Trade Liberalization and Unemployment in India: A State Level Analysis

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TRADE LIBERALIZATION AND UNEMPLOYMENT IN INDIA: A STATE LEVEL ANALYSIS

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Abstract

The study empirically examines the relationship between trade liberalization and unemployment for the Indian economy using data for Indian states (separately for rural and urban areas). This study provides support to the argument that effects of trade liberalization have been different for the states in India. The results find evidence for the negative relationship unemployment and trade openness. The relationship is significant for rural parts of the states which also drive results for the total state; though for urban part of the states, relationship is not found to be significant. The results also indicate that this effect is higher and stronger for more flexible states. The results hence, confirm to the theory that in developing countries trade openness leads to increase in the employment of labour; but more so of unskilled workers and leads to a movement away from the agriculture and hence rural sector of the economy. This is substantiated by internal migration trends for India which showed an increase in population mobility during post reform period. The data also corroborated the shift from rural agricultural to rural non-agricultural and urban sectors of the economy.

Keywords: Trade Liberalization, Unemployment, Labour market institutions, Panel data

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I INTRODUCTION

The world economy is experiencing a decline in employment to population ratio for most of its regions and hence unemployment problem is drawing attention of international research and policy design. The economies today are also unarguably global in nature. In the last half decade, the world trade as a proportion of world gross domestic product (GDP) approximately doubled (World Bank Group and World Trade Organization, 2015). Does this process of globalization, especially liberalization of trade, reduce unemployment? The relationship between trade liberalization and unemployment was historically studied using the Hecksher-Ohlin (HO) and Stolper-Samuelson (SS) theorems. The HO theorem, predicts that countries export goods produced with the intensive use of the factors which are in abundant supply. Thus, developing countries, like India, would export more labour intensive goods, thereby increasing the demand for labour to produce those goods.

Most of the trade models assume full employment of labour and all factors at all times and hence, do not recognise any impact of trade on employment. The four theories of employment have been incorporated in the traditional models (HO and Ricardo-Viner) with labour frictions of various kinds: minimum wage theory (Brecher, 1974 and Davis, 1998), implicit contract theory (Matusz, 1986), efficiency wage theory (Matusz, 1996) and job search theory (Davidson, Martin & Matusz, 1999 and Moore & Ranjan, 2005). The recent theoretical developments introduced two new types of trade models - heterogeneity of firms (Helpman & Itskhoki, 2010; Helpman, Itskhoki & Redding, 2010; Egger & Kreickemeier, 2009) and offshoring or trade in tasks (Batra & Beladi, 2010; Mitra & Ranjan, 2010; Ranjan (2012 & 2013). The studies have found conflicting, complex and ambiguous relationship between trade and aggregate employment, leading to an empirical assessment of whether and how trade affects the level of equilibrium employment (Davidson & Matusz, 2004).

The aim of this study is to empirically analyse the relationship between trade openness and unemployment for the Indian economy using data for Indian states (separately for rural and urban areas). The period of trade liberalization beginning in 1991 is considered. The analysis is thus, based on data from the five thick rounds for the years 1993-94, 1999-00, 2004-05, 2009-10 and 2011-12 of Employment and Unemployment surveys of NSSO.

The results of the relation between trade openness and unemployment conform that trade openness leads to fall in unemployment. The results also found that the negative effect of trade openness on the unemployment rate is higher and stronger for relatively flexible states by taking the interaction term of trade openness and labour market flexibility indicator in the regression. Thus, we found evidence that trade liberalization reduces unemployment in states

and more so in the states with flexible labour markets. This effect is also found to be stronger for rural parts of the states than their urban counterparts, implying that the rural sector is driving the results of total states and is dominant in explaining unemployment situation of the country.

The study is structured as follows: Section II presents a review of empirical literature. Section III presents in detail econometric model and methodology adopted, to empirically test the hypothesis of the study along with definitions of variables included in the model and sources used to collect data on these variables. Section IV discusses and analyses the econometric results obtained; and Section V presents the summary and conclusion.

II EMPIRICAL EVIDENCE OF THE IMPACT OF TRADE ON EMPLOYMENT

For analysing the relationship between trade liberalization and unemployment, different approaches have been undertaken by Felbermayr et.al. (2011), Blanchard & Wolfers (2000), Nickell et al. (2005), Sener (2001), Moore & Ranjan (2005), Hasan et.al. (2012) and Goldar (2009).

The proponents of globalization argue that trade expands export markets and hence, give a boost to domestic production, thereby creating more jobs. The paper by (Dutt, Mitra & Ranjan, 2009) empirically tested for both Ricardian and Hecksher-Ohlin models of trade and unemployment. The study used trade policy, unemployment and a number of control variables (like output volatility, black-market premium) on the panel data for 92 countries for the period 1990 – 2000, and found strong evidence for the negative impact of trade openness on unemployment.

Felbermayr et.al. (2011) did not test for a specific theoretical model but presented some robust results for a cross-sections of countries. The paper found that higher openness to trade reduces unemployment. Most of regressions in this paper, provided an overwhelming evidence of a positive effect of trade on employment. Many labour economist have carried out similar analysis based on panel data of OECD countries. Few main studies in this area are Blanchard & Wolfers's (2000), Nickell et.al. (2005) which concentrated on the impact on employment of labour market institutions and macroeconomic shocks and also presented a comprehensive survey.

Said & Elshennawy (2010) explored the same relation for manufacturing sector of Egypt for the period of 1993 – 2006 and provided further support to the above findings. This was also associated with increasing wages for workers in the manufacturing sector, but not for poor wage workers, where it departs from the theory. The similar results were obtained by

Boulhol (2008). Also Matusz (1996) study asserted that trade through improving economy-wide productivity reduces the unemployment rate.

The opponents of openness demonstrate that domestic output and employment falls, as lower production costs and fewer regulations in other countries lead to increase in imports and shift of production from domestic firms to foreign firms. Janiak (2006) and Davidson et al., (1999) showed that higher exposure to trade leads to increase in unemployment. The reason being that the shutting down of small low-productivity firms lead to employment losses that are greater than employment creation in large high-productivity firms.

The relationship between trade openness and unemployment depends on other important factors as skills of the labour force and labour market institutions. Sener (2001), Moore & Ranjan (2005) and Bazen & Cardebat (2010) argued that trade liberalization led to an increase in the unemployment of unskilled workers, but the effect on aggregate unemployment is ambiguous. This emphasized that labour possess differing abilities and cannot be treated as homogeneous. Hence, the employment effect of trade openness is also not same across all workers; it is ability-specific.

The study by (Kim, 2011) provided a strong evidence of the importance of labour market institutions for analysing the relationship between trade and employment. The results showed that growth in trade led to rise in aggregate unemployment, if the labour market institutions were rigid, and reduced aggregate unemployment when there were flexible labour market institutions. Helpman & Itskhoki (2010), Boulhol (2008), and Moore & Ranjan (2005), also argued that unemployment increases with lesser barriers on trade. Though, the exporting sectors is expanding but unemployment increases as workers are unable to reallocate towards the exporting sector due to frictions in the labour market. Hasan (2001) estimated reduced form equations for unemployment of the manufacturing sector and average real wages to analyse the effect of trade openness and rigidity of labour market. The results indicated that trade liberalization adversely affected employment and wages. The estimates also indicated that more rigid labour markets experienced higher wages but at the cost of lower employment. Thus, suggesting that trade liberalization is probably more advantageous for flexible labour markets and vice versa.

Another factor which can influence the impact on unemployment is how trade affects the own-price elasticity of labour demand. According to Rodrik (1997) trade increases the labour demand elasticity. This happens due to increase in trade in inputs, which leads to availability of more substitutes and hence raises the elasticity of substitution between labour and other inputs. It also affects it indirectly by increasing the elasticity of demand for import-

competing goods because of increase in availability of cheaper imported goods. If trade openness leads to increase in productivity and output growth, then more elastic labour demand will lead to higher growth in wages and employment in those countries. This could then be another channel through which trade might benefit workers by raising their wages and reducing unemployment. The studies undertaken for the developed countries like Slaughter (2001) found mixed evidence of the rise in labour demand elasticity in the wake of trade liberalization. The studies undertaken for developing countries like Krishna et.al. (2001) found no significant effect of trade reforms on labour-demand elasticity.

The studies concentrating on the Indian economy are relatively few, and in most of these studies, the impact of trade on poverty is analysed and labour market effects are captured indirectly, except in Hasan et.al. (2012). Hasan, Mitra & Ural (2007) and Cain, Hasan & Mitra (2010) analysed the impact of trade on poverty. The results were more or less similar in both studies that trade liberalization had poverty reducing effects in the states and these positive effects were stronger in states with more flexible labour market institutions, better transportation connectivity and developed financial systems. The two studies by Topalova (2005 & 2010), adopted similar model and methodology for district level and state level poverty data for India, but presented contrasting results. The papers concluded that the poverty reduced in both rural and urban parts of India. But in rural parts, poverty reduction was lesser where employment was concentrated in sectors experiencing larger reductions in tariff protection. In addition, states with flexible labour laws, experienced higher growth rate and in performed better in the phase of liberalization. The explanation of the results have been sought in the lack of the perfect factor mobility in response to liberalization; labour was unable to reallocate away from sectors experiencing reductions in tariffs. Thus, the standard theoretical models of trade fail to explain the relationship between trade liberalization and poverty in rural parts of India.

In Hasan et.al. (2012), unemployment rate for both urban and rural areas had been taken as the dependent variable to analyse impact of trade openness on unemployment for 15 major states and how the effect varies with labour flexibility indicators of states. The data relates to four rounds of NSSO for the years 1987-88, 1993-94, 1999-2000 and 2004-05. The study found that overall state unemployment on average had no significant relationship with average protection over time and across states. However, the study argued that there was evidence of effects of trade protection on overall and urban unemployment in states with relatively flexible labour markets. Hence, trade liberalization there can reduce unemployment.

Hasan, Mitra & Ramaswamy (2003) used industry-level data of manufacturing sector for 15 states of India to examine the impact of trade reforms on labour-demand elasticities. They found that first, labour-demand elasticities rose after the trade liberalization process. Second, an industry with higher protection had lower labour-demand elasticity. And third, elastic labour demand and higher impact of trade liberalization on the elasticity of labour demand was observed for the states with flexible labour markets. Goldar (2009) analysis on labour demand or the employment due to trade liberalization in the Indian manufacturing sector present contrasting view. In this study, econometric results showed that labour demand elasticity was lower in post reform period (1991 – 2004) than in pre-reform period (1980 – 1991).

The overall evidence as to whether trade liberalization leads to fall in unemployment is found to be ambiguous. Different approaches have been adopted to analyse this relationship, but there has been no clear cut conclusion. Generally one can say that the effect is also dependent on country specific factors and hence varies from country to country. So, it is considered better to undertake country level analysis for exploring the issue further. The differences in labour market institutions explain divergence of results for various countries. One shortcoming is that studies analysing trade and employment relationship largely focus on manufacturing employment, with not much concentration on agriculture or services sector. Can these results be generalized to all sectors, to analyse the situation of aggregate employment is debatable.

III MODEL SPECIFICATION, ECONOMETRIC METHODOLOGY AND DATA SOURCES

3.1 Model Specification

The empirical model, given below, is estimated by using the panel data methodology on the data collected for five periods of NSSO thick survey rounds (1993-94, 1999-2000, 2003-04, 2009-10 and 2011-12) and for 21 major states of India.

$$U_{it}^{j} = \alpha + \beta_1 \text{Trade}_{it-1} + \beta_2 \text{Trade}_{it-1} * \text{institution}_i + \beta_i Z_{it} + D + \mu_i + \nu_{it} \quad (1)$$

where U_{it}^{j} = log of unemployment rate of state i and sector j (rural, urban or overall state); Trade_{it-1} = measure of state-level trade openness indicator for state i lagged by one year; institution_i = time-invariant variable capturing the labour market institution for the i^{th} state; Z_{it} = vector of control variables; μ_i denotes the unobservable individual state specific effect and ν_{it} denotes the identically and independently distributed error term.

The dependent variable is standardized aggregate unemployment rate for the state or its rural and urban sectors. The explanatory variable, Trade is measure of trade openness of the state, calculated as total trade (exports + imports) by NSDP ratio. The variable is lagged by one year to account for time required for unemployment to adjust to changes in trade values. The variable 'institution' above, represents measure of labour market institution of states of India. The nature of labour market institutions may influence how trade openness affects unemployment. The labour market institutions have been neglected in past but more recently studies have recognised their importance. The equation also includes two control variables denoted by Z[1] (per capita NSDP and share of population between 15 and 69 age group in total population of the states) and a dummy variable, D.

The total effect of a marginal increase in trade on unemployment rate hence, can be calculated as $\beta_1 + \beta_2$*institution from equation (1) above. The coefficient (β_1) estimates direct effect of trade openness on unemployment. A positive (negative) sign of estimate of β_1 (without taking the second term into account) would imply that increase (decrease) in trade openness leads to increase (decrease) in unemployment rate. However, nature of labour market institution would also influence how openness affects unemployment and is captured by estimate of β_2. A positive β_2 would imply that an increase in international trade leads to higher unemployment in rigid labour market state, whereas it will reduce unemployment in flexible labour market state. The combinations of a positive β_1 and a negative β_2 or vice versa would imply that rigidities in labour markets may reduce the effect of trade openness on unemployment of states (Kim, 2011). .

The above specification and empirical analysis contributes to the existing literature in few respects: Firstly, it defines measure of trade openness as percentage of states' total trade (both exports and imports) in NSDP. This is value / outcome measure of trade openness, in contrast to policy measure used in the existing literature (tariffs and non-tariff barriers of the industries converted into state protection measures by taking employment shares of respective industries as weights). Secondly, it adopts state level reform index developed by OECD (2007) in the empirical analysis. The existing studies incorporated labour market flexibility index developed by Besley & Burgess (2004). This had been criticized extensively by Bhattacharjea (2006), not only on methodological grounds but also on its coverage. Thirdly, the present analysis extends the coverage by taking into account data for last two thick rounds of NSSO

[1] These variables are found to be significant in affecting employment levels of a country in various studies such as Kim (2011), Hasan (2001).

survey of 2009-10 and 2011-12 (not been incorporated in any study on the subject) and by incorporating 21 major states of India (the existing studies focussed only on 15 or 16 major states).

3.3 Definition of variables and sources of data

The definitions of variables used in the model and their data sources are detailed below.

In the year 2000 three new states were made namely, Chhattisgarh, Jharkhand and Uttaranchal which were earlier parts of Madhya Pradesh, Bihar & Uttar Pradesh respectively. These new boundaries of the states have been considered to maintain consistency across years, and data for the newly formed states are constructed accordingly (data is adjusted for Madhya Pradesh, Bihar and Uttar Pradesh, respectively) for period prior to the year 2000.

Unemployment rate: The unemployment rate for the state and its rural and urban sectors, is calculated as proportion of unemployed population to the size of labour force. These are calculated from the data of Employment-Unemployment surveys of NSSO for five quinquennial survey rounds of 1993- 94, 1999- 2000, 2004-05, 2009-10 and 2011-12. The participation in economic activities of household members is determined on the basis of three reference periods and are known as usual status for one year as reference period; current weekly status (CWS) for one week prior to the survey and current daily status (CDS) for each day of seven days prior to the survey as reference period. The study incorporates CWS to calculate unemployment rate. The estimates presented, mostly, refer to mid-point of each survey period for e.g. for survey round of July 2009 – June 2010 of NSSO 66th round, figures would pertain to January 1, 2010.

Trade Openness Variable: The state's total trade (i.e. exports and imports) as a percentage of NSDP is taken as a measure of trade openness for the states in India. To calculate the exports of the states, the study follows the procedures outlined in UNCTAD report (2013) and Barua & Chakraborty (2010). The export orientation of each state is calculated as the share of estimated state's exports in India's total exports.

$$X_i = \left[\sum_{l=1}^{L} \frac{Y_{il}}{Y_l} * X_l\right]$$

where X_i = State i's exports; Y_{il} = State's i's output in industry l; L = total number of industries; Y_l = India's total output in industry l; X_l = India's exports of industry l. It is assumed that the share of a state in India's exports of industry 'l' is same as its share in India's production from industry 'l'. The data for state's output in different industries and total output are taken from Central Statistical Organization (CSO) and data for exports of India is taken from United

Nations Commodity Trade Statistics database (UNCOMTRADE). The industries for which data has been utilized with the corresponding two digit industry codes of ISIC (given in brackets) are: (i) Agriculture (01); (ii) Forestry & Logging (02); (iii) Fishing (05); (iv) Mining & Quarrying (10 + 11 + 12 + 13 + 14); (v) Manufacturing (15 to 36) and (vi) Electricity, Gas & Water Supply (40).

To calculate the value of imports for each state, the methodology given in Barua & Charaborty (2010) is modified a little. The total imports of the country are divided across states in accordance of the weight given by share of GSDP in total GDP of the economy for that period, to arrive at the imports of each state.

$$M_i = \sum_l [M_l * Y_i / Y] \qquad i = 1 \text{ to } 21 \text{ and } l = 1 \text{ to } 6$$

where M_i = Imports of state i; M_l = Imports of industry l (six industries given above); Y_i = GSDP at constant prices of state i; Y = GDP at constant prices of India.

Labour Market Institutions: This refers to OECD index of labour reforms of states in India given in OECD (2007). This index is based on the survey covering eight major labour legal areas and 50 specific topics of reforms for 21 states of India (covering 98% of population and GDP). This is one of the broad measures of labour market institutions at state level for the Indian economy.

There are various indices available to capture the nature of labour market institutions of India – BB index given by Besley & Burgess (2004); Investment Climate Assessment (ICA) Index created by the World Bank (Iarossi, 2009) for 16 major states in India; 'labour ecosystem index' constructed by TeamLease Services (2006) in their India Labour Report; OECD index of state level labour reforms in India presented in OECD (2007). These indices try to capture whether labour regulations are leading to rigidities in the operation of labour markets in India. The OECD index is adopted in the present study, as it is a broad based indicator with respect to its coverage of labour market institutions across states. It focusses only on eight important labour legal areas and does not cover other aspects of states as is done by indices like ICA or 'labour ecosystem index'. ICA looks at the overall investment climate of states and hence includes indicators like infrastructure and governance, apart from institution. 'Labour ecosystem index' is also a broad indicator looking at labour demand, supply and institutions of states of India. BB index though is most widely used in the empirical studies on India, is restrictive and narrow as it only concentrates on IDA and ignores other central and state level labour laws.

Control Variables: There are three control variables included in equation (1) - real NSDP per capita, per capita development expenditures of states and population in the age group of 15 to 69 as a share of total population of states. The data for per capita NSDP at current prices is taken from CSO and are converted to constant 2004-05 prices. The data for proportion of population aged between 15 and 69 for each state is calculated using data of Employment Unemployment surveys of NSSO.

Dummy Variable: To capture high growth phase of India experienced after the year 2000, dummy variable is included in the equation above (takes on value 1 for years after 2000 and 0 for all prior years).

3.3 Econometric Methodology

The panel regression (used to estimate equation (1) given above) is of the form (Baltagi, 2008):

$$y_{it} = \alpha + X'_{it}\beta + u_{it} \qquad i = 1,\ldots\ldots,N; \quad t = 1,\ldots\ldots, T \qquad (2)$$

where i represents cross sectional unit i and t denotes time. α is a scalar, β is $K \times 1$ and X_{it} is the $_{it}$th observation on K explanatory variables. A one-way error component model is assumed for the disturbances: $u_{it} = \mu_i + v_{it}$ where μ_i represents the unobservable individual specific effect and v_{it} denotes the remainder disturbance. The unobservable individual effect (μ_i) can be assumed as unit specific constant term (fixed effects model) or unit specific disturbance (random effects model).

An important assumption is $E(u_{it} / X_{it}) = 0$ and is critical as disturbances contain time invariant effects (μ_i) which are unobserved and may be correlated with the X_{it}. Whether these unobserved individual effects are correlated or not with the regressors is the crucial distinction between fixed and random effects models. Generally the preference is for fixed effects model because it produces consistent estimates even if X_{it} and μ_i are correlated. The random effects estimator is biased and inconsistent in this case.

The critical question is - how to choose between the fixed effects (FE) and random effects (RE) model? This can be dealt in two ways:

(1) Hausman's Specification Test for Fixed versus Random Effects Model – This test is devised by Hausman (1978) and states that under the zero correlation hypothesis, both FE and RE estimators are consistent, but FE estimators are inefficient. Under the alternative hypothesis, FE estimators are consistent but RE estimators are not.

Ho: $Cov(\mu_i, X_{it}) = 0$

H_A: $Cov(\mu_i, X_{it}) \neq 0$

Fixed effects model is preferred in case of rejection of the null hypothesis and alternatively the random effects model is preferred. The test is inappropriate in the presence of either heteroskedasticity or serial correlation, because then the variance formulae of the FE and RE estimators will be invalid. This is a big limitation of this test as it has been argued that in spite of practical considerations of the test, it should be based on robust covariance matrices that do not depend on assumptions of the random effects model. The suggested alternative approach to choose between these two models is variable addition test, which is described below.

(2) Mundlak's Approach – To allow for possible correlations between the explanatory variables and individual effects (in which case RE becomes inconsistent), Mundlak (1978) proposes to estimate following formulation as modified RE model:

$$y_{it} = \alpha + X'_{it}\beta + \overline{X}_i.\gamma + u_{it} \qquad i = 1,\ldots\ldots,N; \quad t = 1,\ldots\ldots, T \qquad (3)$$

where additional variables in the equation, $\overline{X}_i$, are individual means of all time varying variables.

The random effects model is dependent on the assumption of $E(\mu_i / X_{it}) = 0$. Hence, the approach suggest the specification: $E(\mu_i / X_{it}) = \overline{X}_i.\gamma$. Substituting this in the panel regression equation (5) above, gives the Mundlak specification of RE model as in equation (6) above. This preserves random effects specification of the model but deals directly with problem of correlation of these unobserved individual effects and the regressors. Only time varying variables are included in this additional term of $\overline{X}_i.\gamma$.

The test of joint significance of the additional variables in this approach i.e. Ho: $\gamma = 0$ is a Wald test (F-test). This is asymptotically equivalent to the Hausman test of $Cov(\mu_i, X_{it}) = 0$, described above. The Mundlak test statistic is (as given in Greene, 2012):

$$M = \hat{\gamma}'[\text{Estimated Asymptotic Variance } (\hat{\gamma})]^{-1} \hat{\gamma}$$

If the test rejects Ho, Generalized Least Squares (GLS) using the un-augmented RE model is biased ⇒ FE model to be used. If the test doesn't reject Ho ⇒ GLS on the original model is applied. Mundlak (1978) has shown that if the individual effects are a linear function of the averages of all the time varying explanatory variables, then the GLS estimator of this model coincides with the FE estimator. It is hence, also frequently used as a compromise between the FE and RE models.

This model formulation also handles the above limitation of the Hausman specification of non-robust standard errors as it takes into account robust standard errors in estimation of

random effects model to test for the joint significance of additional variables (Ho: $\gamma = 0$). The robust Newey-West standard errors correct for both heteroskedasticity and autocorrelation in u_{it}.

IV ANALYSIS OF THE REGRESSION RESULTS

4.1 Regression Results

The impact of trade openness of states on unemployment rate is analysed by estimating three separate panel regressions for equation (1) above. The estimation results are presented in Table 1 below for total state and its rural and urban sectors.[2] These are the results of final specification of the model after undertaking few iterations.[3]

An important point to consider is that the empirical results would not give the level effects of trade openness on unemployment rate of states in India but it would study the relative impact on states that are more or less open to trade. Thus, the empirical analysis captures unequal effects of trade openness on unemployment of states. Also, the results would help to analyse impact on total employment of states (and its rural and urban sectors) and not only on manufacturing employment which has been main focus of studies in this area. Since, manufacturing employment represent a small proportion of the population, it is better to take into account employment in all sectors of the economy. Hence, the results capture general equilibrium effects of trade openness within states.

[2] The results of FE and RE specifications of the three regressions are given in Appendix I. The choice between the two specifications is based on Hausman test and Mundlak formulation, which is also presented in the tables in Appendix I. To choose the final specification of the model, Mundlak formulation is given preference over Hausman test wherever contradictory results emerge as it is based on robust standard errors, as opposed to non-robust standard errors in Hausman test statistic.

[3] Firstly, the above equation was also estimated without incorporating labour market institution variable. To analyse the impact of labour market rigidities on this effect, the equation was estimated again by taking interaction term of trade and labour market institutions. The explanatory power of the model improved significantly with introduction of interaction term. Secondly, time dummies with base year of 1993 were also introduced in the model but the goodness of fit improved by introducing the dummy variable to capture high growth period of India, after the year 2000 (dtime). Hence, time dummies were excluded and dummy for high growth period was included in final specification of the model.

Table 1: Panel Data Estimates of the Unemployment Equation for the States

Dependent Variable : Log of unemployment rate			
Variables	**Total**	**Rural**	**Urban**
L. Tradelag	-1.5255 (-1.89)*	-1.7791 (-2.09)**	-1.4321 (-1.60)
L. Tradelag*labour institution	0.0632 (1.79)*	0.0647 (1.85)*	0.0454 (1.23)
L. Per Capita NSDP	-0.1475 (-0.54)	0.3041 (0.46)	-0.1184 (-0.39)
L. Working Population Proportion	-1.8279 (-2.98)***	-2.5136 (-3.15)***	-0.7787 (-1.44)
Dtime (2004 - 2011)	0.2113 (2.31)**	0.2072 (2.06)*	0.1427 (1.44)
L. Tradelag-M			1.6074558 (1.40)
L. Tradelag*labour institution-M			-0.06282097 (-1.66)*
L. Per Capita NSDP-M			-0.11643448 (-0.26)
L. Working Population Proportion-M			2.5333278 (1.49)
Constant	13.2134 (3.45)***	12.0400 (2.07)*	-0.3291 (-0.06)
R square within R square between R square overall	0.22 0.37 0.21	0.18 0.27 0.10	0.27 0.52 0.42
Test Statistic for Joint Significance of Slope Coefficients	F(5,20) = 4.10 Prob > F = 0.01	F(5,20) = 3.06 Prob > F = 0.03	Wald chi2(9) = 39.64 Prob > chi2 = 0.00
Selected Model	FE	FE	RE
Observations No. of States	105 21	105 21	105 21

Notes: '***', '**', and '*' imply significance levels of 1 percent, 5 percent and 10 percent respectively.
The figures in parentheses are 't' statistic in case of FE models or 'Z' statistic in case of RE models.
The 't' / 'Z' statistic with robust standard errors are reported for FE and RE models, respectively.
The reported R square is within R square for FE models and overall R square for RE models.
The variables specified with 'M' are additional variables created for Mundlak formulation, calculated as Xi = $\overline{Xi}$.

The results presented for the states and their rural and urban sectors respectively, indicate that trade openness negatively and significantly impact unemployment rate of states with a lag of one year. The increase in trade openness lead to significant reduction in total unemployment rates of states (coefficient of -1.52) and for rural areas of the state (coefficient of -1.8). There is no statistical significant relation found between trade openness and unemployment for urban parts of states. The beneficial impact of trade openness on

unemployment rate has been found in many studies such as Dutt et.al. (2009) for 92 countries; Felbermayr (2011) for 20 OECD countries; Milner & Wright (1998) for Mauritius; Harrison & Revenga (1995) for Costa Rica, Peru and Uruguay; Hasan (2001) for panel of 48 developing countries; Said & Elshennawy (2010) for Egypt and Hasan et.al. (2012) for India.

The presence of interaction term between trade openness and flexibility of labour market institutions shows that this effect is higher for more flexible states than for rigid states and this effect is also significant for both total and rural parts of the states. Kim (2011) also empirically analysed this relationship for 20 OECD countries and found that an increase in trade increases the unemployment when there are rigidities in labour markets and lower aggregate unemployment when the labour market was flexible in a country.

It was also found by Kim (2011) that GDP per capita was negatively influencing unemployment implying the business cycle effect i.e. richer countries tend to have lower unemployment. Meanwhile, for these OECD countries the share of working age population was not found to be significantly impacting the unemployment rate. In results of the present study, the coefficient for per capita NSDP though positive is not found to be significantly affecting unemployment rate. But proportion of working population is found to be reducing unemployment rate.

Surprisingly, coefficient of dummy variable for high growth phase is positive and significant for total state and its rural sub part, indicating that high growth rate of the economy has led to rising unemployment. However, this factor is not found to be significant for urban subcomponent of states. This confirms to 'jobless' growth shown by the Indian economy in last two decades as has been discussed in many studies such as Bhattacherjee (1999). The study concluded that declining employment elasticities with respect to output i.e. more output is produced with lesser employment, is due to higher investment in more capital-intensive industries and technology. Also it has been found that since the mid-1980s, private and public sector enterprises are reducing labour employment, attributing to the observed declining elasticity.

However, Hasan et.al. (2003) and Goldar (2009) looking at Indian manufacturing sector found a positive effect of trade liberalisation on own price elasticity of labour demand. The rise in labour demand elasticity from mid-1990s was largely attributable to trade liberalisation which demonstrated its real impact with a lag in India. They also found a positive association between labour market flexibility and increase in labour demand elasticity.

Thus, the results are quite similar for state as a whole and for rural sectors of states. All explanatory variables (except per capita NSDP) are found to be significant in the regression

results. On the other hand, results for urban sectors of the Indian states reveal a different picture. None of the coefficients are found to be significantly affecting unemployment rate in urban sectors. This implies that the results of states are driven by its rural sectors, which are dominant in explaining unemployment situation of the country.

4.2 Discussion of Results

There is no study analysing impact of trade openness on unemployment rate of India, when trade openness is measured in actual trade values. The study by Hasan et.al. (2012) is closest to the present analysis where this relationship was analysed by taking trade policy measures for states of India. They found no evidence of effect of state level protection measures of tariffs, non-tariff barriers and principal component of the two, on unemployment rate of states. The coefficient though was positive but insignificant. They also introduced interaction term of trade protection and labour market flexibility indicators found that a one percentage decrease in tariff rate led to 1.1 percent decrease in unemployment rate, in states with flexible labour markets.

These results were similar for overall unemployment rate as well as rural and urban unemployment rates of states but this positive relationship was found to be stronger in urban sectors. This is opposite to results of the present study as there is an evidence of stronger negative relation between trade openness and unemployment rate in rural areas than in urban areas. This is surprising as the existing studies primarily focus on the manufacturing sector and urban areas as there are considered to be predominantly affected by trade liberalization (Goldberg & Pavcnik, 2004).

However, according to results of the present empirical exercise, states with higher trade flows experience greater reduction in unemployment rates and this effect is found to be stronger in presence of flexible labour markets. Also, these effects are more pronounced for rural parts of the states. The results hence confirm to the theory that in developing countries trade leads to increase in employment of labour; more so unskilled and a movement away from agriculture and hence rural sector of the economy.

The stronger negative effect (or weaker positive effect) on rural sector had been explained by considering lack of mobility of the Indian population. According to those studies, migration across states in India had been declining in recent decades and largely population was moving across districts within same states and most of migration was amongst women post their marriage. However, these studies have been concentrating on the period 1987-88 to 2003-

04, whereas the present study takes into account the period of 1993-94 to 2011-12. This difference in time periods under consideration is one of the reasons for difference in analysis.

The studies on internal migration showed that mobility of population had declined in India up to 1990's and increased later during post reform period (Kundu & Gupta, 1996 and Bhagat, 2010). According to table 5.3 below, population mobility for overall population declined marginally between 1987-88 & 1993. After that, internal migration had steadily increased from 24.8 percent in 1993 to 28.5 percent in 2007-08. Out of total internal migrants, 70.7% are women migrants. The main factor for female migration (for both rural and urban) is marriage with 91% and 61% respectively. The main factor for male migration is employment-related with respective percentages of 29% and 56% (NSSO, 2007–2008).

The data also substantiated this shift from rural agricultural to rural non-agricultural and urban sectors of the economy. According to the table 5.4 for two NSSO rounds of 1999-00 and 2007-08, rural to rural flow constituted around half of total migration. Rural to urban migration (which increased from 20.9% in 1999-00 to 23.3% in 2007-08) constituted around 25 percent of total, followed by urban-urban and urban to rural. One important point emerged, that for females (prominent reason for migration was marriage) the dominant flow was from rural to rural whereas for males (where prominent reason for migration was employment) the dominant flow was from rural to urban.

Table 2: Migration Rates from Different NSSO rounds

Round (year)	Male	Female	Person
64th (2007-08)	10.9	47.2	28.5
55th (1999-00)	11.7	42.4	26.6
49th (1993)	10.8	39.6	24.8
43rd (1987-88)	11.9	39.8	25.4
38th (1983)	12	35.4	23.4

Source: NSSO (2010), Migration in India 2007-2008.

Table 3: Stream-wise Distribution of Migration by Sex (%)

Migration Streams	Male	Female	Total
55th round (1999-2000)			
Rural-to-rural	32.1	60.5	51
Rural-to-urban	29.8	16.5	20.9
Urban-to-rural	13.1	8.3	9.9
Urban-to-urban	25.1	14.7	18.2
64th round (2007-08)			
Rural-to-rural	27.5	59.6	48.9
Rural-to-urban	33.9	18	23.3
Urban-to-rural	12.1	6.8	8.6
Urban-to-urban	26.5	15.6	19.2

Source: NSSO (2010), Migration in India 2007-2008.

The studies have also shown that this rural to urban migration was largely motivated by availability of employment in urban informal sector. Thus, there had been a strong relationship between rural-urban migration and the growth of urban informal sector. The development analysts also stressed that liberalization process, which started in 1990s in the Indian economy, led to sharp acceleration in real economic growth (over 8% p.a.) and opened up job opportunities in and around cities in many globally linked sectors (Kundu, 2012). Hence, one can say that India witnessed an upsurge of urban informal sector in the post liberalization era which led to influx of migrant population from rural areas to urban areas across states of India (Chakraborty & Kuri, 2013).

According to Mahapatro (2012), latest NSSO estimates of 2007-08 also showed that for both males and females, proportion of migrants in salaried and wage earning class had been increasing. However, it was not necessarily implied that migrants were better off economically as various types of occupations were clubbed together in this class. These estimates also revealed that large proportion of females have been employed in agriculture, followed by manufacturing, education, trade and commerce etc., both before and after migration. The employment of male migrants however, had been found to be highest in manufacturing (26%), followed by trade & commerce (24.5%) and agriculture (12%). The before migration employment though, was higher in agriculture sector (28.4%).

V SUMMARY AND CONCLUSION

This study empirically examines the impact of trade openness on unemployment rate of the states and for its rural and urban sectors of India. The survey of literature concludes that there is ambiguity in the impact of trade openness on aggregate unemployment. One important

point emerges that it is better to undertake country case study, as country specific effects play an important role in this relationship. The empirical evidence on trade and unemployment relationship also emphasize the importance of differences in labour market institutions explaining divergence of results for various countries.

The panel regression on 21 states of India for five thick rounds of NSSO data (1993-94, 1999-00, 2004-05, 2009-10 and 2011-12) is estimated using FE and RE specifications and two tests of Hausman specification test and Mundlak formulation are conducted to choose between the two. The results with robust standard errors of the final specification selected are then presented.

The results find evidence for the negative relationship unemployment and trade openness. The results indicate that trade openness negatively and significantly affect the unemployment rate of the states with a lag of one year. The relationship is significant for rural parts of the states which also drive results for the total state; though for urban part of the states, relationship is not found to be significant. The results also indicate that this effect is higher and stronger for more flexible states, by taking interaction term between trade openness and labour market institutions in the empirical exercise.

Amongst the control variables, per capita NSDP is not found to be significantly affecting unemployment rate whereas proportion of working population in a state is negatively and significantly affecting unemployment rate and dummy variable for high growth phase is positively and significantly affecting unemployment rate for the states and its rural sub component. These are again, not found to be significant for urban India.

This study provides support to the argument that effects of trade liberalization have been different for the states in India. The results hence, confirm to the theory that in developing countries trade openness leads to increase in the employment of labour; but more so of unskilled workers and leads to a movement away from the agriculture and hence rural sector of the economy.

This is substantiated by internal migration trends for India which showed an increase in population mobility during post reform period. The data also corroborated the shift from rural agricultural to rural non-agricultural and urban sectors of the economy. For the period of 1999-00 and 2007-08 (based on data from NSSO), rural to rural migration constituted around half and rural to urban constituted around 25% of the total. The new employment opportunities, largely casual in nature, had been created in the construction sector of rural sectors of India (Thomas, 2012).

Overall, the above results provide evidence that trade openness reduces unemployment in states and more so in states with flexible labour markets. This effect is found to be stronger for rural parts of the states than their urban counterparts. This implies that trade policies and labour policies are interrelated and hence the coherence of these two policies is important for trade reforms to significantly and positively affect the employment of a country.

APPENDIX

Table 1: Panel Data Estimates of the Unemployment Equation for the States (Rural + Urban combined)

Dependent Variable : Log of unemployment rate				
Variables	**Fixed Effects (1)**	**Random Effects (2)**	**Mundlak Formulation of RE (3)**	**Chosen Model (Fixed Effects) (4)**
L. Tradelag	-1.5255 (-2.70)***	-0.0870 (-0.39)	-1.5031 (-1.84)*	-1.5255 (-1.89)*
L. Tradelag* labour institution	0.0632 (2.58)**	-0.0146 (-2.27)**	0.0624 (1.74)*	0.0632 (1.79)*
L. Per Capita NSDP	-0.1475 (-0.65)	0.1898 (1.31)	-0.1536 (-0.55)	-0.1475 (-0.54)
L. Working Population Proportion	-1.8279 (-2.91)***	-1.1253 (-1.90)*	-1.8605 (-2.96)***	-1.8279 (-2.98)***
Dtime (2004 - 2011)	0.2113 (1.92)*	0.1563 (-1.42)	0.2104 (2.25)**	0.2113 (2.31)**
L. Tradelag-M #			1.5227 (1.34)	
L. Tradelag*labour institution-M #			-0.0790 (-2.04)**	
L. Per Capita NSDP-M #			0.1193 (0.27)	
L. Working Population Proportion-M #			5.0100 (1.95)*	
Constant	13.2134 (3.75)***	7.5782 (2.92)***	-8.0411 (-1.05)	13.2134 (3.45)***
R square within R square between R square overall	0.22 0.37 0.21	0.09 0.31 0.24	0.22 0.44 0.37	0.22 0.37 0.21
Test Statistic for Joint Significance of Slope Coefficients	F(5,79) = 4.37 Prob > F = 0.0015	Wald chi2(5) = 15.68 Prob > chi2 = 0.0078	Wald chi2(9) = 33.38 Prob > chi2 = 0.0001	F(5,20) = 4.10 Prob > F = 0.0100
Hausman p value	0.0176			
Mundlak test for Fixed v/s Random Effects			chi2(4) = 7.93 Prob > chi2 = .09	
Selected Model	Fixed Effects		Fixed Effects	
Observations No. of States	105 21	105 21	105 21	105 21

Notes: '***', '**', and '*' imply significance levels of 1 percent, 5 percent and 10 percent respectively.
The figures in parentheses are 't' statistic in case of FE models or 'Z' statistic in case of RE models.
The 't' / 'Z' statistic with non-robust standard errors are reported for initial FE and RE models. The 't' / 'Z' statistic with robust standard errors are reported for Mundlak formulation and selected model.
The reported R square is within R square for FE models and overall R square for RE models.
The variables specified with 'M' are additional variables created for Mundlak formulation, calculated as Xi = $\overline{Xt}$.

Table 2: Panel Data Estimates of the Unemployment Equation for the States (Rural)

Dependent Variable : Log of unemployment rate				
Variables	**Fixed Effects (1)**	**Random Effects (2)**	**Mundlak Formulation of RE (3)**	**Chosen Model (Fixed Effects) (4)**
L. Tradelag	-1.7791 (-2.00)**	-0.0288 (-0.09)	-1.7068 (-2.01)**	-1.7791 (-2.09)**
L. Tradelag* labour institution	0.0647 (1.67)*	-0.0178 (-2.26)**	0.0622 (1.76)*	0.0647 (1.85)*
L. Per Capita NSDP	0.3041 (0.85)	0.3511 (1.84)*	0.2861 (0.43)	0.3041 (0.46)
L. Working Population Proportion	-2.5136 (-2.54)**	-2.0188 (-2.31)*	-2.6011 (-3.15)***	-2.5136 (-3.15)***
Dtime (2004 - 2011)	0.2072 (1.20)	0.1899 (1.16)	0.2046 (1.99)**	0.2072 (2.06)*
L. Tradelag-M #			1.9857 (1.43)	
L. Tradelag*labour institution-M #			-0.0788 (-2.02)**	
L. Per Capita NSDP-M #			-0.5073 (-0.51)	
L. Working Population Proportion-M #			6.6584 (2.08)**	
Constant	12.0400 (2.17)**	9.4832 (2.62)***	-10.9030 (-1.19)	12.0400 (2.07)*
R square within R square between R square overall	0.18 0.27 0.10	0.13 0.20 0.17	0.18 0.34 0.27	0.18 0.27 0.10
Test Statistic for Joint Significance of Slope Coefficients	F(5,79) = 3.54 Prob > F = 0.0062	Wald chi2(5) = 16.94 Prob > chi2 = 0.0046	Wald chi2(9) = 22.24 Prob > chi2 = 0.0082	F(5,20) = 3.06 Prob > F = 0.0327
Hausman p value	0.0316			
Mundlak test for Fixed v/s Random Effects			chi2(4) = 8.51 Prob > chi2 = .0745	
Selected Model	Fixed Effects		Fixed Effects	
Observations	105	105	105	105
No. of States	21	21	21	21

Notes: Same as Table 1.

Table 3: Panel Data Estimates of the Unemployment Equation for the States (Urban)

Dependent Variable : Log of unemployment rate				
Variables	**Fixed Effects (1)**	**Random Effects (2)**	**Mundlak Formulation of RE (3)**	**Chosen Model (Random Effects) (4)**
L. Tradelag	-1.4644	-0.1289	-1.4321	-1.4321
	(-2.65)***	(-0.68)	(-1.60)	(-1.60)
L. Tradelag* labour	0.0465	-0.0166	0.0454	0.0454
institution	(1.94)*	(-3.45)***	(1.23)	(1.23)
L. Per Capita NSDP	-0.1103	-0.0372	-0.1184	-0.1184
	(-0.5)	(-0.32)	(-0.39)	(-0.39)
L. Working Population	-0.7305	-0.4601	-0.7787	-0.7787
Proportion	(-1.19)	(-0.85)	(-1.44)	(-1.44)
Dtime (2004 - 2011)	0.1443	0.1116	0.1427	0.1427
	(1.34)	(1.09)	(1.44)	(1.44)
L. Tradelag-M #			1.6075	1.6075
			(1.40)	(1.40)
L. Tradelag*labour			-0.0628	-0.0628
institution-M #			(-1.66)*	(-1.66)*
L. Per Capita NSDP-M #			-0.1164	-0.1164
			(-0.26)	(-0.26)
L. Working Population			2.5333	2.5333
Proportion-M #			(1.49)	(1.49)
Constant	9.6507	7.7835	-0.3291	-0.3291
	(2.8)***	(3.48)***	(-0.06)	(-0.06)
R square within	0.27	0.20	0.27	0.27
R square between	0.41	0.46	0.52	0.52
R square overall	0.16	0.36	0.42	0.42
Test Statistic for Joint Significance of Slope Coefficients	F(5,79) = 5.79 Prob > F = 0.0001	Wald chi2(5) = 35.27 Prob > chi2 = 0.0000	Wald chi2(9) = 39.64 Prob > chi2 = 0.0000	Wald chi2(9) = 39.64 Prob > chi2 = 0.0000
Hausman p value	0.0362			
Mundlak test for Fixed v/s Random Effects			chi2(4) = 4.57 Prob > chi2 = .3340	
Selected Model	Fixed Effects		Random Effects	
Observations	105	105	105	105
No. of States	21	21	21	21

Notes: Same as Table 1.

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