CHAPTER ONE

INTRODUCTION

1.1. Importance of Productivity and Wages in Economic Development

Productivity, in its broader sense, is a measure of how effectively the economies of resources are translated into the production of goods and services. Over long periods of time, productivity is the single most important determinant of a nation’s standard of living. There is a common perception that productivity growth and economic growth is closely related. Most of the discussions in the literature focus on the role of productivity growth towards economic growth. By definition, output growth is the sum of growth of employment and labour productivity growth (Steindel and Stiroh, 2001). Thus, a higher productivity growth seems to imply a higher GDP growth. However, the relationship between these two variables may be the other way round in some developing countries, which experienced high productivity growth due to economic growth. The argument runs like this: a higher economic growth seems to imply higher national or per capita income growth. As we know, income is a function of innovation or technology; higher income growth is due to innovation or due to more investment. So, growth of technological progress or investment will lead to growth of productivity.

Labour productivity growth and economic growth can be related in the context of standards of living. How is productivity associated to per-capita income growth or standards of living? To make the connection, we need to make the links between the production side of the economy and the way in which production determines income. In most of the western economies, income is generated in factor markets. It is the value of services of labour and earnings of assets that occur as a consequence of supplying these factor services to the producers of goods and services. Income from a given supply of labour and capital can rise because either (a) the value of the good produced has increased or (b) because the productivity of those factors has risen. Higher productivity
implies that more goods and services can be derived from the same factor inputs. An increase in growth of labour productivity is always a ground for workers to push their claims for higher wages. If the increase in productivity is due to the effort of labour or their improved efficiency, wage rate of the workers will increase. The increase in wage rate of the workers will lead to higher income and subsequently higher standards of living for them. So, there is a positive relationship between growth of labour productivity and per-capita income growth.

Thus, the beneficial effects on productivity growth can be evaluated at the level of individual worker or industry, as well as at the macroeconomic level at large. For workers, an increase in productivity ideally leads to higher wages, allowing them to take home higher pay. For the industries, higher productivity results in lower unit costs of production and thus higher profit that can be reinvested and also distributed to the workers in the form of higher wages or more employment. Higher productivity also leads to important macroeconomic benefits. Aggregate demand stimulates productivity growth, both directly and indirectly. The direct stimulus comes from workers who are also consumers with higher disposable income to spend as a result of wage gains arising out of the improvements in their productivity.

The indirect stimulus to consumption arises through the price channel: lower prices resulting from improved productivity are the equivalent of an increase in real income for people. So, productivity contributes to a country's standard of living, as the most fundamental barometer of living standards is the earnings that people make and the determinants of those earnings is the productivity. The impact of productivity growth in any one sector of the economy depends upon the existence of "compensatory mechanisms" through which the economy adjusts. As such, productivity changes in microeconomic level have important macroeconomic ramifications. In other words, productivity increase in one sector could shift the composition of consumer demand economy-wide.1

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1.2. Statement of the Problem

India’s post-independence development plans have emphasized industrialization as a very important instrument for sustained growth. As a result, in 2004-05, the annual growth rate of industrial production of total industry was 8.9 per cent, which was higher than country’s overall economy growth. Manufacturing plays a pivotal role in the industrial sector of this country and carries a weight of 79.3 per cent out of total industrial sector in 2004-05 (Economic Survey, 2004-05). Manufacturing growth started accelerating in the 1980s and got further stimulus in the 1990s. At present, Indian manufacturing constitutes nearly one fifth of the economy. It employs nearly 1.8 million people in the organized sector and contributes more than 75 per cent to India’s export in the year 2001-02.2

Today the main objective of Indian government is to promote economic growth with equity. In order to achieve the higher economic growth in the overall economy, it is necessary for the government to look at the sectoral economic growth. Even though the service sector of India is booming, it cannot eradicate the unemployment problem where, large number of labourers has below secondary education. Service sector is only absorbing the educated mass having technical skill. It is the manufacturing sector, which can promote the economic growth and, at the same time, generate mass employment. Although the performance of the manufacturing sector is impressive, growing on an average more than 7.5 per cent after 2002-03, it is still below the average growth rate of total industry and below target growth rate of tenth plan (Economic Survey, 2005-06). At the same time, with regard to productivity in manufacturing, the overall conclusion in the literature is that the Total Factor Productivity (TFP) is growing, but at a slower rate than in the pre-liberalization period (Economic Survey, 2005-06).

Despite a steady growth over the several decades, Indian manufacturing faces stiff competition from other developing economies in Asia and elsewhere both in domestic as well as global markets. The important requisite, which is needed for competitiveness is enhancement of productivity. Being a labour abundant economy, India could boost the

2 WTI, 2003: 199.
productivity by higher wages to the employees, innovation and technology, work practices, restructuring of industries and enterprises, reallocation of resources, free mobility of factors and free exit of firms. So, the issue of productivity and employment in manufacturing sector is the only route to make Indian manufacturing a global manufacturing hub.

Productivity studies gained prominence in India in the late 1950s and early 1960s, when development was basically growth oriented. The economic reforms have led to a revival of high economic growth, relatively higher employment growth, a substantial boom in exports and market declining inflation. In 1990s the overall economic growth accelerated significantly. The growth recovery has been accompanied by much lower deficit in the balance of payments, drop in inflation below the historical average of around 8 per cent along with a reduction in the gross primary fiscal deficits to its lowest level. The major policy changes initiated in the industrial sector since July 1991 include removal of entry barriers, reduction of areas reserved exclusively for public sector, rationalization of approach towards monopolistic and restrictive practices, liberalization of foreign investment policy, far-reaching liberalization of import policy with respect to intermediate and capital goods, measures to bring about regional balance especially the development of backward areas and encouraging the growth of employment intensive small and tiny sector.

A labour abundant economy like India could take advantage of globalization of production and investment by exporting more labour-intensive products. Growth of labour productivity is essential to reap this advantage, stemming from the opening up of the economy. In addition to labour productivity, wages too play an important role in competing at the global markets. Higher wages lead to higher income of the worker and thus, the willingness and ability to work of the worker will stimulate. Moreover, unless the employers find it profitable to employ more labour, job creation and employment growth in the manufacturing sector gets hampered in a market driven economy. An analysis of labour productivity and wages thus becomes imperative to decipher issues relating to competitiveness, productivity and employment growth.
In the present study we would be attempting to examine the growth of total factor productivity, labour productivity, wages and labour cost in the manufacturing sector. We consider the period since 1970's to examine the effects, if any, of the changes in the policy regime. As no country can have cost advantages in all product lines, aggregation across industries could mask the inter-industry variations. Our analysis will be at the disaggregated level limiting to the two-digit level of desegregations of the National Industrial Classification. Further, as there exits the possibility of regional variations within a country, especially in India with its geographical size and non-uniform factor endowments, we intend to examine the state wise variations in labour productivity, wages and labour costs. The study also aims to examine the reason for spatial variations in the growth rates of labour productivity in manufacturing sector. This would enable to identify the “leaders” and “laggards” calling for appropriate investment policies. Furthermore, the study attempts to examine the long run impact of wages and employment on labour productivity in the manufacturing sector of India. This will help us to derive effective policy implications to confer whether manufacturing sector is the engine of growth in Indian economy.

1.3. Review of Theories

The study reviews both classical and neoclassical theories relating to wages and productivity. Classical economic theory postulated a dichotomy between ‘real’ and ‘monetary’ theory. In the former, relative prices, including the real wages of various types of labour as a homogenous factor, were determined by the interaction of tastes, technology and factor supplies, on the assumption of individual maximizing behaviour in competitive markets. In the latter, the price level is determined by quantity of money. The Wage Fund Doctrine of Mill is based on short run period. The size of the wage fund in any society depends upon the capitalist’s decision as to how much is to be spent on labour. Wages depend upon the demand and supply of labour. Population theory of Malthus says that, population grows in geometric progression while growth of food production will be at the arithmetic progression. So, increase in wages would cause workers to reproduce and thereby increases the supply of labour. In the long run, through the variation in population, wages tend to be fixed at the minimum of subsistence level.
Neoclassical theory suggests that in a sufficiently competitive world the wage rate paid to the labour will be equated with its marginal contribution to the output of the economic activity. In such a world, it can be argued that labour is being paid according to its productive contribution. However, if noncompetitive conditions are the rule, the possibility exists that workers may be paid less than their marginal product, with the difference reflecting an element of monopsonistic and/or monopolistic exploitation. Marginal productivity theory basically dominated after 1870. The theory says maximization of profits by the firm requires that, at equilibrium condition the price of each factor of production be proportional to marginal physical productivity and the value of marginal productivity of each factor be equal to its price.

Some of the studies have tried to establish the linkage between wage and productivity at a theoretical level. Leibenstein’s (1957) analysis says that wage is related to productivity through the nutritive value of food intake. A higher wage level enables the worker to increase the caloric content of his diet and this in turn will cause an increase to the amount of effort that he supplies. A proposition by Davis and Hitch (1949) indicates that, over the long run as productivity increases, a rising level of money wage with a stable price level is preferable to a stable level of money wage with falling price level. According to Kerr, Clark (1949), wages and productivity, in the short-run, may be linked together primarily in three ways: (1) direct linkage of productivity and wages, (2) indirectly through profits, and (3) indirectly through prices.

1.4. Review of Empirical Studies

Empirical studies pertaining to wage and productivity can be grouped according to respective issues. The first stream of studies viz., Dunlop (1948), Ross (1950), Garbarino (1950) and Meyers and Bowlby (1953) concentrated on inter-industry wage structure and productivity analysis. Dunlop (1948) focuses on particular variables as explanation of variation in the inter-industry wage structure. His evidence explores the effect of productivity as measured by output per man-hour as the explanation of a major portion of the observed variation in wage rates. Ross (1950) did not find any relationship
between labour productivity and real hourly earnings. Garbarino (1950) finds that the variables of productivity, concentration and unionization are capable of explaining the major portion of wage differential movements. Meyers and Bowlby (1953) attempt to consolidate the argument by a statistical examination of the relationship between productivity changes and changes in the inter-industry wage structure from 1923 to 1950 for thirty-eight US manufacturing industries. The general conclusion from their study is that in the present institutional setting, one needs to look for the factors other than changes in productivity to explain relative wage changes between industries.


A set of studies like Strauss and Wohar (2001), Wakeford (2004), Lindbeck (1983), Giersch and Wolter (1983) has investigated the long run relationship between wages, productivity and prices. In the Indian Context, several studies like Nagaraj (1994), Goldar (2000), Tendulkar (2003), Bidhe and Kalirajan (2004), and Banga (2005) have focused on the employment growth and labour productivity growth of organized manufacturing sector. But none of these studies examined the long run relationship among these variables.


In the light of the above empirical studies and the research issues discussed above, we can trace some research gaps that exist. First, the inter-industry wage structure and labour productivity analysis has not been focused. This researchable issue can provide us the information required to understand the direction of wages and labour productivity over a period of time. It is more meaningful and important in the context of Indian economy, especially for the manufacturing sector. This is because the Indian manufacturing sector, a key component of the overall economy, is showing a sharp decline in performance.

The second issue relates to measurement of Total Factor Productivity. Another lacuna in the literature on this topic is on the methodological ground. There has not been much attempt in this context to explain a method for decomposing the TFP growth
into technological progress (TP) and changes in Technical Efficiency (TE) within the framework of the time varying coefficients frontier production function. The translog production function, as used in this study, is more appropriate to describe the production activities at the industry level rather than at aggregate country level.

The third issue narrate the impact of wages, employment and prices on productivity has not been discussed much in the Indian literature. This issue has several important macroeconomic implications. It provides the trade-offs between wages and productivity and between employment growth and productivity as a part of development. The underlying hypothesis is that there will be trade-offs between productivity growth and employment, due to structural changes – which would lead to the displacement of the workers. But, in the long run, higher rate of productivity growth has been accompanied by higher rate of employment growth. Similarly, higher wages will increase the productivity because of the worker’s extra effort and attentiveness. But higher wages will reduce the employment as technological progress improves the efficiency of the production process, allowing industries to produce more output with fewer workers. This research issue needs to be explored in the context Indian manufacturing.

Regional industrial disparities in manufacturing sector arise, initially, due to the differences existing in the endowment of natural resources, industrial location, investment climate and many other factors. When development process starts in the economy, each region grows at a different rate because of the initial disparities among them. So, even if we are considering the single manufacturing sector, still inequality in terms of output and employment may exist because some regions of the country continue to be backward in glaring contrast to certain others which are relatively advanced. So, the issue of inter-regional wage structure and productivity analysis has hardly been discussed in the literature. This broad issue will help us to examine whether the industrial disparities in terms of output and employment in manufacturing sector has increased or decreased after the economic reforms across the states.
The fifth issue pertains to determinants of labour productivity across the states. Kumar (2002) has discussed regional variations in labour productivity growth in Indian manufacturing sector. According to him, higher labour productivity is one of the important factors influencing the investment decision in regional context. But it may not be true always. In India there are some manufacturing industries, which are labour intensive and having higher labour productivity. In such cases the foreign investors may not take more interest to invest in these industries. So, there are several factors affecting variations in labour productivity growth. One factor, which affects labour productivity in a particular region, may not affect the labour productivity in other region in the same period. In this context, this study proposes to identify important factors that determine the labour productivity growth of manufacturing sector at the state level.

The last issue, which warrants attention, is productivity convergence of Indian manufacturing sector across major states. This issue has not been discussed in Indian context. The productivity convergence analysis will help the government to identify whether the manufacturing industries, which are located in poorer states, are converging towards the rich states or not. If the poorer states ‘catch up’ with the rich states in terms of productivity then it will increase the inter-state competitiveness. Since technological change is the main driving force behind economic growth, the issue of productivity convergence obviously bears important implications for the national welfare distribution.

1.5. Objectives of the Study

In light of the above discussion the specific objectives are as follows:

- To examine the inter-industry wage structure and labour productivity analysis at the two-digit disaggregate level in the manufacturing sector during 1980’s and 1990’s.
- To analyze technical efficiency change and role of productivity change in economic growth by using stochastic production frontier at the two-digit disaggregate level data within manufacturing.
- To investigate the impact of wages and employment on labour productivity in the case of Indian manufacturing.
➢ To examine the inter-state inequality, wage structure and labour productivity analysis in the manufacturing sector.
➢ To determine the factors that is affecting the labour productivity in the manufacturing sector across the Indian states.
➢ Test for convergence of labour productivity in the manufacturing sector across the Indian states.

1.6. Analytical Tools

In order to analyze the growth and trends in labour productivity, gross value added per employee as well as gross value added per worker have been computed. This standard definition of labour productivity has also been examined at the state level. Trends and growth rate in wages have been presented in terms of real wages, money wages and product wages.

In order to study the determinants of wages at the industry level, the study has used both pooled regression analysis with the correction for heteroscedasticity and autocorrelation and panel data model. We use panel data model for controlling individual heterogeneity of the industries. It also gives more informative, more variability, more degree of freedom and more efficiency. In the case of panel data model, the error term $U_{it}$ is a composite residual consisting of (1) time invariant industry specific components $\mu_i$, which captures various characteristics of the industry, which are not observable but have a significant impact on the industry's wage determination (2) industry invariant time specific effects $\lambda_i$ and (3) a disturbance term $\varepsilon_{it}$, which is assumed to be serially uncorrelated with mean zero, and is possibly with heteroscedasticity.

In order to analyze the technical efficiency change and role of productivity change in economic growth, we consider the time-varying stochastic production frontier, originally proposed by Aigner, Lovell & Schmidt (1977) in Tran slog form as

$$\ln y_{it} = \alpha_0 + \sum_j \ln x_{ijt} + \alpha_t + \frac{1}{2} \sum_j \beta_{ij} \ln x_{ijt} \ln x_{ijt} + \frac{1}{2} \beta_{ii} t^2 + \sum_j \beta_{ij} \ln x_{ijt} + \varepsilon_{it} - u_{it} \quad (1.1)$$
In equation (1.1), \( y_{it} \) is the observed output, \( t \) is the time variable and \( x \) variables are inputs, subscripts \( j \) and \( i \) index inputs. The efficiency error, \( u \), accounting for production loss due to unit-specific technical inefficiency, is always greater than or equal to zero and assumed to be independent of random error, \( v \), which is assumed to have the usual properties. The above specification allows the estimation of both Technical Progress (TP) in the stochastic frontier and time-varying technical efficiency. TP is neutral if all \( \beta_{ij} \)'s are equal to zero. The production function reduces to the Cobb-Douglas function with neutral TP if all the \( \beta \)'s are equal to zero. The distribution of technical inefficiency effects, \( u_{it} \), is taken to be non-negative truncation of the normal distribution.

In order to examine the long run relationship between labour productivity, wages, employment and prices for aggregate manufacturing, the study has used the Johansen and Juselius multivariate cointegration analysis. To analyze the impact of wages and employment on labour productivity at the two-digit disaggregate level, the study has adopted the Panel cointegration (PCONT)\(^3\) technique. A PCONT model is best suited because of the following reasons:

- The pooling of the data for seventeen two-digit manufacturing industry over twenty-seven years will increase the degrees of freedom and also it will enable exploring the co-movement of the variables.
- It will also enable to allow the short-run dynamics to be potentially heterogeneous.

In order to estimate the PCONT relationship among the industry specific variables, the PCONT model is described as follows:

\[
LP_{it} = \alpha_i + \beta_i X_{it} + V_{it} \tag{1.2}
\]

Where, \( LP = \text{Labour Productivity of 'i' industry at time period } t \). \( X_{it} = \text{Vector of right hand side variables at time 't' for cross-section units 'i'}. \) In our study, the variables are real wages and employment. \( \beta \) is coefficient vector and \( V_{it} \) is the error term assumed to be normally distributed.

\(^1\) For detailed discussion see, Pedroni, 2001.
The determinants of labour productivity across the Indian states have been identified and the specified equation has estimated using fixed and random effect model. In order to test for convergence of labour productivity across the Indian states, we have estimated the well-known β convergence coefficient from the following regression.

\[
\ln\left(\frac{y_i}{y_{i,t-1}}\right) = a - (1 - e^{-\beta}) \ln(y_{i,t-1}) + u_i \quad (1.3)
\]

Where the subscript t denotes the years, and the subscript i denotes the state. The theory implies that the intercept, \( a \), equals \( x + (1 - e^{-\beta}) \cdot \ln(\hat{y}_i^*) + x_i \cdot (t - 1) \), where \( \hat{y}_i^* \) is the steady state level of \( y_i \). The coefficient \( \beta \) represents the rate of convergence, \( T \) is the length of the observation and \( u_i \) is the error term. To measure the dispersion in labour productivity across industries, the coefficient variation of the log of labour productivity, \( \sigma \), has been estimated across the states over the period of time.

We have also examined the convergence of labour productivity by using pooled regression analysis, dynamic panel model and panel unit root test. To investigate the robustness results, we present the dynamic panel data model, which are estimated using Arellano and Bond (1991) GMM estimation procedure, bearing in mind again the cautions of using dynamic panel estimator in macroeconomic studies where typically the N dimension is short.

Consider the linear dynamic panel data specification given by:

\[
\ln Y_{it} = \sum_{j=1}^{p} \rho_j \ln Y_{it-j} + \ln X_i' \beta + \mu_i + \varepsilon_{it} \quad (1.4)
\]

Where \( x_i' \) is \( 1 \times k \) and \( \beta \) is \( k \times 1 \). \( i = 1 \ldots N; \ t = 1 \ldots T \). The equation (1.4) may be estimated using GMM techniques.

The panel unit root test consider the following model:

\[
y_{it} = \rho_i y_{i,t-1} + z_{it} + u_{it}, \ i = 1, \ldots, N; \ t = 1, \ldots, T. \quad (1.5)
\]

Where, \( z_{it} \) is the deterministic component and \( u_{it} \) is a stationary process. The \( z_{it} \) could be zero, one, or the fixed effect \( \mu_i \). The Levin-Lin tests assume that \( u_{it} \) are iid(0, \( \sigma^2 \mu \)) and \( p_i = p \) for all \( i \).

\[4\] Taken from Barro and Martin, 1995, pp.384.
1.7. Relevance of the Study

The relevance of the study stems from four important factors. First, even though there exist studies exploring the links between economic reforms and total factor productivity growth in Indian manufacturing, the issue of labour productivity growth, the only route to enhance labour welfare in the long run has not been examined exhaustively. Secondly, the issue of growth of wages termed as the hindrance for employment growth in the eighties has not been examined in relation to productivity growth. Studying wages in isolation could provide an erroneous view as reported in some of the earlier studies. Attempts to link wages and productivity are conspicuous by their absence in the Indian context. Thirdly, important information on the state level variations in labour costs and productivity hardly exists in the Indian context. While there exist some information on wages in the agricultural sector at state level, the present study gives some insight about the manufacturing sector. Fourthly, an analysis of the trade-offs between employment and productivity growth, and between wages and productivity growth needs to look beyond the short run to a longer-term horizon in which industries have adequate time to adjust to the demand requirements of the economy. Even if higher labour productivity leads to job displacement in some of the industries in short run, in long run it can lead to a higher real income, which could cause shifts in product demand and thus result in employment creation. This is very important from a policy point of view.

1.8. Scope of the Study

The study of wage structure and productivity analysis is confined to the registered manufacturing sector in India. In case of inter-industry analysis, the study is limited to 17 two-digit disaggregate of the registered manufacturing sector of our economy. It is an empirical study based on both cross section as well as time series data. The study broadly covers a period from 1973-74 to 2001-02 for aggregate industry analysis, but for some of the objectives it limits to period 1999-2000 because of the inconsistency of data in the last two years. Similarly, for inter-state analysis, the study covers the period from 1979-80 to 2000-01. The labour productivity is measured as the ratio of real gross value added to number of employees or workers. But the better measurement would have been real
gross output or value added by number of man-hours. This study could not attempt the
second definition due to unavailability of man-hours data in case of Indian
manufacturing. The state level analysis has been carried out for 15 major states of Andhra
Pradesh, Assam, Bihar (undivided), Gujarat, Haryana, Karnataka, Kerala, Madhya
Pradesh (undivided), Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh
(undivided) and West Bengal. The selection of these states is justified on the grounds that
they together accounted for 95.5 per cent of the total value added by India's registered
manufacturing sector in 1995-98 (see, Thomas J, 2002). The determinants of labour
productivity across the states have been restricted to only quantitative variables. There
are also some qualitative variables, which affect the labour productivity but not taken into
account in this study. Finally, in case of convergence analysis, we have assumed that
labour productivity is the per capita output. Multifactor Productivity would have been a
better measure for per capita output. But due to lack of relevant data for construction of
the weights of various inputs for all the states, it is difficult to measure the Multifactor
Productivity.

1.9. Data Description, Sources and Period of the Study

The present study has two dimensions of analysis viz., at inter-industry level and
at the inter-state level for aggregate manufacturing. For inter-industry level analysis, the
aggregate Indian economy is taken as the unit and 17 two-digit industries belong to the
unit. The industries included in the analysis are 20-21 Food Products, 22-Beverages, 23-
Cotton, 24-Woolen, 25-Jute, 26-Textiles, 27-Wood, 28-Paper, 29-Leather, 30-Chemical,
31-Rubber, Petroleum, and Coal, 32-Non-metallic Minerals, 33-Basic Metals, 34-Metal
Products, 35-36 Machinery, 37-Transport and Parts, 38-Other Manufacturing. For inter­
state analysis, the total manufacturing sector is taken as the unit and 15 major states
mentioned in previous section are taken into account. The data on output, value added,
employees, workers, skilled workers, wages, capital, investment and prices are
considered for the analysis. The variables are measured correctly and the measurement
procedures are briefly elaborated in the respective chapters of the study. The nominal
values of the relevant variables are deflated using suitable price indices, in order to get
real values of the variables. The price indices are converted to a single base year and thus, homogeneity is maintained.

For inter-industry analysis, the study period is chosen from 1973-74 to 2001-02. But, for some of the objectives within the inter-industry analysis, the study period is chosen from 1979-80 to 1999-2000. This is because of unavailability and inconsistency of some data. Similarly, in order to investigate the long run relationship between labour productivity, wages, employment and prices for aggregate manufacturing, the study uses annual data from 1960-61 to 2001-02. However, for inter-state analysis, the period is chosen from 1979-80 to 2001-02. Besides this, the study period also has been divided into two sub-periods: (i) pre-liberalization period (1973-74 to 1991-92); (ii) intensive-liberalization period (1992-93 to 2001-02) for total manufacturing and 1992-93 to 1999-00 for two-digit disaggregate level. This is done in order to evaluate the impact of industrial liberalization on growth of labour productivity and wages, which was initiated in July 1991.

The data are mainly collected from Annual Survey of Industries (ASI published by the Central Statistical Organization). The ASI considers only registered manufacturing sectors. The coverage of the Annual Survey of Industries limits to the industrial units (called factories) registered under the section 2m(i) and 2m(ii) of the Factories Act. 1948. The data are generally quantitative in nature, which cover the economic characteristics of the industries. But, it does not encompass the social dimensions like workers educations, age structure, gender wise wages etc. Moreover, ASI does not provide the data on export, import, FDI flows etc. at the two-digit disaggregate level of Indian manufacturing sector. The data on manufacturing sector are also available in different rounds of National Sample Survey Organization (NSSO). The NSS reports broadly cover the data on both organized as well as unorganized manufacturing sector. But the NSS surveys on manufacturing sector are conducted once in every five years. Thus, these data do not cater to the objectives of the present study, which require continuous time series data. The ASI’s classification of industries at the two-digit level rests on the National Industrial Classification (NIC). Until 1997-98, the ASI data was organized according to
the NIC 1987 classification, since then the NIC 1998 classification has been followed. To arrive at a consistent data set at the two-digit level, we have used a concordance table published by the CSO to reclassify the data for the years 1998-99 to 2001-02 according to NIC 1987 code. The cotton textiles (23) + woolen textiles (24) + jute textiles (25) of 1987 NIC classification, became one aggregate industry code (171) in NIC 1998 classification. So in order to bring last four years data into old NIC 1987 classification, we segregate the 171 code data of NIC 1998 classification.

The data on Wholesale Price Index (WPI) have been collected from Handbook of Statistics on Indian Economy. The city-wise data on Consumer Price Index (CPI) of industrial workers are available in various issues of RBI bulletin and Bulletin of Food Statistics. There is no specific Consumer Price Index of industrial workers at the state level. So, one general price index number has been calculated by taking the average of all available CPI of industrial workers across the cities for a particular state.

1.10. Chapter Scheme of the Study

The present study is organized in eight chapters. The first chapter explains the background of the study and the statement of problem. This chapter also outlines the major researchable issues, objectives, analytical tools, relevance of the study, scope of the study and the database. In order to identify the research gaps of the study, review of existing literature has been carried out and placed in the second chapter. The third chapter highlights the inter-industry comparison of wage structure and labour productivity analysis. An inter-industry analysis of Total Factor Productivity Growth is carried out in chapter four. This will help us to decompose the TFP growth into Technological Progress (TP) and changes in Technical Efficiency (TEC) within the framework of the time varying coefficients frontier production function. The fifth chapter discusses the nexus between labour productivity, employment and wages in case of aggregate and two-digit disaggregate levels of Indian manufacturing sector. It will provide us the specific issue of employment and wage trade-offs with productivity growth in long run. The analysis of the inter-state industrial disparities and determinants of labour productivity is explained
in chapter six. The productivity convergence in manufacturing sector across Indian states is presented in chapter seven and all the major findings and policy suggestions are furnished in the last chapter.