied of any possibility of accumulation.

The post-Independent period ushered in some reforms such as Abolition of Intermediaries, abolishing Zamindari. While it was mostly successful in most states of India, Bihar remained an exception in a failure of them, thus retaining strong semi-feudal relations in Bihar. The introduction of modern medicine and improvement of foodgrain production in the country led to population explosion, by reducing crude death rates. Bihar became baby-boomer in sixties and seventies, bloating its population. Thirdly, Bihar's rich mineral resources in coal did not benefit the state due to the so called 'freight-equalization' which made coal as costly for Bihar as it is in any other state. Finally, successive political regimes for a long time did not show the required statesmanship to change the course of economy. However, the political struggles fought in bitter way and the progressively increased degree of democracy, have led to ending of political monopoly of some old parties and created competitive pressures of performance towards beginning the new millennium.

We thus argue that the economic growth began showing little more momentum since 1993-94 onwards and accelerated towards 2005-06 before began slowing down towards 2014-15. Such an accelerated growth is accompanied by a structural change, which makes the nature of growth more credible and sustainable.

Labour and capital are two most important factors of production and to trace the process of economy growth in the economy. Therefore, changes in the income and employment structure in the

labour market are the main point of analysis in this study. For income structure, gross state domestic product of Bihar has been taken, on another hand, activity status of an individual, employment and migration patterns have been considered to analyse the labour market structure. Historically, Bihar is among the poorest states of India since independence. The backward agrarian system, stringent socio-economic and political structure has been a catalyst in the Bihar's backwardness. However, Bihar has experienced a significant and sustained growth rate in the late 2010s compared to the earlier periods and hence, has improved its position at some level of development. Even though, the perceived higher economic growth was showed up the shorter period and it was not enough or also did not sustained after 2011-12. Meanwhile, the historical backwardness of Bihar begs several research questions and compel to investigate that why its growth has not paralleled with other states? Why is the Structural change in the economy so slow? Why did the economy remain backward? What are the historical, institutional or political reasons for its Backwardness? What are the political economy of conflicting forces and interests? What are the determinants of the backwardness and the way out? How are the various socio-economic factor interlinked in the growth process? Has the nature of occupation been diversified and how it generating impulse in the economic growth? What are the productive sectors for employment generation? How has the migration and remittances benefiting to the migrant households? These are some of the questions that have been looked upon in the thesis. Therefore, this study has been important while engaging with the understanding of the process of structural changes taking into account the various socio-economic factors. In additions, we have taken comparatively a longer period into our analysis which is around more than two and a half decade (1993-2018), this also adds-value in the thesis.

Based on the research questions we have major five objectives of the study: to analyse the employment dynamics in the labour market and the determinants over the period of 1993-94 to 2017-18 in Bihar; to understand the trends in economic growth and to explore the sources of economic growth and structural change in income at the sectoral level; to analyse the dynamics of the employment status and occupational structure and productivity in the labour; and finally to analyse the role of migration and remittances on the well-being of the households in Bihar.

We have tested some hypothesis in the thesis, such as: (i) Bihar has witnessed construction-led growth in the growth phase ; (ii) socio-economic factors (like gender, age, social-group, religion, income, etc.) have a significant impact in determining the activity status of an individual; (iii) decline in female labour force participation has significant role in the decline in overall worker participation

rate in Bihar; (iv) changes in the occupational structure has raised the labour productivity and economic growth in Bihar; (v) endogenous factors of like technological growth and capital accumulation/ formation are the major drivers of labour productivity and economic growth in Bihar; and (vi) there is a positive relationship between remittances and standard of living of the households in Bihar.

Based on the objectives, the study is divided into mainly six parts – firstly, the determinants and the changes in the activity status of an individual (taking into account the population) from economic to non-economic activities have been analysed. Secondly, we were concerned about the determinants and the changes in the employment pattern in labour market (taking industrial and occupational classifications). Thirdly, the determinants of changes in the income structure were analysed, while the next analysis deals took employment and income together to understand the role of capital and labour in productivity growth, lastly, role of migration and remittances have been analysed to explain the economic growth and labour market conditions. In India, National sample survey and Census provides the most comprehensive and reliable source of labour market statistics based national-wide survey. Therefore, the employment, employment survey data and periodic labour force survey data have been utilised along with other macro-economic data based on the database on Indian economy, Reserve Bank of India and other government sources. The next section explains briefly the major findings of the chapter discussed in the thesis with an overall remarks at the end.

The study used only secondary data sources, specifically, various macro-economic data from the database on the Indian economy, Reserve bank of India, Directorate of economics and statistics, government of Bihar, yearly reports on economic survey published by government of India as well Bihar, Database of NITI Aayog and data.gov.in. In addition, the major chapters of the thesis used unit level household survey data on the labour force and migration survey conducted by National Sample Survey, Ministry of Statistics and programme implementations, Government of India. The thesis used basis statistical tools and econometrics models to substantiate the objectives of the thesis along with the cross-tabulations, graphs and figures using MS excel, E-views and STATA software.

8.2 Summary of the Major Findings

This thesis is divided into eight chapters apart from the *introduction* chapter. Out of eight chapters, six prime chapters are to meet the various aforesaid objectives of the study – chapter 2 to chapter 7. Each

objectives was dealt separately in each chapters. A summary of the major findings of the the chapters are presented below.

This Bihar had been a historically backward region, and the historical specific factors such as Zamindari settlements, forced commercialisation, and failure to implement Zamindari Abolition has posed serious political economy impediments to the accumulation process in Bihar. A good amount of literature survey on this lends credence to the view about the built in depressors in Bihar's agrarian economy. Added to that an unfair freight equalisation policy that led a comparative disadvantage for industrial sectors in Bihar, negligence of central as well as state institutions during both pre and post-independence India, low credit to debt ratio, and socio-political conflicts and caste and class struggles come forth as factors for slow growth in Bihar. Further, Bihar had failed to channelise the benefit of liberalisation policies since 1991, like other states. A significant political shift in 1990s began inspiring economic growth in Bihar which is witnessing a restructuring of the caste and class composition of the society too. Another political turnaround was witnessed in 2005 that accelerated the economic growth of Bihar. However, the growth rate was not continued and witnessed on an average lesser growth rate than the previous periods. Boost in the agrarian system and inflow of funds in the market have a positive impact on the economy. These aspects have been covered in Chapter 2.

Chapter 3 titled, 'Economic growth in Bihar: A disaggregated sectoral analysis', presents a detailed analysis of the growth performance in Bihar. This chapter illustrates various growth phases in Bihar over the study periods. Therefore, the main purpose of the study in this chapter is to understand the trends and patterns of the economic growth in Bihar at the sectoral level over the period of 1993-94 to 2017-18. Further, a disaggregated analysis of the gross state domestic product has been done at the sectoral level considering the composition of the various identified sectors in the income to understand the changes in size and structure/shape of the Bihar economy. In addition, we have decomposed the economic growth using sectoral growth rate and share to track the contribution of the sectors in the overall growth in the economy. To meet the objective, we have used sector-wise gross state domestic product of Bihar at 2011-12 constant price. The gross state domestic products data are extracted from economic and political weekly research foundation (EPWRF) and directorate of economics and statistics, Bihar. Several Statistical analyses (Levene's test and t-test) have been performed for trend and comparative analysis, while growth-share analysis has been performed for growth decomposition at the sectoral level.

Based on the growth trend analysis, we found distinctively two-growth regimes in Bihar over the period of 1993-94 to 2017-18. The first growth regime – 1993-94 to 2004-05 was characterised as low and astatic growth; the second growth regime – 2005-06 to 2017-18 has high and static growth. Further, each growth regime has two growth phases. The average growth in the earlier phase was higher than in the later phase in both regimes. The growth differential between the regimes was due to the significantly higher growth of the tertiary sector in the second regime. Such as – tremendous rise in the development expenditure by the government through expansionary fiscal policies. An introduction of agriculture road map has positively impacted the growth in agriculture produces and thus a stagnant and sustained primary sector growth rate. On the other hand, a significant decline was observed in the income share of the primary sector with an increase in both secondary and tertiary sectors. While decomposing the changes in the growth rates between regimes and various phases, we found manufacturing has the highest contribution to growth, followed by the TSC sector between regimes. On the other hand, despite higher growth rate of the manufacturing sector in fourth phase, it has not contributed to the overall growth between third and fourth phases. The empirical estimation implies that capital formation has played a significant important role in the achieving high growth rates initially.

In the labour market, employment growth and its structure determine the well-being of the households. However, in the population structure, all of the population are not always engaged in any economic activity to contribute to the production process and so, it is identified according to the three broad activity status (employed, unemployed, and out of labour force) of an individual in any economic or non-economic activities. Chapter 4 titled, '*Changes in the key indicators of labour market and the demographic structure in Bihar,*' delves into the trends and patterns of employment over the study periods along with the activity status in the non-economic status of an individual. This chapter provides a detailed account of the activity status in the population structure and also answers the factors of the declining labour force in Bihar. Further, the role of the demographic structure and human capital and several socio-economic factors have been analysed in determining the activity status of an individual. We have used five rounds of labour force survey from 1993-94 to 2017-18 to meet the objectives. Three broad activity status are further decomposed into various parts to understand the determinants of changing labour market structure. The marginal effects have been estimated for activity status using pooled multinomial logistic regressions of the five rounds of labour force surveys. The analysis of the decomposing various activity status showed that there is a sharp and significant

decline in the employed status, and rise in the inactivity status of an individual. Moreover, the decline in the employed status is mostly observed due to the withdrawal of the female labour force participation in rural region. The marginal effects from the empirical estimations illustrated a significant impact of the socio-economic factors in determining the activity status of an individual in the labour market of Bihar. A further disaggregated analysis of the activity status revealed that the decline in the female labour force participation is due to the increase of the female workforce in the education and domestic duties apart from a significant decline in the employment from the household categories in the employment status. Further, a significant decline is observed from the activity status of 'free collection of goods'. On the other hand, the empirical estimation revealed a significant decline in the unpaid family labour and younger female of the age groups 15-29 years along with the significant impact of the socio-economic factors. These patterns illustrate a significant improvement in the quality of life of the female workforce where an increase in investment in human capital is commendable in the process of development.

The chapter 5 concentrates only on the employment status of an individual and deals with the changes in the labour force composition across various identified sectors over the study period. Therefore, the main objective of the chapter is to understand the dynamics of the employment status in the labour market and the role of structural change in the economic growth of Bihar over the periods of 1993-94 and 2017-18. The employment status of an individual have been analysed across the industrial and occupational classifications. In this chapter, we have also used the labour force survey data of five rounds since 1993-94, and estimated marginal effects after utilising the multinomial logistic regression for empirical estimation. The analysis shows a significant changes in the employment patterns across the industrial and occupational classifications over the periods.

However, the major changes in the employment structure is observed between 2004-05 and 2017-18. The workforce in the primary sector has declined by 35.53 percentage points, in which about eighty percent of the workforce declined between 2004-05 and 2017-18. The decline of the workforce share in primary sector was absorbed into secondary and tertiary sector in 57:43 ratio. A further disaggregated analysis revealed that the maximum workforce has been absorbed in the construction sector followed by trade and hotel services. Interestingly, the employment share in the service sector has declined for male in the urban region in contrast to a significant rise in rural region. On the other hand, the impact of female employment can be observed as the rise in tertiary sector employment in both regions compared to the decline in primary sector employment. However, gazing over the

workforce participation by occupational classification, it revealed that the decline of the workforce in primary sector is due to withdrawal of casual wage labourers in the sectors rather than the experienced ones. Lastly, the empirical estimation suggests a significant impact of the socio-economic factors in the change in the workforce patterns.

Among the factors of production, labour and capital are the most important determinants in economic growth. Whether changes in the labour market structure and capital accumulation is key to productivity growth. Bihar, witnessed productivity growth mostly due to capital formation initially, which perpetuate the changes in the labour market structure. Therefore, a comprehensive analysis of the impact of capital accumulation and labour movement has been done at the sectoral level in chapter 6 - '*Structural change and labour dynamics: A productivity decomposition approach*'. Amid unavailability of time-series data on the labour force, we have done a productivity decomposition analysis using shift-share analysis to understand the role of structural change in terms of the labour movement and technological/capital accumulation in the economic growth of Bihar. The analysis of the decline in employment elasticity suggests a jobless growth in the Bihar economy. Meanwhile, the employment elasticity was greater than '1' for only two sectors namely –construction and FIRB and also it was higher in 2004-05/2017-18 compared to 1993-94/2004-05. This indicates that the growth in these two sectors were generating enough impulse so that it has created employment.

Moreover, the structural change analysis suggests the movement of the workforce from low to high productive sector with an equal contribution of the technological growth and workforce movement in the overall productivity growth. Considering the productivity decomposition across the four periods, the contribution of the 'within effect' (technological change or capital accumulation) is higher in the growth phase, while the contribution of structural change in the productivity growth was higher than the within-productivity growth low growth phase (2011-12/2017-18 and also in 2004-05/2017-18). The analysis further suggest the role of capital formation in the primary and tertiary sector is higher than the manufacturing sector. Hence, the underperformance of the manufacturing sector in the state is worrisome which need an immediate favourable policy actions.

The seventh chapter focused on the role of migration and remittances in the growth process of Bihar. As we know, Bihar has a very long history of migration from ancient to colonial period and in current periods. The migration rate is increasing year on year and remittances has become an essential part of livelihood in Bihar. However, Migration has many dynamics known as streams of migration such as – rural to rural, rural to urban, urban to urban and urban to rural. Employment

related activities and marriage are the prime reasons of migration among male and female respectively. Migration from rural to urban for employment related activities mainly constitute male migration and sending remittances to their households are the prime objectives of the migrants. Therefore, the main objective of this chapter is to understand and analyse the impact of migration and remittances on the well-being of the households in Bihar across dimensions of region, gender and social groups. We have used census 2001, 2011 enumeration data and NSSO 'employment unemployment and migration' survey 2007-08 data to understand the trend, stream and extent of migration. Further the impact of migration and remittances on the household consumption expenditure have been analysed using NSSO survey data.

Upon analysing the migration dynamics in Bihar we found that migration rate has increased in last decades where the incidence of rural to urban migration was higher than the other migration streams. Employment related activities and marriage is the prime motives of migration for male and female respectively. Employment is the prime factor of male Out-migration to other states of India and northern states of India accommodate most of the out-migrants. However, census showed that the out-migration in the southern states of India has increased considerable in the past decades. The most vulnerable section of the society i.e. ST/SC of the rural region has the higher incidence of out-migration for employment related activities. The amount of remittances also varied across the social group, region and gender of the migrants. The SC/ST remit much lower than the OBC and 'other' social groups probably due to the engagement of the low level of employment at the destinations. On the other hand, the empirical estimation revealed that the remittance has not benefitted equally to the households. The lower consumption quantile of the households is the most benefitted of remittance compared to the higher classes of migrants.

8.3 The Final Remark

The importance of labour and capital in the production process and economic growth are well defined among the growth and development theories. Therefore, this thesis critically examined the role of labour and capital in the economic growth of Bihar through the structural change analysis. The participation of an individual in the economic and non-economic activity determines its role in the labour market. While analysing changes in the population structure taking activity status, we found that a declining worker population rate has emerged a delicate phenomenon in Bihar in contrast to the better economic growth. Such phenomenon suggest a jobless growth in Bihar as employment elasticity found to be less than one. Our findings suggest there could be two reasons for this – firstly,

a significant decline in the female labour force, and secondly, higher prevalence of male out-migration from Bihar in the recent decades. These phenomena could be understood in two ways – firstly, due to the stringent agrarian system and lack of manufacturing development, Bihar has a very long history of migration across India and around the world. The migration has increased manifold in the recent decades due to both pull and push factors. Therefore, most of the male workforce migrate out of Bihar and so not able to capture in the national sample survey.

Secondly, the decline of the female workforce in the recent decade suggests an improved household income, educational attainment and inclination towards household chores (housewifization). Specifically, an increase in the enrolment ratios of the young females (15-29 years age) in the education system led to a decline in young female labour force participation. At the same time, the preference for caregiving at the household instead of working outside has also increased among the married women or female of working age group. During the late 2000s, women were forced to work in agriculture and in their household due to the male-dominated migration and low household income. Meanwhile, remittances received from the migrant male counterpart has a significant role in the improving the household income and raised the standard of living. This implies a negative relation of economic growth and female labour force participation and confirms that Bihar is moving towards the lowest point of the U-curve hypothesis of female labour force participation and economic growth.

Considering the employment structure among the industrial sector and occupational classifications, we found that, more than forty-five percent of the workforce were engaged in the agriculture sector in 2017-18 compared to eighty percent in 1993-94. In contrast, primary sector contributed only one-fifth in the state income compared to the three-fifths income share of the service sector. The decline of the workforce share in the agriculture sector is due to the movement of the unskilled agricultural labourers towards the non-agriculture sectors. Interestingly, percentage of skilled agriculture worker has increased in the last decade, in addition to the capital formation and technological improvement that could have been an important determinants of growth in the agriculture productivity level. A robust agrarian performance has a positive impact on the non-agriculture sectors due to backward and forward linkages among the sectors. It seems to be valid in case of Bihar, where we have witnessed high growth rates of non-agriculture sectors when the primary sector performed better.

An increase in the government expenditure on development projects such as roads, bridges and other infrastructure have been engaged most of labour forces in the construction sector. The capital investment/capital formation by the state have a multiplier effect on other sectors too as we have

witnessed the highest contribution of the financial/real estate, transport/storage and communication sectors in the economic growth of Bihar. However, the decline in average growth after 2011-12 have posed questions of its sustenance in the future. Lastly, the growth model of the Bihar could be understood as the combination of changes in the socio-political structure, value addition by the non-farm sectors, and contribution of the remittances in the rural households.

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Structural change, Employment and Economic growth in Bihar, India: A disaggregated sector-wise analysis

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Abstract

Bihar economy has been growing at a phenomenal rate since the last decade compared to the subdued growth rate in the 90s. Such economic growth leads to structural changes in the economy in the form of reallocation of economic factors within the different sectors of the economy. The increase of output with a reallocation of labour and employment composition is the silent feature of structural changes in the economy, and hence economic growth occurs as a result. Bihar, the most underprivileged state in India, drew attention due to rapid growth in late 2010. In this paper, a disaggregated sector-wise analysis is done to perceive the growth trend of the income and Employment in Bihar, and the process of structural changes. This paper utilizes various development indicators data, income, and employment data from several rounds of employment survey for more than two decades (i.e., 1993-94 to 2018-19). The analysis result shows that Bihar is in the phase of structural transformation, as it is evident with a significant decline of income and workforce share of the primary sector and a continued positive growth rate of income. The sub-period analysis shows that Bihar has witnessed a golden period of growth during 2004-05 to 2011-12. Agriculture, construction, communication, and other services are the driving force toward the growth and structural change in the economy. Rural laborers are moving towards non-farm activity within rural areas, and are much dynamic than the urban area.

Keywords: Bihar, Structural change, Growth, Economic sectors, workforce

I. INTRODUCTION

The growth and development of an economy are one of the most important indicators of the people's well-being. Debate on growth and development is prominent in underdeveloped nations to understand the need and to sustain in the competitive world. Unemployment and poverty reduction are always being an integral part of development agendas and still in progress in third world countries. The pace of development of an economy depends on the mutual interrelations between the policies, politics, and administrative roles of the state. Indeed, the state has

a vital role in the development process as it is the agency for development and thus enhance the process of structural changes in the economy. Such changes in the economy are evident for economic growth and development. In this process, the composition of resources in terms of income/output and Employment reallocate, along with the changes in rural-urban texture in the form of labor movement and change in labor productivity for the overall growth of the economy (Lewis, 1954; Ranis & Fei, 1961; Hasan, Lamba, & Gupta 2013; Herrendorf, Rogerson, & Valentinyu 2014). Hence, for the economic development of an economy, the structural change is obvious; it is because structural change is important for modern economic growth (Syrquin, 1988). And for its continued growth, a set of interrelated changes in the structure of an economy is required (Chenery & Elkington, 1979). Such interrelated changes occur due to structural changes in the sectors in the form of movements of labor toward more productive sectors, i.e., from primary to secondary and then a tertiary sector of the economy.

As per national Industrial classification -2008, the Indian industries have been classified into three broad sectors, namely- primary sector, secondary sector, and tertiary sector. Within these broad sectors, there are many sub-sectors identified in numerous pieces of literature. The importance of these broad sectors varies based on the specific region and the available resources for utilization. However, there are ample development theories that suggest the role and importance of these sectors in the development process of an economy. At the primitive stage of development, the role of the primary sector is very important, as this sector employs a large section of society. Still, due to the limited capacity of growth, its importance declines in the development process. Whereas, the role of the manufacturing and service sector emerges as a significant factor for the overall development. It is because the manufacturing sector has ample scope of expansion through the proper utilization of capital and technology. On the other hand, the service sector has the maximum limit to expand. (Aggarwal, 2016; Aggarwal & Kumar, 2015).

Bihar's growth rate in the last decade seems very impressive and thus drew the attention of the scholars

and researchers to look at the growth trends and prospects. A state among the so-called “BIMARU”¹ states have started recovering from its annoyance. During the 90s, a very low and inconsistent growth rate of the state had suppressed the development process of the state (Singh & Stern, 2014). But, In the last decade, after 2005, the state performed well in all front in the regime of the newly formed government. It had witnessed a surprising growth rate in double-digit and ranked in top positions among the states of the nation in growth rate. A significant decline in the primary sector share and sustained growth rate of some of the important sectors are crucial for structural change in the economy. The growth of the service sector and its share in income is commendable in recent period. Governance, social structure, and policy implementation are some of the essential factors whose interaction leads on the way of development. Such interaction in Bihar proved efficient towards growth and development prospect for the state. The poverty Head Count Ratio (HCR)² has shown significant improvement regarding poverty reduction of about 20% in the decade (Tendulkar, 2009). Increased investment in development projects such as infrastructure, roads, electricity, etc. enhanced the growth speed of the economy. Thus it is in the process of structural change in the economy.

The phenomenal growth rate in recent decades compared to the 90s has to go a long way for sustained structural transformation of the economy. There is a lot to do in terms of curbing the rising unemployment, high migration rate, very low per capita agricultural land uses, low literacy rates and poor health infrastructure. After independence, Tamil Nadu, Andhra Pradesh, Gujarat, Maharashtra are the states who have grown at a faster rate due to heavy industrialisation with ample scope of employment generation. On the other hand, Punjab, Haryana, West Bengal, Andhra Pradesh are the states of India have proved their significance through proper mechanisation with the help of technology in the agriculture sector. But, the Bihar growth pattern did not show up like others. Therefore the pertaining questions arise that why Bihar's growth had not paralleled with other states? Why were the Structural changes in the economy so slow? Though, also it is evident that in the last decade, the economy has started reviving and accelerates to structural changes in the economy regarding income and Employment. Hence, it is a matter of investigation that what are the deriving factors of the recent growth of the economy and to what extent is it commendable and sustainable? These questions have been answerable in subsequent sections.

¹The 'BIMARU' term is refereed for the most underprivileged states of India. These states are Rajasthan, Madhya Pradesh, and Uttar Pradesh; Bihar

² HCR= Ratio of The number of person below poverty line to the total population of the economy.

Therefore, in the purview of the recent growth and development of Bihar's economy and structural changes, this is important to decipher the growth and development trajectory. For this purpose, the main objective of this paper is to understand the growth and development process of the state along with trends and patterns of Net State Domestic Product and the structural change in the economy. Further, the role of the various industrial sector has been analysed in the growth process. This paper adds value to the existing literatures in two ways. First, we have utilized the most recent data for Net State Domestic Product (NSDP) at the base price of 2011-12³ and the first Periodic Labour Survey (2017-18) data to update the workforce statistics. Secondly, this paper is based on the GSDP and workforce estimated for the undivided Bihar for the whole of the study period. Thus, this study covers a long period of more than two and a half-decade period under analysis (i.e., 1993-94 to 2018-19).

II. Data and Methodology

This paper analyses the pattern and trends of growth rate and the structural change of the Bihar Economy in the post-liberalization era. The period of analysis has taken from 1993-94 to 2018-19, which is later divided into three sub-period of analysis. The first period is from 1993-94 to 2004-05, the second period is 2004-05 to 2011-12 and lastly, the third is from 2011-12 to 2018-19. For this purpose, the paper utilize the income data through the net state domestic product of Bihar. The domestic product has been taken by the industries of origin in Bihar at the constant price of 2011-12. For this purpose, the income data from 1993-94 to 2018-19 of the various base year spliced into the same base price of 2011-12. Several rounds of Employment and unemployment survey (EUS) and first periodic labour force survey data has been extracted for the sector-wise employment data for Bihar (NSSO, 2014; PLFS, 2019). A national sample survey organization carries the labour force survey at a regular interval in India. The industry-wise sectoral classification has been done through national industrial classification- 2008. Whereas, the workforce estimation are based on both principal and subsidiary activity of worker based on usual status. Apart from this, various data set has been borrowed from various reports of the National Institution of Transforming India (NITI) database and the Economic & political weekly Research foundation (EPWRF). The method of analysis is purely exploratory and analytical. The growth rate has been derived by a simple average growth rate and compound average growth rate formula.

³To use the Net State Domestic product at the base rate of 2011-12, the Net State Value addition (GSVA) data has been spliced using 2011-12 as base year for the period of 1993-94 to 2018-19.

III. Economic Structure of Bihar

Bihar's economy is primarily agriculturally based, but experience service-oriented growth with the highest share in GSDP, during the last decades. The bifurcation of Jharkhand from Bihar in 2000 remnant it from the most important sources of growth - mining, quarrying and manufacturing base. This is now part of a new Jharkhand state. Due to this bifurcation, shares of the manufacturing sector, especially mining & quarrying in total GSDP of Bihar, and due to this Bihar economy went down by around 30% (See Appendix) (Mukherji & Mukherji, 2012). But, even after bifurcation, Bihar has been showing decent growth rates in both agriculture and service sectors with a slight growth of the secondary sector since the last decade. Though the structural transformation in an economy follows a certain process and it does not happen automatically. However, the transformation process depends upon several economic factors in the form of human capital, better infrastructure, institutions and industrial investments. This is why the process of structural change could be slow, rapid or episodic (McMillan, Rodrik, & Sepulveda, 2017). The nature of structural change could be either growth-enhancing or growth reducing. As it is evident in most of the countries like India and Thailand that structural change has contributed to the growth process of the economy in a positive direction. In contrast, there are some countries such as Argentina, Brazil, Nigeria, and Zambia where the structural change proved to be "growth reducing" (Ahsan, 2012; Mcmillan, Margaret S & Rodrik, 2011).

Before 2005, the economic growth and the acceleration of the economic growths were prolonged, and so the pace of structural change. But After the formation of the new government in 2005, the economic growth accelerated along with other development parameters that enhanced the way of structural change in the economy in the last fifteen years. In the case of infrastructure development, a total of 1723 mega, major & minor bridges have completed during 2005-06 to 2015-16 in which alone 1013 major and minor bridges were built under Mukhyamantri Setu Nirman Yojana. Extension of roads in the form of national and state highway with major district roads is impressive. The length of the National Highway has increased from 3410 km in 2001 to 4595 km in 2015. State highway had increased from 2383 km in 2011 to 4253 km in 2015. Also, the major district roads have been built from 7739 km (2001) to 10634 km in 2015. Almost 45% of households have been electrified up to 2017 with an increase from 52.83% of village electrification (VE) in 2005-06 to 95.50% in 2014-15. An annual average growth rate of 12.6% and 7% of electricity generation (EG) and installation of the capacity of power (ICP) respectively after 2005 (Figure 01). From 1999-00 to 2013-14, the expenditure on the capital sector and the social sector have increased many folds, but a

significant acceleration has started after 2005-06 (figure 02). Aggregate expenditure (AE), capital (CE) and social sector expenditure (SSE) have grown at an average growth rate of 16.70%, 14.94%, and 21.76% respectively from 2005 to 06 to 2013-14, much higher than the earlier period of 1999-00 to 2004-05 except capital expenditure. The social sector has been highly focused after 2005, with a significant increase in its allocation for expenditure.

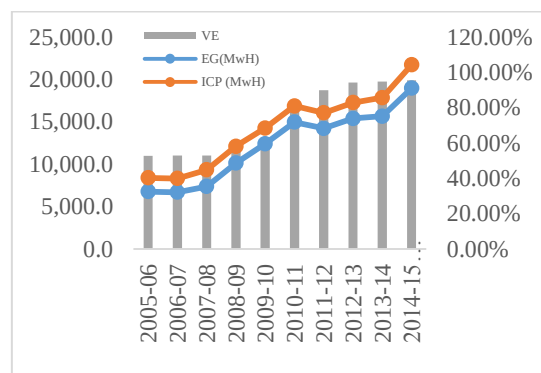


Figure 01: Trend of Village electrified, electricity generation and installed power after 2004.

Source: Own computation, data taken from Niti Aayog

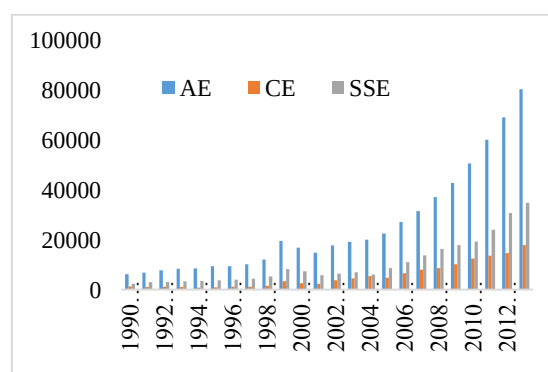


Figure 02: Trend of Capital, social sector and Aggregate expenditure in Bihar.

Source: Own computation with data taken from Niti Aayog. AE= Aggregate Expenditure, CE= Capital Expenditure, SSE= Social Sector Expenditure.

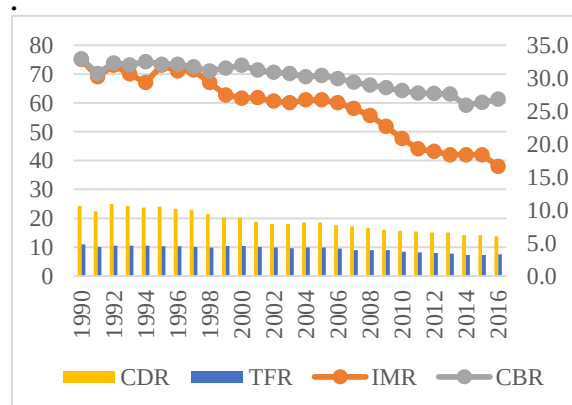


Figure 03: Trend of CDR, TFR, IMR, and CBR from 1990 to 2016

Source: Own computation, data taken from Niti Aayog

In the case of Health indices, a significant decrease in infant mortality rate and the birth rate has been recorded along with a minimal reduction in the crude death rate and total fertility rate (Figure 03). In 1990 Infant Mortality Rate (IMR) and Crude Birth Rate (CBR) were 75 and 32.9 respectively, which has fallen to 38 and 26.8 in 2016. At the same time, a sharp decline is evident after 2005 only in both IMR and CBR. Crude Death Rate (CDR) and Total Fertility Rate (TFR) declined from 10.6 and 4.8 in 1990 to 6.0 and 3.3 in 2016, respectively. After 2005, Jeevika Under the national rural livelihood Programme has been continuously working for poverty alleviation. School drops out in all sections has decreased in the state, though the literacy rate is still very low compared to other states. In view of such significant changes in all socio-economic segments and investment in the growth fundamentals, the structural changes should be consequences in the economy.

A. The Primary Sector

The primary sector is the basic and the most important sector of an economy. In the development process, initially, the contribution of the primary sector in the income is highest than the other sectors. Still, later it declines due to the limited capacity of expansion. The primary sector consists of five sub-sectors, namely- agriculture, forestry & logging, fishing, livestock and mining & quarrying in the estimation of Net State Domestic Product (NSDP). Some researchers consider mining & quarrying as a part of the secondary sector and some in the primary sector. Whereas, mining & quarrying has been subtracted from the primary sector for the estimation of agriculture and allied.

In developed economies, the Share of the agriculture sector in value-added ranges from 1 percent to 8 percent, whereas North American states have less than one percent contribution in total value-added. In India, the primary sector contributes to an average of 14 to 15 percent in net value-added. In the case of Bihar, the Share of the agriculture sector is reducing at an average rate of 2.19 % during P1⁴ (Figure 04). In 1993-94 primary sector was contributing 40.57% in overall NSDP, which has reduced to 19.70 % in 2018-19 shows a significant decline of 20.87 percent. Among the primary sector, during the years, fishing has been an almost constant share in total NSDP. Still, forestry & logging has recorded an average annual decline to nearly 3% during P1, followed by a growing share of Mining and Quarrying⁵ At an

⁴ P1 = Period of 1993-94 to 2018-19

⁵ This sector shows a large number for growth rate; thus seems significant, but it is not because of the high volatility of the sector throughout the year.

average rate of 34%. However, the Share of this sector is so minimal (0.35%) in the primary sector that it has no impact in the primary sector as well as the overall value-added of the economy.

It is to note that from 1999-00 to 2004-05, the Share of the primary sector and the agriculture sub-sector had gone up with a marginal increment of 1.12 % and 0.65 %, respectively, in the Share of NSDP. Whereas in just the next six years (2004-05 to 2009-10), there was a significant reduction of almost 9.93% and 6.08%, respectively. So a significant change can be seen in the primary sector after 2004-05 in terms of sectoral Share. More precisely, the trends of Share of the primary sector were highly volatile (ups and downs) till 2004-05, for the later periods, after 2012-13, the sector shows a continuous decline. The Share of agriculture and fishing in the primary sector has an increasing trend, whereas a decline has been observed for forestry & logging, while mining is showing a constant trend.

However, despite a lesser share of mining and quarrying either in GSDP or in the primary sector, it has recorded maximum growth rate in with an average growth rate of 31.30% and 14.08 % during P4⁶ and P3⁷, respectively. But during P2⁸ The growth rate of mining and quarrying was less than 2 %.

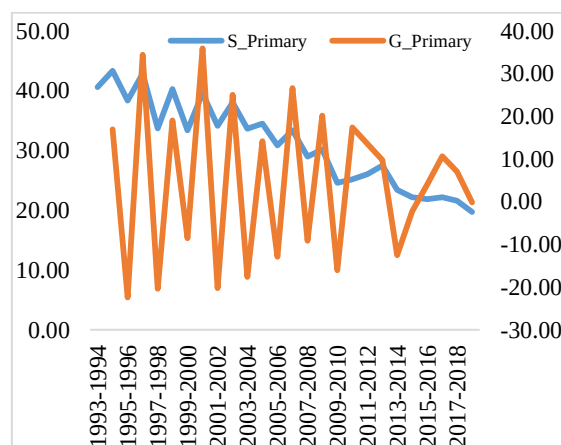


Figure 04: Share in GSDP and annual growth Rate of Agriculture and Allied sector.

Source: Own computation data are taken from DES, Bihar. S_Primary = Share of primary sector to GSDP, G_Primary = Growth rate of the primary sector.

This sector seems highly volatile in production, and so in growth rate, in 2013-14, it had the highest growth rate of 535.57 %, and in the subsequent year, it fell to -60.61 %. The nature of mining & quarrying is quite unreasonable and very difficult to explain; however, due to minimal Share in value-added, it

⁶ P4 = period of 2011-12 to 2018-19

⁷ P3 = period of 2004-05 to 2011-12

⁸ P2 = Period of 1993-94 to 2004-05

does not impact the overall trends of the sector. In NSDP, Agriculture and Fishing have recorded 4.47 % and 6.06 %, respectively, of an average growth rate during P1.

B. The Secondary Sector

Among the secondary sector, three sub-sectors are considered in the estimation of net domestic product, namely- manufacturing, construction, Electricity, Gas & Water supply. Manufacturing is one of the most crucial sectors that act as an agency for structural changes in an economy. An economy endowed with a good manufacturing base has such potential that it can grow faster than others. Unfortunately, Bihar had not any such types of support after the bifurcation in 2000, and most of the major industrial units and mines pulled down to the newly formed state Jharkhand. But after 2005, secondary sector has started reviving from his curse to some extent and is in the way of continued growth.

Figure05 and 06 explain that there was an increase of almost 5 % share of the secondary sector to total GSDP during P1. After 2004-05, about a 6 % increase (from 13.12% in 2004-05 to 19.05 % in 2018-19) in the Share of secondary sector has been recorded, with the highest Share of 20.85 % in 2014-15. The construction sector is the only sector whose Share has shown a significant rise from 1993-94 (2.39 %) to 2018-19 (9.72%) and hence reflects in the secondary sector. Particularly after 2004-05, this sector has speeded up from 6% to 12% of Share to total GSDP with the highest 13.69 % average growth rate of Share to total GSDP during P3. But in the later Period of P4, it slowed down to 2.28%. Most importantly, the Share of manufacturing has decreased by 1.47 % along with electricity & gas (0.74 %) during P1.

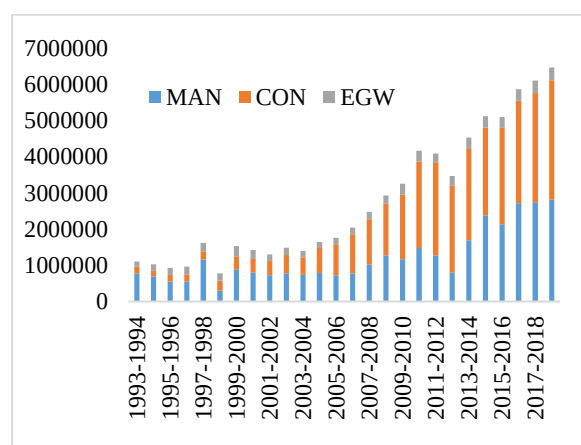


Figure 05: Gross State Domestic Product of Secondary sector in Lakhs

Source: Own computation data taken from DES, Bihar

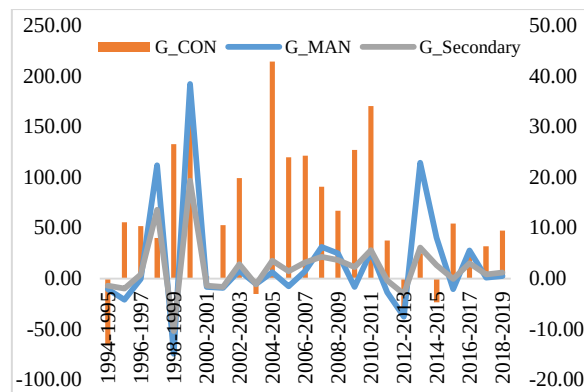


Figure 06: Growth rate of secondary sectors.

Source: Own computation data taken from DES, Bihar

Among the secondary sector, construction contributed more than 50% in the secondary sector in 2018-19. It has increased substantially from 17.15 % to 51.02 %, with an increase of 197 % and an average growth rate of 13 %pa. The declining Share of manufacturing, and electricity, gas & water supply sub-sector to secondary sector is worrisome. From 2004-05 to 2011-12, construction is the only sector whose average growth rate of Share in secondary sector was positive (13.69 %). But the same is not true for the next P4 period. However, we do see some momentum in manufacturing sector in P4 but very little growth rate for construction sector. The most favorable period for the construction was P3, where it grew at a rate of 23.69 % per annum.

C. The Tertiary Sector

The tertiary sector consists of broadly eight sub-sectors. It is the largest sector in the economy among all three sectors and also contributes most to total domestic product. The Share of the tertiary sector has increased by 15.75 % during P1, which picked up from 45.50 % share in 1993-94 to 61.24 % in 2018-19. The service sector has recorded the maximum growth among other two sectors of about 9 % of average annual growth rate during P3 and 8.30 % during P4, but during P2, its average growth was least (5.68 %). However, its average annual growth rate of Share in overall NSDP was only 1.51%, 0.49% and 1.53% during P2, P3, and P4, respectively (Figure 07).

Among the service sector, trade hotels& restaurants and other services have the highest Share in both NSDP and among service sector. But Communication, B&I, and THR are growing much faster than others. Share of communication had a consistent increment from 0.88% in 2008-09 to 2.86% in 2015-16 with an average annual growth rate of 25.80%. Though the Share of communication is less than one percent on average, it had recorded the highest average growth rate of 28.10% during P3. Moreover, THR's Share has increased by 6.17% with an average growth rate of 9.59% during P2, but later

on the subsequent period of P3 and P4, the share increase marginally by only 1.59% and 1.02% respectively. Though, Banking & Insurance has also improved in the Share with an increase of 3.16% and with an average growth rate of 11.47% during P1. But the maximum growth in Share has been recorded for B&I during P3 at the rate of 14.96%. (figure 08). Railways, Storage, Transport by other means, real estate, and Public administration has an almost constant share to total GSDP during the years. Though railways have recorded a negative growth rate during the periods along with public administration and other services in P1. Despite having a larger share of THR and other services among service sector, growth rate is minimal, even negative in case of other services. Only communication in Service sector has been increasing at a substantial rate either in Share or growth rate.

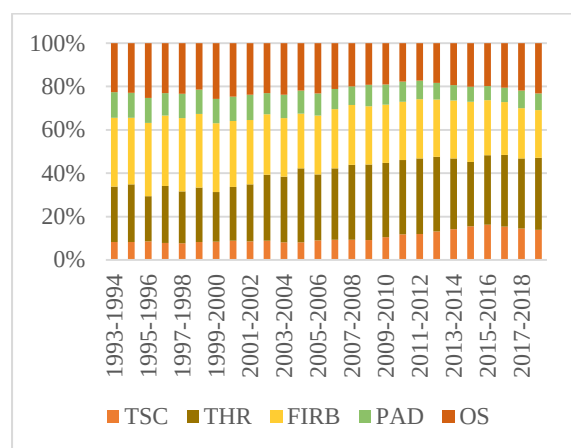


Figure 07: Gross State Domestic Product of Tertiary sector in □ Lakhs.

Source: Own computation data taken from DES, Bihar

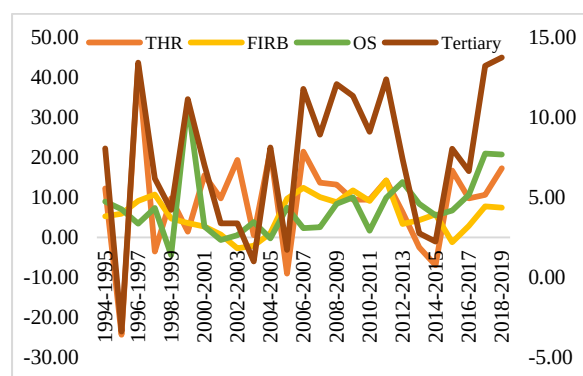


Figure 08: Trends of Growth rate of the Tertiary Sector.

Source: Own computation data taken from DES, Bihar

IV. Structural Changes in the Economy

Structural change in an economy occurs at both micro and macro level. In the case of micro-level, structural change is concerned with the functioning of

economies, in the context of markets, institutions, a mechanism for resource allocation, income generation and its distribution. The macro-level analysis focuses on economy-wide phenomena such as industrialization, urbanization, and agricultural transformation. This occurs in the form of change in the Share of income and employability across the sector and overall growth in terms of income and productivity. So, at the macro level, the structural change in income has been analyzed in this paper in terms of net state domestic product. The analysis shows that the Bihar economy grew at a compound annual average growth rate of 5.61% during 1993-94 to 2018-19 (Table 04). The economy had recorded significant double-digit CAGR for most of the sub-sectors for period P3 (2004-05 to 2011-12) and an overall growth rate of around 9 %. The growth trends of the three broad sectors in several sub-period of estimation appear as inverted 'U' shaped (Figure 09). For the same period, gross state domestic product (GSDP) has reached a double-digit growth rate, as pointed out by many scholars (Gupta, 2010; Santra, Kumar, & Bagaria, 2014). At the same time, the least growth rate was in the first period of 1993-94 to 2004-05.

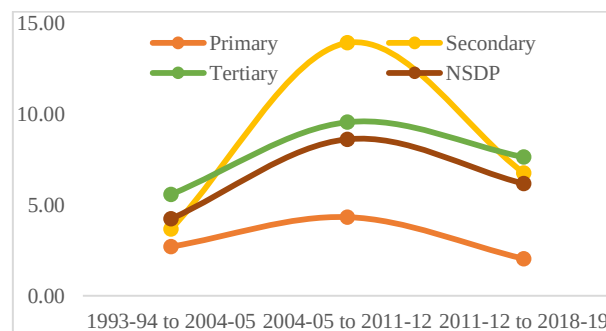


Figure 09: The trends of sectors for several sub-periods.

Source: Author's estimation.

For the primary sector, agriculture has recorded a significant fall of 20.87% share in overall NSDP with compound average growth rate of 2.33% in P1. Despite a high growth rate of 31.30% from 2011-12 to 2018-19 for mining & quarrying, its Share in the NSDP and also among the primary sector are not significant. However, the decline in the Share of primary sector was most observed due to a decline in agriculture sub-sector only.

In the case of Secondary sector, the role of construction sector was significant in both the contribution to NSDP and in terms of growth rate in P3. Though, during the later period, the compound growth rate for construction (3.59%) was the last among three periods. Moreover, the CAGR for manufacturing sector had gone up from 0.11% in P2 to 12.03 % in P4. Communication has emerged as a significant sector among the tertiary sector after 2008-09. It has recorded a maximum growth of

28.79% in P3, followed by banking and insurance with 16.13% and trade, hotel & restaurant by 9.95% in terms of CAGR. Wherein, the Share of tertiary sector in GSDP has increased by 15.75% from 45.50% in 1993-94 to 61.24% in 2018-19.

If we look at the employment statistics as shown in Table 02 and 03, the NSSO employment unemployment survey and periodic labour force survey data of 1993-94 to 2018-19 revealed that in the rural sector, for the given period, almost 37 % working person had moved out from primary sector. Whereas, in urban sector, the decline was about 7 %. But overall (including rural and urban areas), there was a significant decline in primary sector workforce employment by 35.52% from 80.69% in 1993-94 to 45.17% in 2017-18. In contrast, for secondary sector, a significant increase of 21.13% of the working person in rural and 9.72% in urban sector has to boost up the secondary sector employment during P1. The growth of Employment in secondary sector was highest during P3 in comparison to other two sub-periods. The increment in the workforce in secondary sector was due to an increment of workforce in construction sector.

In comparison to above two sectors, service or tertiary sector has recorded very little growth in the working person. It has increased by a marginal number of 16.09% in rural areas but a decline in the workforce by 2.4% in urban areas. This is quite interesting to note that the behavior of rural and

urban areas is very different. However, the tertiary sector is still the most employable sector than others. It hence contributes about 67% of a total working person in an urban area, whereas primary sector was the most employable sector in rural areas by about 48.85% in 2017-18. The overall rural sector has performed much better in the period P1 regarding the secondary sector, as the working persons moved off from primary sector had entered non-farm activities mostly in secondary sector rather than in the services sector. Whether in an urban sector the working persons moved off from the primary sector has equally incorporated in the secondary and tertiary sector. According to the study of structural change in the Indian economy, in the rural sector, the labourers are migrating towards the non-farm sector much within the rural areas rather than going to urban, and there is a feminization of agriculture sector (Binswanger-Mkhize, 2013). Though in case of Bihar, the trend is similar to in the Indian context. Due to the migration of male workers, female workers have become more mobile towards village activity, i.e., Agricultural and non-agricultural works. Whereas remittances sent by migrant people have upgraded the rural living standard, but also agriculture is the driving force for the growth of the economy due to a modest growth rate. (Sharma & Rodgers, 2012; Sharma & Rodgers, 2015). So, the structure of men's Employment has changed faster over time than that of women.

Table 02: Percentage of working person (PSSS) by broad industry division in different sectors of the Economy

Economy		Year/Period				Absolute Change			
Sl. no	Sector	1993-94	2004-05	2011-12	2017-18	1993-94/ 2004-05	2004-05/ 2011-12	2011-12/ 2017-18	1993-94/ 2017-18
RURAL									
1	Primary	86.07	78.06	67.66	48.85	-8.01	-10.4	-18.81	-37.22
2	Secondary	4.16	8.28	15.16	25.29	4.12	6.88	10.13	21.13
3	Tertiary	9.77	13.66	17.18	25.86	3.89	3.52	8.68	16.09
URBAN									
1	Primary	15.99	20.7	9.47	8.67	4.71	-11.23	-0.8	-7.32
2	Secondary	15.94	18.78	23.82	25.66	2.84	5.04	1.84	9.72
3	Tertiary	68.07	60.52	66.72	65.67	-7.55	6.2	-1.05	-2.4

Source: Organized by from 64th and 68th round NSSO data

Table 03: Share of Different sectors and workforce (PSSS) of the economy to overall NSDP

Years	Share in GSDP			Share of Workforce		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
1993-94	40.86	13.7	45.44	80.69	5.07	14.24
1999-00	33.77	15.09	51.15	76.83	8.36	14.81
2004-05	33.5	13.75	52.74	73.5	9.12	17.39

2011-12	25.76	18.76	55.48	62.45	15.93	21.62
2017-18	19.65	19.13	61.22	45.17	25.32	29.51

Source: GSDP data are taken from DSE, Bihar and 2011-12 data of workforce are taken from NSSO.

In the rural sector, the continuous decline of labour employment in agriculture and continuous acceleration of Employment in service sector is evident, but the pace of this change seems very slow. Construction has recorded similar growth patterns in

both rural and urban sectors with an increasing share of labour employed in the economy while declining in urban sector manufacturing but constant employment in case of the rural sector in the period above.

Table 04: Sector-wise Compound Annual Average growth rate for several periods.

Sl.No.	Industry	1993-94 to 2018-19	1993-94 to 2004-05	2004-05 to 2011-12	2011-12 to 2018-19
1	Primary	2.33	2.71	4.33	2.04
1.1	Agriculture and Allied Activities(AGR)	2.27	2.71	4.31	1.83
1.1a	Agriculture	1.34	2.52	5.19	-1.86
1.1b	Forestry and Logging	2.32	3.59	-1.97	5.13
1.1c	Fishing	5.38	6.78	1.46	8.32
1.2	Mining and Quarrying(MIN)	10.23	1.41	14.08	31.30
2	Secondary	7.65	3.68	13.92	6.77
2.1	Manufacturing(MAN)	5.77	0.11	7.16	12.03
2.2	Construction(CON)	12.75	12.50	20.67	3.59
2.3	Electricity, Gas and Water supply(EGW)	3.03	1.55	5.40	5.63
3	Tertiary	6.93	5.59	9.56	7.63
3.1	Transport Storage and Communication(TSC)	9.16	5.47	15.64	9.89
3.1a	Railways	4.06	1.06	8.27	4.91
3.1b	Transport by other means	7.66	3.94	9.01	13.24
3.1c	Communication	14.76	16.44	28.79	4.04
3.2	Trade, Hotels and Restaurants(THR)	7.90	8.35	9.95	6.95
3.3	FIRB	5.48	3.44	10.84	4.27
3.3a	Banking and Insurance	10.65	8.87	16.13	8.96
3.3b	Real Estate, Ownership of Dwellings and Business Services	4.16	2.57	9.40	2.32
3.4	Public Administration(PAD)	5.19	4.62	5.99	6.09
3.5	Other Services(OS)	7.00	5.26	5.96	12.24
4	Net State Domestic Product (NSDP)	5.61	4.24	8.62	6.17

Source: Own computation, data taken from DES, Bihar.

V. CONCLUSIONS

This paper attempts to understand and analyse the growth and employment dynamics for Bihar. This is important to perceive the essence of structural change in the economy as a driving force of development. The analysis of growth rates of the sectors and its contribution to the income and Employment have a sound prospect. For more than two and half decades of 1993-94 to 2018-19, the economy has recorded an average growth rate of 6.30% with a significant decline of the Share of the primary sector of about 35.52% and an increment in the share of secondary and tertiary sector of 20.25% and 15.27% respectively. The structural change in the economy, either in growth rate or Share to total NSDP exhibits a unique phenomenon. The growth rates and the shares primarily manifest the increase or decrease

of each broad sector is due to only changes in one or two minor sectors of the broad three sectors and have more substantial effects on the overall growth of the sectors. Though in the overall period only five sectors have a share of almost 75% to total GSDP, namely Agriculture & allied, construction, transport, communication, trade, hotel & Restaurant and Other Services, rest comes to quarter. Where from 2001 to 2010, more than 74% share in growth is contributed by only four sectors- Agriculture & Allied, Construction, Trade, hotel and restaurant and Communication (Gupta, 2010). Though mining and quarrying have a minimal share either in total GSDP or primary sector but its Share is growing very fast with the highest growth rate.

Construction is the only deriving factor in the secondary sector whose growth rate was phenomenal

during P2 but declined in P3. However, still construction sector provides most of the workforce. Also, it is a matter of concern that it provides only temporary Employment of the labour forces in the informal market without social security. For growth driven structural changes, indeed, the manufacturing sector should grow with larger employment of the labour forces followed by others. Therefore, the manufacturing sector should be grown for commendable structural changes in the economy. Trade, hotel, and restaurants can't be the growth deriving factor after 2005 because in P2, its growth rate and share in GSDP were higher than the growth rate and share in P1 and P3, but the difference between the periods was very small. So there are no growth-driven changes that were evident due to THR. The communication sector has also shown a significant growth trend after 2007, mostly due to central level policies change and an increase in mobile connections, which has increased from 12.64 telephone connection per 100 population in 2007 to 51.20 in 2015.

In a nutshell, the P2 sub-period had a significant impact on the Bihar economy than the other periods. In this period, the economy has witnessed a commendable growth rate and dynamism in employment share among the sectors. In the given period, data shows the reallocation of output and Employment, which has enhanced the growth process in the state, but the pace of structural change is plodding. The structural change is evident across the sectors regarding employment, but it is within the sectors due to the labour movement and changing employment structure between the rural and urban sectors. Overall, Bihar's economy is performing well right from the ruling of the new government in the economy under the motto of "good governance" or "Sushasan." The expenditure on development has also increased many folds, mainly focus on the infrastructure, water, electricity and road constructions. In social sector expenditure, health and education front but still more and more pro-development policies are required to fasten up the growth process of the economy. Poverty Headcount ratio has decreased significantly by 20.7% with the increase of per capita income is mostly due to poverty alleviation programs like JEEVIKA and rural non-farm income along with remittances. But still millions of people are in poverty with increasing population and without secured Employment, mostly dependent on agriculture production in rural areas.

VI. The Way Forward

Bihar's growth story seems fascinating and as well such a growth rate proved that even a so-called BIMARU state could grow backed upon the political will and good governance. But such structural changes in the economy are in itself questioning and thus forced to rethink the process of growth and structural changes. The theoretical aspect of the

structural change emphasis on manufacturing growth as an important factor. Several papers advocate significant structural changes in agricultural and service sector but not in secondary sector in recent years in cases of Bihar (Santra, Kumar, & Bagaria, 2014). But the question is that being an agrarian state, the low growth rate of industries and dependence on service sector is sustainable, or it will pave the way towards the development or is it only a supposititious? Is this development process de facto able to upgrade the living standard and well-being of the society or lead to structural transformation?

Indeed, the manufacturing sector is still stagnant over the period and cause a huge migration of workforce to other states in search of Employment. However, the growth rate achieved by agriculture and some service sectors is commendable. Still, questions arise whether such growth rate sustainable and able to map up the increasing demand for Employment to the large population shortly. Such biased growth in the sectors may lead to demand and supply problems in the economy. So, for a positive structural change in the economy, the growth of the manufacturing sector, as well as a strong base of primary sector, are not only important, but it is much needed for the balanced growth of the economy.

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Appendix

Table 01: Structural change between undivided and divided Bihar.

Sector	Values (Rs. million)		Composition (%)	
	Pre-bifurcation (1999/2000)	Post-bifurcation (2000/2001)	Pre-bifurcation (1999/2000)	Post-bifurcation (2000/2001)
Agriculture and Allied	136,550	214,960	32	41
Construction	19,170	18,720	4	4
Industry	52,570	33,560	12	6
Services	21,929	25,448	51	49
GSDP	427,580	52,173	100	--

Source: Mukherji and Mukherji.



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