Journal of Tourism and Sports Management (JTSM) (ISSN: 2642-021X)
SciTech Central Inc., USA

2024
Vol. 6(1)
1805-1819

EFFECTS OF UNEMPLOYMENT ON ECONOMIC GROWTH URBANISATION AND MIGRATION IN INDIA DURING 1991-2011 A TIME-SERIES ANALYSIS & PANEL DATA ANALYSIS

Pritha Kundu*

Department of Economics, Techno India University, India.

Received 06 September 2023; Revised 17 September 2023; Accepted 20 September 2023

ABSTRACT

Unemployment is a situation where people are employable and are seeking for jobs but are unable to find any job. In India economic development has occurred gradually since independence. Indian economy was opened up in 1991 to boost productivity and job opportunities. So, economic growth of any country depends on the employment as well as unemployment situation of any country. First this paper has estimated the long-term relationship between unemployment and GDP for the post reform period and after-that the long-term relationship between unemployment and urbanization for the post reform period. For both the cases, the relationship is negative. So, to attain the expected economic growth and urbanization one country should reduce the unemployment problem in India. In-migrants are negatively related with unemployment with statistically significance and out-migrants are positively related with unemployment during 1991-2011. So, people always try to migrate in those places where unemployment rates are low. Therefore, Govt. should always try to improve the employment situation in India by creating employment generation schemes in India.

Keywords: Urbanization, Unemployment, Time-series analysis, Cointegration, Augmented Dickey-Fuller Test, Granger causality test, Panel data analysis

Jel code: C01, C22, C23, C32, C33, J64, O18, P25, R23.

INTRODUCTION

The level of development of any economy influences the changes of employment. Therefore, when an economy makes progress and its production expands, it is expected that the employment opportunities grow at a steady rate. In India, economic development has occurred gradually since independence and opening up boost up productivity and job opportunities, due to globalization, industrialization and infrastructural development of the states. Thus, India is at an acceleration stage of the process of economic growth. But,

***Correspondence to**: Pritha Kundu, Department of Economics, Techno India University, India, Tel: 9836629588; E-mail: pritha.kundu04@gmail.com

though the employment opportunities are increasing but can't create jobs in organized sector. Due to the development, many industries are emerging in urban India and periphery of urban areas. As the scope of job creation in rural areas are limited so disguised unemployed person of rural areas are migrated from there to urban areas in search of jobs. So rural-urban migration is increasing and as a result urbanization is also increasing. Urbanization is a socio-economic phenomenon rather is a process of transformation which includes behavioral transformation, structural transformation and demographic transformation. In the Indian context Mathur & Stein (1993) has observed that over a period of time natural increase has replaced rural to urban migration as the principal determinant of urbanization. Though natural increase of population is the greater contributor of urbanization in India, but migration has a long-term effect (Keyfitz & Philipov, 1981). India has been experiencing the rapid urbanization due to the flow from rural to urban migration. Kumar and Sinha (2018) observe that the one of the important push factors of migration is unemployment. So, unemployment has an important impact on economic growth, urbanization and on migration in India.

REVIEW OF LITERATURE

In the process of economic growth, most of the time it is found that economic growth is higher than employment growth because a good part of economic growth is derived from an increase in productivity and only a part from using more labor. In India, unemployment attributed negative development of economic activities (Chand, Tiwari & Phuyal, 2017). But according to Padder & Mathavan, (2021) there is no such inverse relationship between economic growth and unemployment in India.

The liberalization and privatization process of the 1990s has brought about accelerated growth in India's GDP, but in case of the growth of employment it has decelerated which is described as "jobless growth" (Padder, 2018). According to Bhattacharya & Sakthivel, (2007) estimates although there has been a mild acceleration in the output growth rate in the post-reform period, there has been a sharp decrease in the employment growth rate during the same years in India and its constituent states. (Ghose (2015). has studied that improvement of employment condition in India requires transfer of labor from the unorganized sector to the organized sector, which can only be possible when the rate of growth of organized sector employment exceeds that of the labor force in the economy and laborers are trying to develop themselves in skill-based education.

The patterns of urbanization are very diverse among the states. Delhi, Goa & Mizoram have recorded the significant level of urbanization. In India urbanization has increased faster than expected during 2001-2011 (Bhagat, 2001). Though the urbanization rate is increasing but urbanization mainly occurred due to migration from rural to urban areas, so unemployment in urban areas are increasing. Giri, (1998) found that during 1970-80 there was faster population growth in the small & medium urban centers as because of the location shift of various secondary and tertiary sectors. As rapid population

growth could not be absorbed by agricultural sector so there was an increase in workforce participation in low income urban activity. Kundu & Mohanan, (2009) observed that workers population ratio had increased in recent years particularly for women. Unemployment had increased sharply under daily status as because of mismatch between growth in employment and labor supply, as the poor household send larger number of family members to survive. Prakash & Abraham, (2008) explain the trends in unemployment which indicate lower unemployment rate during post-reform period as compared to pre-reform period. Chowdhury, (2011) concentrated on the NSS data of 2009-10 and observed that there was a stagnant condition in Indian employment. There was a decrease in unemployment, but not because of an increase in employment rather a decrease in the number of people participation in the work. Levine, (2011) in his paper has opined that in India with the help of economic growth unemployment problem can be removed or new employment can be generated. In fact, during post reform period jobless growth has become menacing problem for which inclusive growth strategy has been taken in 11^{th} five-year plan to overcome this bad situation (Parvathamma, 2014). Prakash & Abraham, (2008) explain the trends in unemployment which indicate lower unemployment rate during post-reform period as compared to pre-reform period. Nair, (2020) has recommended that, to reduce unemployment adequate skill based and vocational training is required, also increasing Govt. investment is needed.

Objective of the Study Data Collection and Variables

This study employs annual time series data over the period of 1991-2019 for India. We get the annual time series data about Unemployment and GDP during 1991-2019 from ILO. From the Census of India, we can get the Urbanization and Migration data for three distinct decades. The first objective of this paper is to investigate the relationship between economic growth and unemployment during post-reform period using time-series data. The second objective is to find out the relationship between urbanization and unemployment. The third objective is to estimate the effect of unemployment on migration during 1991-2011.

ESTIMATES

Relationship between Economic growth and Unemployment during 1991-2011: Long-run analysis

Unemployment is one of the most important socio-economic features for any country. So, economic growth of any country depends on the employment as well as unemployment situation of any country. First this paper will estimate the long-term relationship between unemployment and GDP for the post reform period. The cointegration between them can be checked by the using Engle- Granger method. The steps are:

Transforming the GDP and Unemployment data in logs we examine their stationarity by applying the ADF test. From **Table 1** we can say that both

lgGDP and lgUnemployment is non-stationary in level but stationary in first-difference, i.e. lgGDP-I(1) and lgUnemployment-I(1).

Table 1. Augmented Dickey-Fuller Test of logUnemployment and GDP during 1991-2019.

Variables	ADF Test	Critical Values			Conclusion
		1% level	5% level	10% level	
LogUnemployment (intercept)	-1.63	-3.59	-2.93	-2.60	Non-stationary
LogUnemployment (Trend & Intercept)	-2.19	-4.19	-3.52	-3.19	Non-Stationary
D(logrUnemployment) (Intercept)	-4.54	-3.59	-2.93	-2.60	Stationary
D(logrUnemployment) (Trend & Intercept)	-4.64	-4.19	-3.52	-3.19	Stationary
LogGDP (Intercept)	-3.35	-3.59	-2.93	-2.60	Non-Stationary
LogGDP (Trend & Intercept)	-6.89	-4.18	-3.52	-3.19	Non-Stationary
D(logGDP) (Intercept)	-4.54	-3.59	-2.93	-2.60	Stationary
D(logGDP) (Trend & Intercept)	-4.64	-4.18	-3.52	-3.19	Stationary

Source: Author's own calculation

Since both the variables are I(1), we run a simple OLS regression of lgUnemployment on lgGDP using the ordinary least square method.

The estimated regression equation is:

$$\text{lgGDP} = -3.667\ \text{lgUnemployment} + 1.107 \quad (1)$$
$$(3.33\ ***) \qquad (3.93\ ***)$$

So, from this regression equation, we get the result that Gross Domestic Product have a negative relationship with Unemployment. From the relationship we get the idea that, 1% increase in unemployment will decrease GDP by 3.667%. So, with the increase in unemployment the GDP rate decreases, i.e. if the unemployment rate increases then economic growth will decrease. In the equation 1, both GDP and Unemployment variables are in logs, the estimated slope coefficient (-3.667) represents long-run elasticity of GDP to change in unemployment.

Now, we will generate the residual series i.e. the error term series for each year to estimate the cointegration test. Using ADF test, we will check the residual series is stationary or not. Using this test, we come to know that the residual series is stationary in level (the null hypothesis of a unit root is rejected). This implies that the cointegration between GDP and Unemployment is valid.

As there is cointegration between GDP and Unemployment, we estimate the error correction model. This ECM can be summarized as:

$$d(\text{lgGDP}) = 0.015589 - 2.74d(\text{lgunemp}) - 0.8735(\text{res})t - 1 \quad (2)$$

$$0.207926 \qquad 1.97 * \qquad -5.221 **$$

These results are quite satisfactory especially because the coefficient of the residual is negative and statistically significant, which implies that if there were any short-term disturbances from the long-run stable relationship, such a disturbance would be corrected over time and the long-run stable relationship would be resorted. Here, -2.74 gives short-run elasticity of GDP with respect to change in Unemployment. This is expectedly lower than the long-run elasticity.

JOHANSEN APPROACH

Cointegration, an econometric property of time series variable, is a precondition for the existence of a long run or equilibrium relationship between two or more variables having unit roots (i.e. Integrated of order one). The Johansen approach can determine the number of co-integrated vectors for any given number of non-stationary variables of the same order (Ray, Pal & Ray, 2011).

Also, from Johansen test of co-integration we can determine the long run relationship between the GDP and Unemployment during 1991-2019.

To check the cointegration relationship between GDP and Unemployment, it is necessary to find optimal log length. Using LR, FPE, AIC and HQ we can determine the optimal lag length, which reveal that the optimal lag length is 2 **(Table 2).**

Table 2. Cointegration Test (Trace test indicates has 1 cointegrating equation at the 0.05 level).

Trace Statistics Test				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None*	0.473218	16.39663	15.49471	0.0217
At most 1	0.000557	0.013381	3.841466	0.9077
Eigen Value Test:				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.473218	15.38325	14.26460	0.0331
At most 1	0.000557	0.013381	3.841466	0.9077

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level.

So, from these two statistics we get the idea that, from both trace statistics and Maximum Eigen Value test we get that there is long run relationship between GDP and Unemployment i.e. there are some cointegration between them.

ERROR CORRECTION MECHANISM

In order to check the stability of the model we have estimated the vector error correction (VECM) model. The results of VECM model are presented in **Table 3.** The results indicate that the error correction term for GDP growth bears the correct sign i.e. it is negative and statistically significant at 5 percent significant level. It indicates 23 percent speed of convergence towards equilibrium position in case of any disequilibrium situation.

Table 3. Short term causality test for time series data (VECM).

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ECM	-0.239700	0.057035	-2.712484	0.0134
D(LOGGDP(-1)	0.148729	0.352946	0.421391	0.6780
D(LOGGDP(-2)	0.021635	0.230636	0.093804	0.9262
D(LOGUNE(-1)	7.303843	16.60197	0.439938	0.6647
D(LOGUNE(-2)	9.074474	16.85826	0.538281	0.5963

Source: Author's Own Calculation

The results were checked for stability using the variance decomposition approach. This technique is used to compare the contribution extent of various time series. From variance decomposition approach, we get the idea that in 10 years periods 64.39% portion of GDP is contributed by own innovative shocks **(Table 4).** On the other hand, 35.61% deviation in GDP occurs due to unemployment reason.

Table 4. Variance Decomposition of Log_GDP.

Variance Decomposition of LOG_GDP			
Period	S.E.	LOGGDP	LOGUNE
1	0.333017	100.0000	0.000000
2	0.349908	91.68208	8.317923
3	0.351290	91.59038	8.409625
4	0.504608	64.04744	35.95256
5	0.523644	66.58039	33.41961
6	0.527226	66.03925	33.96075
7	0.536896	63.69218	36.30782
8	0.537143	63.70720	36.29280
9	0.539845	64.04452	35.95548
10	0.542579	64.39100	35.60900

Granger causality test estimates whether the lagged variable of a variable can be introduced into other variable equations, to determine how the lagged variable can explain other variables. **Table 5** suggest that, Unemployment granger causes economic growth i.e. GDP during 1991-2019, but GDP does not granger cause Unemployment.

Table 5. Inspection results of granger causality test.

Null Hypothesis	Obs	F-Statistic	Prob Conclusion
LOGUNE does not Granger Cause LOGGDP	25	6.33499	0.0030; Reject Null Hypothesis
LOGGDP does not Granger Cause LOGUNE	1.41211		0.2749; Accept Null Hypothesis

Trend of Urbanization in India During 1991-2011: An Inter-State Analysis

In this section we are to examine the urbanization rate among the states in India during 1991-2011. The urbanization rate of any economy like India is the ratio between the urban population and the total population of the economy. Our estimates **Table 6** reveal that irrespective of sex the urbanization rate has varied in India and its constituent states during the period under study. At the all-India level, it has increased from 25.43% in 1991 to 27.82% in 2001 and to 31.14% in 2011. It has increased in all the states excepting Bihar during 1991-2011. In 1991, irrespective of sex among the bigger states Maharashtra has shown the highest position in terms of urbanization rate, whose position has lost by Tamil Nadu both in 2001 and 2011. Among the smaller states, Goa has taken the highest position for the three census years. Six bigger states namely Gujarat, Karnataka, Kerala, Maharashtra, Punjab, Tamil Nadu, West Bengal and two smaller states namely Goa & Mizoram have shown the higher urbanization rate than the national level for the three census years irrespective of sex. All the union territories have the higher urbanization rate than the national level during 2001 - 2011. During 1991-2011, three major states namely Haryana, Kerala, Tamil Nadu and three smaller states namely Goa, Nagaland, Sikkim have shown an increase in rank. Among them, Kerala has shown the highest increase in rank with an increase in urbanization rate from 26% to 48%. Tripura is the only state which has shown the equality in ranking of urbanization during 1991-2011. It is observed that the smaller states and the union territories have recorded a significant urbanization level with Delhi topping the list where 93% are the urban population. The union territories have taken the first five ranking in urbanization rate in the three decades except in 2001and Goa has taken the fourth position. Among the bigger states, Assam and Bihar have respectively achieved the lowest urbanization rate in 1991and in 2011. Among all states and union territories, Dadra & Nagar Haveli is the least urbanized union territory in 1991, but Himachal Pradesh has occupied the same position with only 10% level of urbanization in the last two decades. During 1991-2011, only few.

Table 6. Rate of Urbanization in Indian States during 1991-2011.

India/States/ Union Territories	1991			2001			2011		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
India	25.43	25.87	24.97	27.82	28.29	27.31	31.14	31.37	30.91
Bigger States									
Andhra Pradesh	26.89	27.08	26.70	27.30	27.49	27.12	33.36	33.45	33.27
Assam	11.10	11.61	10.54	12.90	13.33	12.44	14.10	14.18	14.01
Bihar	13.14	13.62	12.62	10.46	10.75	10.14	11.29	11.43	11.15
Gujarat	34.49	34.98	33.95	37.36	38.16	36.49	42.60	43.48	41.64
Haryana	24.63	24.58	24.68	28.92	29.14	28.67	34.88	34.98	34.76
Karnataka	30.92	31.40	30.42	33.99	34.39	33.57	38.67	38.87	38.46
Kerala	26.39	26.43	26.36	25.96	25.97	25.96	47.70	47.54	47.85
Madhya Pradesh	23.18	23.64	22.67	26.46	26.75	26.14	27.63	27.82	27.44
Maharashtra	38.69	39.90	37.40	42.43	43.54	41.22	45.22	45.85	44.55
Orissa	13.38	14.13	12.60	14.99	15.60	14.36	16.69	17.09	16.27
Punjab	29.55	29.77	29.30	33.92	34.41	33.36	37.48	37.88	37.04
Rajasthan	22.88	23.25	22.47	23.39	23.77	22.97	24.87	25.06	24.67
Tamil Nadu	34.15	34.39	33.91	44.04	44.17	43.91	48.40	48.31	48.48
Uttar Pradesh	19.84	20.04	19.62	20.78	21.02	20.52	22.27	22.48	22.04
West Bengal	27.48	28.35	26.53	27.97	28.58	27.32	31.87	31.97	31.77
Smaller States									
Arunachal Pradesh	12.80	13.77	11.66	20.75	21.60	19.81	22.94	23.52	22.31
Chhattisgarh				20.09	20.69	19.49	23.24	23.65	22.83
Goa	41.01	41.80	40.20	49.75	50.45	49.04	62.17	62.74	61.59
Jharkhand				22.24	23.09	21.35	24.04	24.53	23.54
Himachal Pradesh	8.69	9.37	7.99	9.80	10.75	8.82	10.03	10.67	9.37
Jammu & Kashmir				33.00	34.78	31.06	37.69	39.09	36.16
Manipur	27.52	27.28	27.78	26.58	26.17	27.01	29.21	28.62	29.81
Meghalaya	18.60	19.04	18.13	19.58	19.48	19.69	20.07	19.95	20.19
Mizoram	46.10	45.84	46.37	49.63	49.31	49.97	52.11	51.54	52.70
Nagaland	17.21	18.56	15.69	17.23	17.90	16.48	28.86	29.20	28.49
Sikkim	9.11	9.77	8.34	11.07	11.34	10.76	25.15	24.85	25.50
Tripura	15.29	15.19	15.41	17.06	16.96	17.16	26.17	25.99	26.35
Uttaranchal				25.67	27.31	23.96	30.23	31.51	28.91
Union Territories									
Andaman & Nicobar Island	26.71	27.46	25.79	32.64	33.17	31.98	37.70	37.75	37.65
Chandigarh	89.69	88.69	90.95	89.77	88.79	91.03	97.25	97.05	97.51
Dadra & Nagar Haveli	8.47	9.10	7.81	22.89	24.52	20.87	46.72	49.26	43.44
Daman & Diu	46.80	45.52	48.13	36.25	31.25	43.30	75.17	78.45	69.87
Delhi	89.93	89.82	90.06	93.18	93.14	93.23	97.50	97.48	97.53
Lakshadweep	56.31	56.68	55.90	44.41	44.78	44.13	78.07	78.13	78.00
Pondicherry	64.00	63.83	64.17	66.57	66.38	66.76	68.33	68.18	68.48
CV(%)	70.16	68.36	72.19	62.22	60.82	64.00	60.24	60.03	60.37

Source: Census of India, Govt. of India

States have shown the higher female urbanization rate than the male one. The rate of male urbanization rate as well as the total urbanization rate has increased but the female rate has decreased during 1991-2001 in the states of

Gujarat and Himachal Pradesh. During 1991-2001, Nagaland is the only state where the total urbanization rate has increased only due to increase in female rate. During 2001-2011, Himachal Pradesh has shown an increase in total urbanization rate but its male urbanization rate has shown a slightly decreasing rate. In 1991, the female urbanization rate is greater than the male one in the states of Haryana, Manipur, Mizoram, Tripura, Chandigarh, Daman & Diu, Delhi and Pondicherry. In 2001, no bigger states have the higher female urbanization rate than the male one whereas in 2011, Kerala and Tamil Nadu have the higher female urbanization rate than the male one.

Thus, we observe that the rate of urbanization has shown a rising tendency in the states and union territories of India during 1991-2011. Among the states the variation in urbanization rate for female has decreased more than the male one during this period. In 2011 the variation among the states in urbanization rate is more or less same for male and female.

Trend in Urban Unemployment during 1993-2010

During 1993-2010, the urban unemployment in India has decreased from 7.4% to 5.8%, though at first the rate of unemployment has increased slightly from 7.4% to 7.7%. In 1993, among the major states, the urban unemployment was highest for the state Kerala followed by Goa and West Bengal **(Table 7).** In this period, the states, namely Andhra Pradesh, Assam, Bihar, Kerala, Orissa, Tamil Nadu, West Bengal, Goa, Jammu Kashmir and Tripura whose unemployment were higher than the urban unemployment of India. Among all the states, the unemployment is lowest for the state Mizoram in 1993. In 2004-05, among all the states Goa had taken the highest position in urban unemployment followed by Kerala and Assam. Among all the states Arunachal Pradesh had lowest unemployment rate in India. In this time period, for the states, Assam, Bihar, Kerala, Maharashtra, Orissa, Tamil Nadu, West Bengal, Goa, Himachal Pradesh and Nagaland whose unemployment rate were higher than the Indian urban unemployment rate. In 2009-10, the unemployment rate is highest for the state Tripura followed by Kerala and Nagaland. The rate is lowest for the state Sikkim. In this period, some states namely, Bihar, Kerala, Orissa, Punjab, Tamil Nadu, West Bengal, Jharkhand, Himachal Pradesh, Jammu & Kashmir, Nagaland, Tripura and Uttaranchal have higher unemployment rate than the Indian unemployment rate. Almost all the union territories except Dadra & Nagar Haveli, Daman & Diu and Delhi had lower unemployment rate during 1993-2005 and for the next period Chandigarh, Daman & Diu and Delhi had lower unemployment rate than Indian Unemployment rate.

During 1993 to 2005, the unemployment rate has decreased for the following states namely Andhra Pradesh, Gujarat, Haryana, Karnataka, Orissa, Tamil Nadu, West Bengal and Tripura and for the following union territories Andaman & Nicobar Island, Chandigarh, Daman & Diu, Lakshadweep and Pondicherry. For the next period, most of the states had shown decreased except Punjab, Arunachal Pradesh, Jammu & Kashmir, Meghalaya, Nagaland and Tripura. Among the union territories, some union territories had shown a

decrease in urban unemployment, namely Andaman & Nicobar Island, Chandigarh, Daman & Diu, Lakshadweep and Pondicherry during 1993-2010.

Table 7. Rate of Unemployment in Indian States during 1991-2011.

India/States/Union Territories	1993	2001	2010
India	7.4	7.7	5.8
Andhra Pradesh	8.0	7.6	5.5
Assam	9.4	11.9	5.4
Bihar	8.7	9.3	8.8
Gujarat	6.0	4.2	3.1
Haryana	6.6	4.5	4.3
Karnataka	6.3	5.4	4.7
Kerala	17.7	19.1	14.8
Madhya Pradesh	6.8	7.0	5.5
Maharashtra	6.3	8.1	5.6
Orissa	9.8	9.5	6.3
Punjab	4.1	4.9	7.1
Rajasthan	2.4	4.5	3.9
TamilNadu	9.7	8.9	8.0
Uttar Pradesh	4.8	6.2	4.5
West Bengal	12.1	10.6	6.5
Arunachal Pradesh	2.7	2.9	4.9
Chhattisgarh	-	-	4.3
Goa	12.4	26.1	5.1
Jharkhand	-	-	9.1
Himachal Pradesh	3.4	7.8	6.7
Jammu & Kashmir	8.2	6.6	7.1
Manipur	4.4	6.9	5.1
Meghalaya	2.2	4.6	5.5
Mizoram	0.4	3.6	3.4
Nagaland	6.9	10.0	11.6
Sikkim	2.5	7.5	0.2
Tripura	10.8	6.2	18.8
Uttaranchal	-	-	6.2
Andaman & Nicobar Island	11.6	9.7	9.8
Chandigarh	10.2	8.1	4.6
Dadra & Nagar Haveli	1.2	1.9	5.5
Daman & Diu	5.6	3.1	2.5
Delhi	2.1	4.1	3.2
Lakshadweep	21.9	16.5	13.9
Pondicherry	14.9	12.5	9.0

Source: National Sample Survey Organization

Relationship between the Urbanization and Unemployment during 1991-2011: Panel data Analysis

Panel data, also called cross-sectional time series data, are repeated observations on the same set of cross-section units. Two types of information are represented in cross-sectional time-series data: the cross-sectional information, reflected in the differences between subjects, and the time-series

or within-subject information, reflected in the changes within subjects over time. Panel data regression techniques allow researchers to take advantage of these different types of information. A panel dataset should have data on n cases, over t time periods, for a total of n × t observations.

Fixed and Random Effects Models:

Consider the following model: $Y_{it} = X_{it}\beta + \varepsilon_{it}$

Also consider that the error term has the following structure: $\varepsilon_{it} = \alpha_i + \eta_{it}$

Where it is assumed that η_{it} is uncorrelated with X_{it}. The first term of the decomposition, α_i, is called an individual-specific effect; and the second part, η_{it}, corresponds to the common stochastic error term. In this formulation, the first part, α_i, varies across individuals or the cross-section unit but is constant across time; this part may or may not be correlated with explanatory variables. The second part, η_{it}, varies arbitrarily across time and states.

The crucial assumption that distinguishes the fixed effects model from the random effects model is whether α_i may or may not be correlated with the set of explanatory variables, X_{it}:

Random effects model: α_i is uncorrelated with X_{it}.

Fixed effects model: α_i is correlated with X_{it}.

Random Effects

The random effects model has the following structure:

$$Y_{it} = X_{it}\beta + \varepsilon_{it}$$

$$\varepsilon_{it} = \alpha_i + \eta_{it}$$

The main assumption that differentiates this model from the fixed effects model is that the time-invariant country-specific effect α_i is uncorrelated with X_{it}.

Fixed Effects

In contrast to the random effects case, the crucial assumption in the fixed effects model is that $cov(X_{it}, \alpha_i) \neq 0$. The model must therefore be estimated conditionally on the presence of the fixed effects.

$$Y_{it} = X_{it}\beta + \alpha_i + \eta_{it}$$

Where the α_i are unknown parameters to be estimated. However, consistent estimates of these additional parameters cannot be obtained (Cancado,2005). The Hausman test is used to test either RE estimators or FE estimators are consistent. If α_i is uncorrelated with the explanatory variables, in this case, RE estimators are more efficient than FE estimators. If a_i unobserved heterogeneity is correlated with the independent variables in the case, RE estimators are biased, while FE estimators are consistent. The hypothesis is formulated the following way under Hausman test as:

H_0: Corr (a_i, x_j) = 0 RE estimators are more efficient than FE estimators.

H_1: Corr (a_i, x_j) $\neq$ 0 FE estimators are more efficient than RE estimators.

To decide between fixed effect model or random effects model, we run simple Hausman test where the null hypothesis is that the random effect model is more efficient vs. the alternative hypothesis the fixed effect model is more efficient.

Choosing between Fixed Effects, Random Effects and Hausman Test:

The generally accepted way of choosing between fixed and random effects is running a Hausman (1978) test. The Hausman estimator is consistent and efficient, being usually the best choice when compared to both fixed and random effects estimators (Bhaumik, 2015).

Here our objective is to examine the relationship between urbanization and unemployment by using Census of India and NSSO for three census years. Using panel data analysis, the relationship between Urbanization and Unemployment in India has been checked during 1991-2011. The relationship can be written as,

$$\underset{0.0452}{\text{Urbanization}} = 0.00324 - 0.074760 * \text{Unemployment}$$

From equation, it is found that there is an inverse relationship between urbanization and unemployment. Further the estimated coefficients of both the variables are statistically significant at 5% level. Thus, we can say that as the percentage of unemployment increases the urbanization in India falls.

Hausman Test

The selection between Fixed Effect Model and Random Effect Model is performed more rigorously by applying the Hausman test **(Table 8)**.

Table 8. Hausman test results.

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.313400	1	0.5756

If computed value of Chi-square is greater than the tabulated value, then we will reject that REM is consistent. Chi-square value is less than the tabulated value i.e. Random Effect Model gets accepted on the basis of Hausman test as the computed Chi-square value is statistically insignificant. Thus, we will choose Random effect model for this panel data. The Hausman test implies (correctly) the use of the random effects model formulations. The result shows the value of chi-square is 0.3134 which indicates that we accept the null hypothesis that the random effect model is more consistent and reject the alternative hypothesis that the fixed-effects model is consistent and efficient.

Relationship between Migration and Unemployment

Migration, as a component of growth of urbanization determined by many factors like poor living conditions, low agricultural productivity, poor medical care and unemployment, Employment opportunity, higher income, education, urban facilities etc.(lee,) among them unemployment is one of the important push factors. So due to unemployment in rural area, migration towards urban area from rural area should increase. Intra-state In-migrants are those who are coming from rural areas to urban areas in search of employment i.e. many people leave the rural areas in search of employment due to unemployment problem in rural areas. This study is trying to measure the relationship between the intra-state in-migrants and due to unavailability of time-series data about migration we cannot use the cointegration test between migration and unemployment. Due to urban unemployment people migrated from rural are to urban area. To estimate the relationship between the inter-state in-migrants and rural-unemployment can be determined using panel data analysis:

$$\text{Intra} - \text{state in} - \text{migrants} \;=\; 0.841 - \underset{(-2.46)}{0.105399} * \text{Rural\_Unemplyment}$$

Also, the relationship between out-migrants and rural-unemployment can be described as:

$$\text{Intra} - \text{state Out} - \text{migrants} \;=\; 0.175 + \underset{(1.69)}{0.13384} * \text{Rural\_Unemployment}$$

Here, from this estimate we came to know that, with the increase in Rural_Unemployment, the flow of migrants from rural area to urban area increases, and this is statistically significant. So, the unemployment is one of the main determinants of rural-urban migration.

Correlated Random Effects - Hausman Test (Table 9)

Table 9. Correlated Random Effects - Hausman Test.

Dependent Variable: In-Migrants			
Test cross-section random effects			
Test Summary	**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random	0.02132	1	0.7632
Dependent Variable: Out-migrants			
Test cross-section random effects			
Test Summary	**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random	0.326384	1	0.5678

In the previous analysis we had discussed earlier that if computed value of Chi-square is greater than the tabulated value, then we will reject that REM is consistent. Chi-square value is less than the tabulated value i.e. Random Effect Model gets accepted on the basis of Hausman test as the

computed Chi-square value is statistically insignificant. Thus, we will choose Random effect model for this panel data. The Hausman test implies (correctly) the use of the random effects model formulations. The result shows the value of chi-square for in-migrants and out-migrants are 0.02132 and 0.3264, which indicate that we accept the null hypothesis that the random effect model is more consistent and reject the alternative hypothesis that the fixed-effects model is consistent and efficient.

CONCLUSION

Unemployment has a long-term effect on economic growth and urbanization during the post reform period. Due to urbanization rural people migrated towards urban areas in search of employment. Though urban employment has increased but it can't cover up all unemployment of urban areas so the rate of unemployment in urban areas can't be reduced.

Policy makers should concentrate on employment generation programmes in urban as well as rural areas; so that unemployment can be reduced and economic growth can be attained. Also, urbanization is negatively related with unemployment. So, by reducing the unemployment problem the urbanization can be achieved as well as economic growth can be attained.

REFERENCES

Bhattacharya B.B. & Sakthivel S. (2007) Economic Reforms and Jobless Growth in India.

Bhagat. R.B. & Mohanty. S. (2009). Emerging Pattern of Urbanization and the Contribution of Migration in Urban Growth in India. *Asian Population Studies 5*, 5-20.

Bhati, R.K. (2015). A Study of Rural to Urban Migration in India presented at ASM's International E-Journal Ongoing Research in Management and IT. Available online at: https://www.researchgate.net/piblication/331088765

Bhaumik, S.K. (2015). Principles of Econometrics A Modern Approach Using EViews Oxford University Press.

Ge X, Zhou Z, Zhou Y, Ye X, Liu S. (2018). A Spatial Panel Data Analysis of Economic Growth Urbanization, and NO_x Emissions in China. *Int J Environ Res Public Health, 15*, 725.

Ghose. A. (2014). India Needs Rapid Manufacturing LED Growth. Available online at: http://www.ihdindia.org/Working%20Ppaers/2015/WP-0115.pdf

Keyfitz, N & Philipov, D (1981). Migration and Natural Increase in the Growth of Cities Geographical Analysis. Available online at: www.researchgate.net.in

Kundu, A (2003). Urbanization and Urban Governance Search for Perspective beyond Neo-Liberalization. *EPW, 38*, 3079-3087.

Exclusionary Urbanization in Asia a Macro Overview (2009). *EPW, 44*, 48-58

Kumar, D. & Sinha, R (2018). Migration and India's Urban Transformation Consequences and Challenges. *The Indian Economic Journal, 18*, 172-189

Levine, L. (2013). Economic Growth and the Unemployment Rate, Congressional Research Service Report for Congress. Available online at: www.crs.gov

Mathur, V. K. & Stein, S.H. (1993). The Role of Amenities in a General Equilibrium Model of Regional Migration and Growth. *Sothern Economic Journal, l59*, 394-409.

Nair, S (2020). A Study on the Causes and Impact of Unemployment of India. *International Review of Business Economics*.

Padder, A.H. & Mathavan, B (2021). The Relationship between Unemployment and Economic Growth in India Granger Causality Approach. *Not. Volatiles & Essent. Oils, 8*, 1265-1271.

Prakash B. A & Abraham M.P. (2008). Trends and Characteristics of Unemployment in India in B. A. Prakash(eds.), The Indian Economy Economic Reforms & Performance, Pearson Education.

Parvathamma G. L. (2014). An Assessment on Status of Employment During Pre And Post Reforms Era in India. *BEST International Journal of Humanities, Arts, Medicine and Sciences (BEST IJHAMS), 2*, 87-94.

Reddy D. Narasimha (2012). Globalization, Labor and Employment in India. Available online at: http://works.bepress.com/narasimha_reddy/8

Roy S., Pal M.K. & Ray. I.A. (2012). Assessing Causal relationship between Education and Economic Growth in India. *Vidyasagar University Journal of Economics, 16*, 41-61

Sivaramakrishnan K.C., Kundu. A & Singh. B.N. (2007). Handbook of Urbanization in India. Singapore Oxford University Press.

Zhao Y. & Wang S. (2015), "The Relationship between Urbanization, Economic Growth and Energy Consumption in China: An Econometric Perspective Analysis. Sustainability. Available online at: www.mdpi.com/journal/sustainability