Chapter I
Introduction
1.1 The Context

The role of manufacturing sector in economic expansion in terms of generation of value added, employment, income, and foreign exchange earnings are very well known. Specially, the manufacturing segment in the industrial sector in termed as growth engine in the development process. In the era of globalization and liberalization, the development of manufacturing industry is crucial for a country to achieve a larger share in the global market. India has implemented various policies of economic openness and outward-orientation during early 1990s, which led to the rise of India’s volume of trade significantly. The share of merchandise trade (i.e. exports and imports) in GDP of India augmented from just 14 to 44 percent in 1990-91 to 2011-12. While the ratio of total trade viz., exports and imports of goods and services to GDP increased from 17 to 56 percent between these years (Rangarajan and Mishra, 2013).

In this background, the growing role of international trade in national GDP and manufacturing sector, its influence on output, productivity and employment needs to be examined. Specifically, India which is intending to create 100 million manufacturing jobs in the next 10-15 years, the understanding the role of trade in employment creation and wage rate has immense policy implications (National Manufacturing Policy, 2011).

In the literature, the trade impact on employment depends on the nature of industry such as import competing or export oriented industries. Even in the case of export oriented industries that are known for employment creation, concerns on poor working conditions in the productive units organized under global value chains have been expressed (Ghose, 2000). Notwithstanding the growing role of trade in Indian economy and its potential role in shaping labour market outcomes, this issue continues to be less explored and analysed in the context of Indian manufacturing. It is argued that, the growth of foreign trade has certainly some unfavourable impact on employment in unskilled labour-intensive manufacturing industries of developing countries (Goldar, 2002; Pradhan, 2006).

In this connection, the Indian manufacturing sector plays a significant role in growing the industrial growth of the economy. Besides contributing one-fourth share in the Gross Domestic Product (GDP), this sector is accounts for 11.4 percent share of employment in entire industrial sector. Further, approximately 52.4 million persons are employed in
this sector, of which 40.61 and 11.79 million workers are working in the unorganised and the organised segment respectively (Economic Survey, 2011-12).

The central motivation of this study lies in exploring the effects of international trade on labour outcomes in the Indian manufacturing sector. It argues that although the manufacturing sector promotes export capacity, the manufacturing workers are lagging behind in terms of wage rates and employment condition. The issues of employment opportunities and level of wage rate are important because of different types of workers, e.g. men-women, skilled-unskilled and regular-contractual workers. A high level of job insecurity, poor working conditions, low wages and vulnerability to exploitation characterise women, unskilled and contractual workers and hence it is necessary to understand and analyse the role of international trade in outcomes for different categories of workers (Pradhan, 2006).

1.2 Review of Literature

This section discusses about the national and international level studies on empirical findings, results and summaries on the effects of trade on employment and wages.

The table: 1.1 presents that impact of trade liberalisation on Chilean firms in the import competing and export oriented were relatively similar. Results from the analysis of firm level data and OLS regression methods find that the effects of trade openness caused an 8 percent dropped in net employment in the manufacturing during the period between 1979 and 1986 (Levinsohn, 1999).

Ghose (2000) analysis carried out during the period 1981 to 1994 using Heckscher-Ohlin (HO) model, shows that the growth of trade between the manufacturing sector in developing and developed countries has decreased real wage rates and unskilled workers and also point out that increase wage inequity and reduce elasticity of employment. Interestingly, it finds that employment share in export oriented industries actually has been declining in the Indian manufacturing. Similarly, In a study conducted by Mesquita and Najberg (2000) used a growth accounting method, factor content approach and regression techniques, it was found that employment decline in capital intensive and labour intensive manufacturing industries during the trade liberalisation period, 1990-1997 in Brazil.

Sen (2008) study the impact of foreign trade on employment in Indian manufacturing, a comparison with four developing countries, two countries from Africa and two in from
Asia regions. On the basis of the factor content approach and HO model, the study obtained that the employment coefficients of exports and imports in Indian manufacturing have constantly dropped over the period. Furthermore, it has found that changes of employment coefficient of exports and imports narrowed during the period 1974-1998.

Results from the analysis of probit regression in a study suggest that there are less impact of trade-related variables (imports, exports and off-shoring variables) on the level of wages during the period 1999-2007 in Germany (Gorg and Gorlich, 2011). Moreover, it finds that an intensification in export intensity is related with a higher unemployment risk for workers on contracts workers and also indicates imperative changes between manufacturing sector and services sectors in specifically with respect to exporting and offshoring.

The tables 1.2 and 1.3 explain the findings and summaries on the effects of international trade on employment and also literature on Indian manufacturing employment and wage rate. Goldar (2002) findings from the analysis of HO model, cross section and time series suggest that growth of employment was 1.6 percent and this increased to 3.1 percent per annum in the period 1973-74 to 1989-90 and 1990-91 to 1997-98. Findings on trends in real wages shows that, there was a substantial slowdown of growth in real wages. Furthermore, there is a positive impact of trade liberalisation on employment of manufacturing in developing countries. Banga (2005) using Constant Elasticity of Substitution production functions and generalised method of moments, found that export-orientation has statistically significant positive effects on level of employment. According to Pradhan (2006), outcomes from the analysis of the Ordinary Least Square (OLS) suggest that the impact of technology, foreign technology imports, R&D and capital intensity has been negative effects for women patterns and unskilled patterns but positive for contract employment patterns. Moreover, the study finds that foreign direct investment with its skill-biased technology change, have a negative role in the contract and low skilled in Indian manufacturing during the period 1995-96 to 2001-02.

Goldar’s (2000) study, by the analysis of regression method, shows that employment in the organised Indian manufacturing i.e. including electricity recorded an annual average growth rates 2.83 percent during 1990-96. The empirical study suggests that, growth was mainly contributed by private and joint sector. The growth rate recorded by the public sector (0.39 percent) was as besides 3.72 percent in case of other firms.
Nagaraj (2004) study present that approximately 1.1 million of workers in organised Indian manufacturing destroyed their jobs between 1995-96 and 2000-01. A study conducted by Rani and Unni (2004) has analysed the effect of economic reforms on the organised and unorganised Indian manufacturing. The analysis indicated that, economic reform policies had a differential impact on various industry groups viz. a clearly growth drop in both the sectors i.e. capital intensity and labour intensity.

Table No: 1.1
Empirical Results on the Effects of International Trade on Employment and Wage Rates

<table>
<thead>
<tr>
<th>Authors</th>
<th>Study Period and Country</th>
<th>Methodology</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghose, (2000)</td>
<td>1981-1994 Developing Countries and India</td>
<td>3 digits 4-digit level of classification. utilised Heckscher-Ohlin model</td>
<td>The study finds that international trade rises employment elasticity in manufacturing industries. However, the share of employment in export oriented industries has been deteriorate in Indian manufacturing.</td>
</tr>
<tr>
<td>Mesquita and Najberg, (2000)</td>
<td>1990-1997 Brazil</td>
<td>Growth accounting method and factor content approach, regression techniques</td>
<td>This study finds an employment decline in capital-intensive (32.4 percent) and labour-intensive (13.3 percent) industries.</td>
</tr>
<tr>
<td>Sen, (2008)</td>
<td>1974-98 India in Comparison with</td>
<td>Based on ASI database. Factor content approach,</td>
<td>Study finds that the employment coefficients of exports and imports in Indian manufacturing have constantly</td>
</tr>
</tbody>
</table>
Bangladesh, Kenya, South Africa and Vietnam

Heckscher-Ohlin model

dropped over the period. Furthermore, it has found that changes of employment coefficient of exports and imports narrowed during the period 1974-1998.

Gorg, Holger and Dennis Gorlich, (2011)

1999-2007 Germany

Probit regression analysis

Study shows that there is slight (neither positive nor negative) effects of trade openness variables i.e. exports, imports and offshoring on level of wage rates. Furthermore, results indicates that a growth in export intensity is related to higher unemployment hazard for contractual workers.

Blanas, (2012)

1995-2005 United States

OLS method

The study finds demand for low-skilled labour is negatively affected with intra-firm imports, while unaffected by intra-firm exports.

Source: Compiled by Author

Table No: 1.2
Summary of Empirical Findings on Trade on Employment in India

<table>
<thead>
<tr>
<th>Author</th>
<th>Study Period</th>
<th>Methodology</th>
<th>Main Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goldar, (2002)</td>
<td>1974-1998</td>
<td>Heckscher-Ohlin model, cross sections and time series analysis at 3-Digit level</td>
<td>The study finds a positive impact of trade liberalisation on employment of manufacturing in developing countries. It is also shows that trade openness leads to sinking wage disparity, as the wage gap between the skilled and unskilled workers gets narrowed.</td>
</tr>
<tr>
<td>Studies</td>
<td>Issues Examined/Findings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chaudhuri, (2002)</td>
<td>Study indicates that labour intensity had gradually gone down from 0.78 to 0.56 in 1990-91 to 1997-98.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banga, (2005)</td>
<td>Study finds that export orientation of manufacturing industries has significant favourable impact on employment in Indian manufacturing.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pradhan, (2006)</td>
<td>Trade has been promoting employment for women and unskilled workers. Impact of technology, foreign technology imports, R&amp;D expenditure and capital intensity has been negative effects for women patterns and unskilled patterns but positive for contract employment patterns.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kannan, (1994)</td>
<td>The study demonstrates that growth of product wages was lower than labour productivity during 1973 to 1988 in organised Indian manufacturing, while the variance got reduced.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goldar, (2000)</td>
<td>Shows that employment in the organised Indian manufacturing i.e. including electricity recorded an annual average growth rates 2.83 percent during 1990-96. The empirical study suggests that, growth was mainly contributed by private and joint sector. The growth rate recorded by the public sector (0.39 percent) was as besides 3.72 percent in case of other firms.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Rani and Unni, (2004) The analysis indicated that, economic reform policies had a differential impact on various industry groups viz. a clearly growth drop in both the sectors i.e. capital intensity and labour intensity.


| Source: Compiled by Author |

1.3 Research Gaps and Issues

The above review of literature throws up a number of research issues and gaps. There are hardly any studies that have explored the impact of trade openness on employment and wage rates in the Indian manufacturing with organised and unorganised sectors under consideration (Ghose, 2000; Goldar, 2000; 2002; Nagaraj, 2004; Banga, 2005). In this backdrop, present study differs from the previous studies in several ways and enhances the existing literature.

First, it uses the combined value added data of organised and un-organised sector in classifying industries into different trading groups. Hitherto, the trade classification of manufacturing industries based on export-orientation is based on organised segment alone. Second, it proceeds further from descriptive analysis of comparing growth trends of employment and wage rate between export-oriented, import competing industries groups to use the estimation to explain the impact of exports and imports on objective variables. Thirdly, it recognises the heterogeneity of workers.

Research indicates that, import competing industries shown a decline in employment elasticity in the post reform period. As workers are essentially heterogeneous, impacts of trade may differ between different groups of workers like, women versus men, unskilled versus skilled and contractual versus regular workers. It leads to a rise of wage disparity in the India’s manufacturing sector (Goldar, 2002). It was found that the wage rates gap between the skilled workers and unskilled workers got widened. Growth of real wages has reduced substantially. It also finds that in the organised and unorganised manufacturing sector, the gap between men- women, skilled-unskilled and regular-contractual workers have escalated. The present study utilizes Heckscher-Ohlin-Stolper-Samuelsson theorems in Indian manufacturing in terms of the level of employment and wage rate, and would fill up theoretical research gap.
1.4 Theoretical Framework and Hypothesis Formulation

The existing theories of trade openness illuminate how international trade upsets labour market outcomes in developing and developed countries. Over the last few decades, in the age of globalisation, the growing wage inequality between skilled-unskilled, men-women and regular-contractual labour has been a worldwide phenomenon. The growing literature on international trade theories with H-O-S would be relevant for understanding the trade and labour market outcomes.

According to theory of HOS, the main determinants of the pattern of production and trade among regions are the comparative availability of factor endowments and factor prices (Jhingan, 2009). This suggests that some countries have much larger capital abundance, whereas others have much larger labour abundance. Hence, the countries that are rich in capital will export capital-intensive goods and countries that are rich in labour will export labour-intensive goods. Furthermore, Stolper-Samuelson theorem (1941), proposes that an increase in the price of the labour-intensive product causes an increase in the real-wage rate and a reduction in the return to capital. The theorem indicates how wages change as international prices change (Learmer, 1995).

According to the strategic trade theory, the policy for certain countries affects the outcomes of strategic interaction between firms in an international oligopoly, an industry dominated by a small number of firms. Attention is drawn to new developments in trade theory with strategic trade providing inputs to industrial policy. The issues relating to trade, employment, growth and development are dealt with separately (Sen, 2005). This approach states that strategic trade policies raise the level of domestic welfare in a given state by shifting profits from foreign to domestic firms. The term strategic use of export subsidies, import tariff and subsidies to R&D or investment for firms facing global competition may have strategic effects of their development in the international market (Brander and Spencer, 1981).

The following hypotheses are formulated on the basis of existing theories:

**H1:** International trade influences the level of employment and wage rate in the manufacturing sector.

A conclusion based on H-O-S model which argued that there is a rise in impact of increased competition and trade on employment and wage rate. It can be argued that the international trade leads to reallocation of employment from import competing towards
the export oriented sector in India (Sankaran, Abraham and Joseph, 2010). Basically, Indian exports mainly consist of labour intensive products which produce more employment opportunities for women because women work for low wages causing in poor working conditions (Kakarlapudi, 2010). In a study conducted by Bussolo et al. (2002) analyses on the basis of the theory of HOS namely comparative advantage suggests that trade openness leads to a redistribution of resources to production concentration in those sectors that use intensively the country’s maximum abundant factor. Furthermore, it suggested that, this theory expects output changes towards low skill labour intensive goods, augmented demand for unskilled workers and upward variations in their wage relative to the other factor rewards in developing countries. Also theory of heterogeneous firms and international trade led by Melitz and Redding (2012) has begun to explore the implications of labour market frictions for the impact of trade liberalisation on the distribution of income across workers.

**H2:** As international trade is expected to generate more employment opportunities in export oriented industries but lowering those in import-competing industries, the nature of overall employment outcome is ambiguous.

The literature uses a variety of econometric methods. Earlier studies focused on how trade changes labour outcomes via the theories of international trade (Ghose, 2000; Goldar, 2002; Banga, 2005). They typically ran regression which linked the level of employment and trade flows. Many of these works deal with estimation derived from a regression analysis of H-O-S model. The majority of these studies concludes that skilled-biased technological change was the main source of increased wage inequality between the men-women, regular-contractual and skilled-unskilled workers. According to Ghose and Pradhan, the impact of international trade on employment of various workers may be either positive or negative. Because trade includes negative and positive outcomes, nature of trade impact on women, contractual, unskilled workers (Ghose, 2000; Pradhan, 2006).

**H3:** The destination of Indian exports (developed versus developing countries) or the source of imports (developed versus developing region) may have differential labour outcomes in Indian manufacturing.

According to theory of HOS literature, there is virtual consensus that two-way trade in manufactures between the developed countries and developing countries has been
growing; the destination of India’s trade between developed or developing countries may have differential labour outcomes in Indian context. Developed countries market are sophisticated and differentiated, so India could be exporting highly differentiated and skilled products to them. Explain on nature of demand, market competition in developed and developing region to expose this hypothesis.

The evidence from existing literature suggests that, low skilled workforces in the developed countries have been facing both decreasing real wages and increasing unemployment (Ghose, 2000). A study conducted by Blanas that used the theory of intra-industry trade using theoretical, empirical evidence and econometric analysis, discusses the effects of intra-firm imports and exports have on manufacturing-wide domestic employment. It finds that Intra-firm imports have negative effects on the employment level of low-skilled worker while it was found to be unaffected by intra-firm exports. It is also evidences that it were high-skilled workers who benefited from intra-firm exports in terms of their employment level during the period 1995-2005 in United States manufacturing (Blanas, 2012).

The existing available facts and discussions observe that, the evaluation of H-O-S has impacted on policy. The traditional trade theory in the form of Heckscher-Ohlin-Samuelson continues to be used to justify trade liberalisation or impact of trade on developing countries in spite of the serious theoretical and empirical limitation embedded in these theories. The present study develops the idea that H-O-S theorem, theory of heterogeneous firms, and international trade and strategic trade theory are empirically useful in terms of description of reality and play a key role in understanding important aspects of international trade and labour outcomes in manufacturing in the Indian context.

1.5 Research Questions

1.5.1 What are the employment and wage rate trends across Indian manufacturing industries classified based on trade orientation?

1.5.2 What are the trends and patterns of different types of employment such as men-women, regular-contract and skilled and unskilled workers in Indian manufacturing industries based on trade orientation of industries?

1.5.3 What are the trends and patterns of level of wages and wage rate of types different workers like men-women, regular-contract and skilled-unskilled
workers in Indian manufacturing industries based on trade orientation of industries?

1.5.4 How do trade (i.e. export intensity and import intensity) affects level of employment and wages in the Indian manufacturing sector?

1.5.5 Does the geographical origin of imports or destinations of exports matter for employment and wage outcomes in Indian manufacturing industries?

1.6 Research Objectives

This study intends to look into the following research objectives:

1.6.1 To analyse trends and patterns of the level of employment across different categories of workers like men-women, regular-contract and skilled and unskilled workers in Indian manufacturing industries, which are in turn classified into different groups based on trade orientation of industries.

1.6.2 To examine trends and patterns of wage rate across different categories of workers covering men-women, regular-contract and skilled-unskilled workers in different groups of classified based on trade orientation.

1.6.3 To understand the impact of trade flows, both exports and imports on the level of employment and wage rate in Indian manufacturing sector.

1.6.4 To investigate possible differential labour market impacts that imports into India can have depending on source of their origin (i.e., developed or developing region) and similarly in the case of imports by destination region.

1.7 Methodology of Analysis

The present empirical and analytical study will be based on various data sources like Annual Survey of Industries (ASI), National Sample Survey Organisation (NSSO), Export-Import databank by DGCI&S and UN-COMTRADE. This study will be an attempt to explain the trends and patterns of level of employment and wage rate in three-digit industries of organised and unorganised sector by applying panel data analysis. It will utilize quantitative data for this analysis.

The required data will be collected from various reliable sources. For this analysis, it utilizes a combination of organised and unorganised Indian manufacturing data taken
from *Annual Survey of Industries* and unit level of NSSO respectively. This study draws a different NSSO rounds i.e. 51st (1994-1995), 56th (2000-2001) and 62nd (2005-2006) covering the period of 1990-2006. It is used to compare organised and unorganised sector which is consistent. It also draws annual data of three-digit industry level. The limitation of using the employment data, is that the definition of workers in ASI differs from that adopted for the NSSO survey on unorganized manufacturing (for instance, part time workers may be included in unorganized manufacturing) and this may have affected the results of the analysis.

To determine the wage gaps between male and female, skilled and unskilled, regular and contract workers in the Indian manufacturing, the wage rate related datasets will be collected from Labour Bureau. Data is accessible on the number of workers, total person engaged, total emoluments of employees and wages paid to them.

This study will utilize trade i.e., exports and imports related data such as UN-COMTRADE provided by UNCTAD. These trade datasets is mapped into individual industries according to the ISIC Rev3, which is reliable with NIC-1998 classification. The present study is limited to the analysis from 1990-2011 the latest year up to which ASI and NSSO data are available when the study was started.

Furthermore, this study will collect trade related data from the Director General of Commercial Intelligence and Statistics (DGCI &S) by Director General of Foreign Trade (DGFT), various years of Economic Survey Reports, World Bank report and other relevant sources. Reports on Organised and Unorganised sector etc., and appropriate statistical tools and techniques will be used for the analysis. After the collection, the data will be compiled and the analysis will be done using panel analysis and STATA software.

### 1.8 Empirical Framework

In this section the study proposes an empirical model which describes the variables which will be used to estimate the effects of trade openness and other industry related factors on level of employment and wage rates in India’s manufacturing sector (Nagaraj, 1994; Goldar, 2000; Banga, 2005; Sen, 2008; Sankaran, Abraham and Joseph, 2010; Pradhan, 2006 and 2011). As for the empirical model, the panel data model will be used to analyse the testing the hypothesis.
\[ EMP_{it} = \alpha + \beta_1 NVA_{it} + \beta_2 RDIN_{it} + \beta_3 EXP_{it} + \beta_4 IMP_{it} + \beta_5 FDI_{it} + \beta_6 K/L_{it} + \beta_7 WAGE_{it} + \beta_8 IWT_{it} + \mu_i + \epsilon_{it} \] 

\[ WAGE_{it} = \alpha + \beta_1 NVA_{it} + \beta_2 RDIN_{it} + \beta_3 EXP_{it} + \beta_4 IMP_{it} + \beta_5 FDI_{it} + \beta_6 K/L_{it} + \beta_7 IWT_{it} + \mu_i + \epsilon_{it} \] 

**Table 1.4**

**Description of Explanatory Variables**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Symbols</th>
<th>Measurements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variable</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td>EMP_{it}</td>
<td>Total Workers Engaged (Natural log)</td>
</tr>
<tr>
<td><strong>Independent Variables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Value Added</td>
<td>NVA_{it}</td>
<td>Natural log of the NVA of industry in ( i )th manufacturing industry in ( t )th year</td>
</tr>
<tr>
<td>R&amp;D intensity</td>
<td>RDIN_{it}</td>
<td>R&amp;D expenses of the ( i )th industry as a percentage of its value-added in the ( t )th year</td>
</tr>
<tr>
<td>Export</td>
<td>EXP_{it}</td>
<td>Natural log of exports of the ( i )th manufacturing industry in the year ( t )</td>
</tr>
<tr>
<td>Import</td>
<td>IMP_{it}</td>
<td>Natural log of imports of products belong to ( i )th manufacturing industry in the year ( t )</td>
</tr>
<tr>
<td>Foreign Direct Investment</td>
<td>FDI_{it}</td>
<td>Ratio of cumulative FDI flows since 1990-91 received by ( i )th industry as a percentage of industry value added in the ( t )th year.</td>
</tr>
<tr>
<td>Capital Intensity</td>
<td>K/L_{it}</td>
<td>Ratio of fixed capital to the total workers engaged for the ( i )th manufacturing industry in the year ( t ).</td>
</tr>
<tr>
<td>Wage Rate</td>
<td>WAGE_{it}</td>
<td>Per worker real wages in ( i )th manufacturing industry in ( t )th year</td>
</tr>
<tr>
<td>Import Weighted Tariff</td>
<td>IWT_{it}</td>
<td>Ratio of total tariff rates to total value of imports</td>
</tr>
</tbody>
</table>

The log of employment is taken as the dependent variables although other variables specified above are taken as explanatory variables. Further \( \alpha \) is intercept and \( \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6 \) and \( \beta_7 \) are the parameters of the equation that linkage together the dependent and explanatory variables, \( i \) and \( \mu \) denotes industries dummy \( u_{it} = \) residuals for all \( i = 1,2,...,n \) and \( t = 1,2,...,n \) where \( i \) and \( t \) signifies industry and time respectively. In the above equation the natural log values of variables are used to transform it into a linear equation.
Table 1.5
Description of Explanatory Variables

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</tr>
</thead>
<tbody>
<tr>
<td>Dependent Variable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wages</td>
<td>WAGE\textsubscript{it}</td>
<td>Ratio of total wages to total employment (log)</td>
</tr>
<tr>
<td>Independent Variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net Value Added</td>
<td>NVA\textsubscript{it}</td>
<td>Natural log of the NVA of industry in \textit{i}th manufacturing industry in \textit{t}h year</td>
</tr>
<tr>
<td>R&amp;D intensity</td>
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</tr>
<tr>
<td>Capital Intensity</td>
<td>K/L\textsubscript{it}</td>
<td>Ratio of fixed capital to the total workers engaged for the \textit{i}th manufacturing industry in the year \textit{t}.</td>
</tr>
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<td>Ratio of total tariff rates to total value of imports</td>
</tr>
</tbody>
</table>

The log of wage rates is taken as the dependent variables although other variables specified above are taken as explanatory variables. Further $\alpha$ is intercept and $\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$, $\beta_5$, $\beta_6$ and $\beta_7$ are the parameters of the equation that linkage together the dependent and explanatory variables, $i$ and $\mu_i$ denotes industries dummy $u_{it} = \text{residuals for all } i = 1,2\ldots n$ and $t = 1,2\ldots n$ where $i$ and $t$ signifies industry and time respectively. In the above equation the natural log values of variables are used to transform it into a linear equation.

1.9 Significance of the Study

Although a significant issue, there are a few empirical studies which directly analyse International trade and labour market outcomes in Indian manufacturing. This study focuses on industry level analysis to understand the trends and patterns of Indian manufacturing employment and wage rate. An attempt will be made to directly relate labour market variables with trade policy measures. This study aims at providing a better understanding of the impact of international trade on level of employment and wage rates which is crucial for the implementation of a sound policy related to manufacturing.
employment and workers benefits. This study explores the possibility that the generally
performance of the Indian manufacturing exhibits significant inter-industry
heterogeneity. It will be useful for policy makers, academicians, researcher, planners,
trade union leaders and entrepreneurs interested in the development of the Indian
manufacturing sector.

1.10 Chapter Plan

The present study is organised into five chapters.

Chapter 2 Trade Orientation of Industries and Employment Performance

The chapter starts with a review of trade orientation of industries and employment
performance related literature and analyses inter-industries composition in Indian
manufacturing employment. It also reviews theories of international trade and labour
and proposes a multidimensional eclectic conceptual framework. This chapter as
specially disaggregates statistics for both organised and unorganised Indian
manufacturing in term of NIC-1998 at three digit level. Furthermore, it identifies and
groups of industries into export oriented, import competing, export oriented-import
competing and low trade dependent industries. It reviews existing literature to justify
criteria of identification of industries. For this, it uses the measure of trade openness to
identify trade orientation of industries. It focuses on the employment trends and patterns
of Indian manufacturing sector during 1990-2011. Furthermore, it also deals with
changing patterns of different types of employment i.e. men-women, skill-unskilled, and
regular-contract workers based on export oriented and import competing industries. In
addition, it emphasizes on estimation of employment elasticity and labour productivity.

Chapter 3 Determinants of Employment

In this chapter, analysis of employment determining factors among Indian
manufacturing industries is conducted. It undertakes a brief review of determinants of
employment in manufacturing and proposes an empirical model to estimate the effects
of international trade and other important factors on employment in India’s
manufacturing during the period of 1990-2011. As for the empirical model, the panel
data analysis is used to analyse the hypothesis.

Chapter 4 Trade and Wages: Trends, Patterns and Determinants
This chapter provides a brief review of literature on trade and wage and investigates into the trends and of patterns wage rate based on grouping like export oriented, import competing, export oriented-import competing and low trade dependent industries. It also examines the wage rate of different types of workers as men-women, skill-unskilled, and regular-contract. In addition, it focuses on developing an analytical framework and estimating the relation between the trade openness variables and the wage rate in Indian manufacturing since the 1990s.

**Chapter 5 Conclusion, Suggestion and Further Research**

This chapter concludes the study by providing a summary of the main findings and policy implications.