Economic growth, structural changes and employment linkages in India

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Abstract

Purpose – India started economic reforms at a rapid pace to catch up the world economy by following the services-led-growth model during the post-liberalisation period. Over the years, the growing unemployment rate posits a re-look into the dynamics of growth model for wider work force participation. In this backdrop, the paper aims to examine the dynamics of structural changes in employment pattern in view of economic growth led by services-led growth model in India.

Design/methodology/approach – The study employs a non-linear autoregressive model (NARDL) to examine the effect of the growth rates in three broad economic sectors namely agriculture and allied, services and industry on work force participation representing the employment opportunities in India.

Findings – The results highlight that the rapid expansion of the service sector has not occurred with enough employment opportunities by the same rate. By contrast, the growth in the industrial sector significantly creates employment opportunities in the short and long run. These results support the industry led growth model over the services for sustainable and inclusive economic growth in the country.

Research limitations/implications – The study relies on combined labour force participation rates rather than gender-specific rates. Further, the regulatory, working conditions and economic incentives may affect the gender-specific engagement of the labour force in three broad sectors.

Practical implications – The results offer important insight into changing patterns in employment with policy lessons. A wider workforce force participation calls for expansion of manufacturing activities through pro-industry programmes.

Originality/value – The study makes pioneer efforts to examine the dynamics of labour force participation with respect to the growth of three broad economic sectors of the Indian economy. The results provide new insights with policy implications for the changing employment pattern and policy response.

Keywords Service sector, Labour force participation, Make-in-India, Economic growth, Bound test

Paper type Research paper

1. Introduction

India has reported an impressive economic growth rate in the last decades and is commonly placed with China as the two Asian fastest emerging economies of the 21st Century (see Chandrasekhar and Ghosh, 2007; World Economic Outlook, 2023). Following the services-led-growth model, India has directed its policies for diversification of economic activities from traditional agriculture to services in the last decades. As a result, the service sector has reported unprecedented growth across the services in the post-reform period in

India. The services like business services-computer related services, machinery rental, research, legal and technical services, communication services (IT-enabled services) and banking services (banking and insurance) are the fastest-growing among the others. By contrast, the services-led economic growth has increased the national income to a similar level of the developed country, but the per capita income and growth in employment remain substantially low. Exports in services are competitive in only a few services and are concentrated in a few markets. The welfare gain of high tradable services remains skewed to urban centres in India. Most of the poor in India do not have access to basic services such as healthcare and education, and infrastructure which makes the cost of service delivery high to them (see, Mukherjee, 2013; Fan *et al.*, 2023). For example, the study of Hansda (2001) and Mitra (2011) posits the rising output and trade in services has triggered the economic growth in India, but this pattern of growth has been found less inclusive in terms of employment participation. Similarly, Bairagya (2012) shows that the formal sector has been a coveted destination for employment in India for a long time. However, it fails to absorb the growing workforce resulting in heavy use of technology and other automation adoption. To realise the maximum potential from high growth of services, India should make investment in social services like education, entrepreneurship for wider social development, high tech services like technology, modern means of communication and transportation for faster delivery of services (see, Singh, 2012).

This paper offers the argument that India and China have posited a common success story of high economic growth rate over the last years, but face different challenges especially on the labour market front. India and China were at a similar stage of development with relatively high per capita income in India in the 1990s. In the process of development, China has followed the model of mass industrialisation, while India has focused on service sector-led growth by reducing the role of Agriculture and allied (AS) activities which have been the largest source of employment in the country. As of now, India reports a substantially smaller economic size in terms of gross domestic product (GDP) output, per capita income, employment generation and poverty reduction than that of China. Another major difference between the two economies owes to the foreign trade pattern involving the trade compositions, volumes and export growth rates. Contrary to China, the traditional labour-intensive and intermediate goods dominate in the export basket of India.
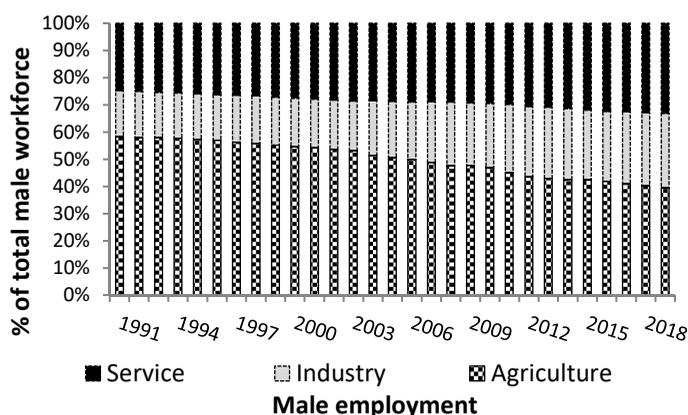
As of now, India is facing the growing pressure of a high unemployment rate despite doubling its GDP in the last decades. The growing unemployment clearly shows the policy failure in the redistribution of the workforce from one sector to another in the development process. Acknowledging the role of the industrial sector (IS) in sustainable economic growth and employment, the Indian Prime Minister started the campaign "Make-in- India" in September 2014 aiming to see India as a manufacturing hub in a similar line to China. In this backdrop, this study presents the fact that vast growth in the service sector has not occurred with the wider engagement of the workforce in India. Contrarily, the results highlight that the growth in the IS significantly contributes to workforce participation through creating additional employment opportunities.

1.1 Sectoral growth and workforce distribution
In India the agriculture and allied was the dominant sector among the others in the economy with the largest share in employment and GDP of the country during the 1980s (see, Joshi, 2004; Pattanaik and Nayak, 2010). The sectoral share of agriculture and allied output in national income which was over 60% during the 1950s has shown a consistent downward trajectory with over 18% share in 2019. By contrast, the share in employment continues to be highest with over 43% in 2018, indicating a worrisome situation related to prevalent disguised employment with low productivity.

Whereas, the industry share in national income shows a marginal rise to 32% in 2018 as compared to 29% in 1990. Whereas, the share of services has increased unprecedentedly in national income in last decades with over 55% in 2018, by contrast providing employment to over 32% of the total workforce after the agriculture sector. This highlights the fact that the growth rate in the output of services does not grow proportionally to the employment opportunities in India. As a result, the per capita income of the workforce employed in the service sector is higher than that of the workforce employed in other two sectors.

The sectoral distribution of workforce (both male and female) along with growth trajectories in three broad sectors agriculture and allied (AS), services and industry (IS) in India are shown in Figure 1. It is noted that agriculture and allied has been the highest source of employment for male and female, however, it shows downward trends over the years with a marginal shift of workforce to other sectors. The IS employs double male workforce than the females. The male workforce is found rising over the years in the IS as compared to females. The service sector which employed 12.48% of females in 1991, has gone up more than double

Source(s): Data is compiled from Work Bank development indicators

with over 28% as of now. Overall, the service sector was the source of employment for 24.83%, which has gone up marginally to 33% during the same period. The services like wholesale, retail trade, hotels and restaurants and community, social and personal services are the source of over 75% of employment. These services engage largely unskilled forces with low productivity. By contrast, the high productivity services like transport, information technology (IT) enabled services, financing, insurance, real estate and business services which contribute about 40% of the total service sector output provide employment to the relatively low workforce, hence unable to create employment opportunities in the same ratio (see, Pattanaik and Nayak, 2010; Eichengreen and Gupta, 2011; Aggarwal, 2018).

Figure 2 highlights the growth trajectories in labour force participation rate (LPR) over the period in India. The LPR is defined as the proportion of the population (ages 15–64) those either already engaged in employment or actively looking for employment. It represents all those people who are engaged in employment or willing to supply labour for the production of goods and services during a specific period (see, World Development Indicators, 2020). Overall LPR in India was found stable till 2005, however, a marginal rise can be observed in recent decades. By gender, the LPR of males was stable till 2005, and thereafter shows a decline of 6.97% during the period 1991–2019. Likewise, the LPR of females was stable till 2005, and then showed a decline of 9.66% during the same period. Thus, the decline in overall LPR could be attributed to the faster decline of the female workforce than that of the male workforce. The prominent reasons attributed to shift away of females from agriculture to non-agriculture activities due to contraction of agriculture sector, and secondly the rising demand for more educated workforce in industry and services than that of unskilled workforce (see, Rustagi, 2013; Mehrotra and Parida, 2017). The females which are withdrawing from the agriculture sector are primarily unskilled, resulting in are not fully absorbed by the industry or service sectors because of some skill set requirements (see, Bhalla and Kaur, 2011).

Among the others, the deceleration in overall LPR owes to low population growth rate and increasing demand for higher education among the younger age population for better career options (see, Venkatanarayana and Naik, 2013). The younger population is either withdrawing from the active labour force or postponing their entry into the labour market for the sake of higher education. Hence, the scopes to accelerate the overall LPR rate through the adult males are limited which seems to be already saturated.
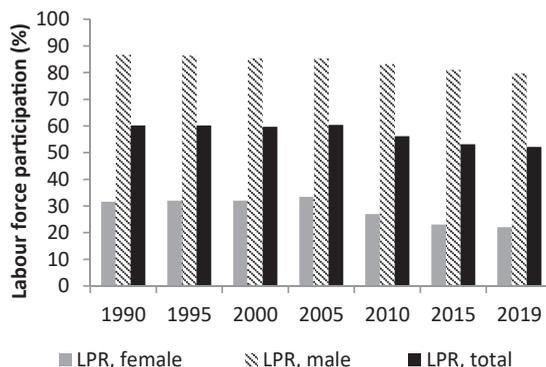

Figure 2.
Labour force (male and female) participation

Source(s): Data is compiled from Work Bank development indicators

2. Data and methodology

2.1 Data description

To examine the effect of the growth rates of all for three broad sectors – AS, IS and Services (SS) on the employment opportunities in India, we use the Gross Value Added (GVA, in US$ at the current rate) of all the three sectors as the independent variables. The GVA represents the net output of a specific sector after adding up all outputs and subtracting intermediate inputs. For example, agriculture and allied activities include cultivation of crops, forestry, hunting, and fishing and livestock production. Services include commercial activities in wholesale and retail trade (including hotels and restaurants), transport, and government, financial, professional and personal services such as education, health care and real estate services. Similarly, the IS includes manufacturing, construction, electricity, water and gas. To obtain the relative shares (%), the nominal GVA for all sectors is divided by the nominal GDP of the country. Following the existing empirical studies on changing employment pattern in India, we have used LPR as the proxy of employment opportunities in the country (see, Bhalla and Kaur, 2011; Dev and Venkatanarayana, 2011; Mehrotra and Parida, 2017; Roy and Barua, 2023; Rustagi, 2013). It is used as the dependent variable to examine the effects of growth in sectoral output on employment growth.

The annual data has been extracted from the online database as maintained by the World Bank for the period 1990–2019 (see, http://databank.worldbank.org). Following the Sbia *et al.* (2014) and Shahbaz *et al.* (2017), the annual data of all underlying variables are converted into quarterly observations by following the linear-sum-method. Thus the quarterly observations for all underlying variables are used in the study for the period 1990:Q12019:Q4 with the objective to increase the accuracy of empirical methods. Table 1 shows the summary statistics of the variables in question. The present study investigates the hypothesis of long-run cointegration between LPR and the relative shares of GVA of SS, IS and AS in the country as shown in equation (1).

$$y_t = \alpha_0 + \alpha_1 x_{it} + \varepsilon_{it} \tag{1}$$

Here, y_t stands for LPR for the country, x_{it} is GVA (% of GDP) for three broad sectors SS, IS and AS, respectively, ε_{it} is error term with zero mean and constant variance.

2.2 Model specification

The economic variables progress disproportionately under the different economic environments; hence exogenous variables exert asymmetric impact on the dependent variables. Given that, the standard autoregressive distributed lag (ARDL) framework as proposed by Pesaran *et al.* (2001) and other cointegration techniques which presume the symmetric relationship between the variables, fail to capture the potential asymmetric relationship which may exist between the variables. In this backdrop, the present study

	LFP	SS	IS	AS
Mean	57.69	46.57	31.17	22.26
Median	59.72	47.30	30.63	19.83
Maximum	60.42	55.50	34.53	30.76
Minimum	52.10	38.57	28.00	15.87
Std. Dev	3.02	4.71	1.59	4.86
Skewness	−0.74	−0.12	0.63	0.52
Kurtosis	1.85	1.99	2.31	1.68
Source(s): Author's own table				

Table 1.
Summary statistics

employs non-linear autoregressive distributed lag (NARDL) model as proposed by Shin *et al.* (2014) that presumes nonlinear or asymmetric linkages between the variables. The NARDL is an asymmetric extension to the standard ARDL that offers to capture the short and long asymmetric impact of exogenous variables while keeping the standard merits of ARDL. As of now, the ARDL technique is widely used by the researchers in examining the economic problem in the multivariate framework (see, Ghatak and Siddiki, 2001; Hye *et al.*, 2013; Kumar, 2020).

To begin with, the long-run equation (1) to be estimated can be extended to an asymmetric equation representing the asymmetric impact of the exogenous variable on the dependent variable as shown below:

$$y_t = \alpha_0 + \alpha_1 x_t^+ + \alpha_2 x_t^- + \varepsilon_{it} \tag{2}$$

where x_t^+ and x_t^- indicates the positive and negative shocks of the independent variable on the dependent variable, representing the asymmetric or non-linear impact. For the purpose, the independent variables are decomposed into their positive and negative partial sums for measuring positive and negative shocks as follow:

$$x_t^+ = \sum_{j=1}^{t} \Delta x_j^+ = \sum_{j=1}^{t} \max(\Delta x_j, 0) \tag{3}$$

$$x_t^- = \sum_{j=1}^{t} \Delta x_j^- = \sum_{j=1}^{t} \min(\Delta x_j, 0) \tag{4}$$

where x_t represents independent variables i.e. the growth in GVA of AS, IS and SS. Given that, x_t^+ is partial sum of positive shocks i.e. rise in output of AS, IS and SS ; x_t^- is partial sum of negative shocks i.e. fall in output of AS, IS and SS. Acknowledging the asymmetric impact of independent variables on dependent variable, the present study employs the NARDL model can be written as:

$$\Delta y_t = \alpha_0 + \gamma_0 y_{t-1} + \gamma_1 x_{t-1}^+ + \gamma_2 x_{t-1}^- + \sum_{k=1}^{p} a_{1,t-k} \Delta y_{t-k} + \sum_{k=0}^{p} a_{2,t-k} \Delta x_{t-k}^+ + \sum_{k=0}^{p} a_{3,t-k} \Delta x_{t-k}^- + u_t \tag{5}$$

where, γ_i denotes long run coefficients, $\propto_i$ denotes short run coefficients, Δ denotes first difference operator, μ_t while is error term with normally distribution. The optimal leg lengths $(p = 1, 2, \ldots .n)$ for the sample variables are determined on the basis of minimum Akaike information criterion (AIC).

To begin with the test of asymmetric long-run cointegration, Shin *et al.* (2014) proposes the bound test. It is tested by computing the Wald F-statistics for all lagged and current levels of the regressors. The Wald F-statistic tests the null hypothesis of non-significant asymmetric relationship between the variables, symbolically written as $\gamma_0 = \gamma_1 = \gamma_2 = 0$ against alternative hypothesis of significant asymmetric relationship between the variables, symbolically written as $\gamma_0 \neq \gamma_1 \neq \gamma_2 \neq 0$.

The NARDL procedure runs in two stages. The first stage involves the estimation of asymmetric long-run cointegrating relationships among the variables under the bound test. To determine the long-run cointegration, the computed F-statistic is compared with the bound critical values as proposed by Pesaran *et al.* (2001). If Wald F-statistics is greater than the upper bound value, it shows that a long-run relationship exists between the variables. By contrast, if F-statistic is less than the lower bound value, it provides a nonsignificant long-run relationship. Otherwise, the results are inconclusive.

3. Empirical results

3.1 Sectoral growth and employment linkages: long run integration

The Wald F-statistic is estimated by restricting the maximum lag length to equal to 3, while estimating equation (1). Subsequently, the optimal lag lengths for sample variables are selected on the basis of minimum AIC. Turning to the results of the bound test, the Wald F–statistic for Agriculture and allied sector is $F(LPR/AS) = 2.71$, for IS is $F(LPR/IS) = 6.86$, and for Service sector is $F(LPR/SS) = 6.38$. The relevant upper bound critical value is 6.36 and the lower bound critical value is 5.15 at a 1% level of significance (see, Pesaran *et al.*, 2001). The results confirm the long run linkages between the changing sectoral contribution of three broad sectors in the national income and the pattern of sectoral employment contribution (see, Ghose, 2015; Talreja and Dasgupta, 2022).

It is noted from the results, the Wald F-statistic for AS is less than the lower bound critical value, highlighting the acceptance of the null hypothesis of non-long run cointegration between LPR and growth in the AS. This shows that the AS has no long-run impact on the growth of employment opportunities in India. The GVA share of the AS has declined by over 20% in national income since 1990, while the sectoral contribution in employment share has decreased by over 14% during the same period. The AS still continues to be the largest employment provider in the country. These numbers highlight the disproportional relationship between agriculture output and employment; hence signifies that a substantial shift in the workforce could not take place from agriculture to services because of any tangible policy (see, Verma, 2008). Among the others, the principal reasons are the existence of disguised employment, where people think they are employed. Secondly, unskilled workforce in the agriculture sector find less opportunities for them in services and industry where semi-skilled or fully skilled workforce are needed.

The Wald F-statistic for SS is found higher than the upper critical value, highlighting the significant long-run cointegration between growth in output of services and growth in employment opportunities during the last decades. The cointegration exists because of the fact that the share of SS in national income has grown from 38.57% in 1990 to 55.50% in 2019, while the employment shares have grown disproportionately from 21.72% to 32.04% during the same period.

The significant value of Wald F-statistics for the SS and IS shows that the long-run growth in LPR significantly cointegrated with the growth in the Services and IS in India. It is noted from Figure 1, that the sectoral employment shares in IS and SS have gone up with the rising shares of these sectors in national income.

It is noted that the sectoral employment shares of IS have grown by 10% from 15.72% in 1990 to 25.58% in 2019. By contrast, the output share of IS in national income has declined from 31.03% to 28.0% during the same period. The results are consistent with the statistics as reported in section 1.1.

3.2 Sectoral growth and employment linkages: short-and- long run casualty

Having confirmed the long-run cointegration, the next step is to estimate the short and long-run impact of growth in sectoral shares of the SS and IS on the growth in LPR with error correction term (ECT) as shown in equation (5). The ECT shows the speed of adjustment of the dependent variable to the equilibrium level following the deviation of the independent variable (see, Pesaran *et al.*, 2001). It also estimates the joint impact of the short- and- the long-run impact of independent variables on the dependent variable.

Table 2 summarises the results for the short and long-run impact of growth in the IS on LPR in the country. It is noted that growth in the IS has a significant positive impact on the LPR irrespective of positive or negative shocks in the growth of the IS in the long run. Hence, it highlights the linear or symmetric integration between the growth of IS and LPR in the

Long run coefficients		Short run coefficients	
IS_t^+	3.123*	Constant	−0.281***
	(0.075)		(0.000)
IS_t^-	3.362**	ΔLFP_{t-1}	0.752***
	(0.020)		(0.000)
		ΔIS_t^+	−0.091***
			(0.000)
		ΔIS_{t-1}^+	0.097***
			(0.000)
		ECT_{t-1}	−0.005***
			(0.000)

Note(s): R square: 0.924
F-statistics: 334.20*** (0.000)
AIC: −4.386
Probability values in the bracket
**,* indicates significant at 5 and 10 percent level of significance
Source(s): Author's own table

Table 2.
Industrial sector
impact on labour
employment

short and long run. This relationship shows that the IS creates employment opportunities irrespective of positive or negative growth rate in industrial activities. It highlights that employment engagement has increased over the years in industry irrespective of positive or negative growth rates. While the positive shocks in the growth rate of the IS account for the immediate negative impact on LPR in the short run, however, the impact of shocks turns positive over the period of time.

The manufacturing sector has not responded in the same manner towards the economic reforms in generating output in national income as responded by the service sector during the post-reform period. It is argued that trade liberalisation has favourably affected the unregistered sector more than the registered sector. The reforms in the 1980s involving industrial de-licencing and deregulation were categorised as pro-business. By contrast, the reforms in the 1990s were pro-market, hence the focus was to integrate the Indian market with the global market (see, Ghosh and Veeramani, 2014). Other reasons for the poor performance of the manufacturing sector were competition from the international producers and the availability of cheaper products in the international markets. As a result, Indian manufacturers have faced competition in both domestic and external markets from other countries due to the availability of cheaper products specially imported from China (see, Banga, 2014).

The ECT coefficient is significantly negative, highlighting that a 10% rise in the share of Industry in national income leads to a 0.05% increase in the LPR in the country. In fact, the share of employment in the formal IS has declined over the years, whereas the growth in employment in the informal sector which comes to be a major source of employment of the total manufacturing sector has increased over the years (see, Ghosh Dastidar, 2015).

Table 3 reports the results for the short-and- the long-run impact of growth in SS on the overall LPR in the country. It is noted that the positive shocks in the growth of SS in national income have no significant long-run impact on the growth in LPR in the country, while the negative shocks account for the positive impact on the growth in LPR in the short and long run. This relationship exists because of disproportional growth in output of services and growth in employment opportunities over the years. The output of services has grown manifold while the employment opportunities have not grown to the same extent. It is noted that the share of SS in national income has grown by about 17% during the 1990 and 2019, while the employment shares have grown by about 10% during the same period. This shows that the growth in SS has not occurred with the expansion of employment opportunities in the

Long run coefficients		Short run coefficients	
SS_t^+	1.218	Constant	0.221***
	(0.174)		(0.000)
SS_t^-	18.751*	ΔLFP_{t-1}	0.778***
	(0.057)		(0.000)
		ΔSS_t^-	0.331***
			(0.000)
		ΔIS_{t-1}^-	−0.269
			(0.002)
		ECT_{t-1}	−0.004***
			(0.000)

Note(s): R square: 0.925
F-statistics: 331.97*** (0.000)
AIC: −4.382
Probability values in the bracket
***,* indicates significant at 1 and 10 percent level of significance
Source(s): Author's own table

Table 3.
Service sector impact
on labour employment

country. For example, the study of Sen (2011) shows that a unit rise in trade, hotels and restaurants, transport, storage and communications services leads to 0.484 units rise in services output, while a unit increase in community, social and personal services leads to 0.272 units rise in services output. By contrast, India is a major exporter of services, its export competitiveness concentrates in few sectors and a few markets (see, Mukherjee, 2015).

It is noted that the ECT coefficient is significantly negative, highlighting that a 10% rise in the share of SS in national income leads to a 0.04% increase in the LPR in the country. Contrary to the study of Park and Shin (2012) which supports the argument that due to the rapid expansion of commercial services, the employment share of the service sector tends to increase more rapidly than the share of the IS. These results clearly highlight the major role of the IS in employment creation more than that of SS in spite of the decline of the IS share in national income.

For sustainable growth in employment, services-led growth requires to be aligned with industrial and agricultural policy for the wider gain. The bundling of services with manufactures is essential for long term gain (see, Yusuf, 2015). The results are consistent with the other studies supporting the arguments that the manufacturing sector is the main destination for the majority of the workforce with varying skill sets, while services provide employment to a relatively highly skilled workforce (see, Banga, 2006; Eichengreen and Gupta, 2011; Ramaswamy and Agrawal, 2012; Ghose, 2015; Talreja and Dasgupta, 2022).

3.3 Diagnostic testing
The paper conducts two different tests for using the best fit models with the variables in question. *First,* the correlations between the residuals are estimated. They are found nonsignificant highlighting the normal distribution of residuals. *Second*, the cumulative sum of recursive residuals (CUSUM) test as proposed by Pesaran *et al.* (2001) is also applied for testing the stability of the coefficients. The coefficients for all models are found within the two bounds. It indicates the so obtained coefficients are stable with given lag lengths.

4. Summary
India has reported primarily services led economic growth while the output shares of other two sectors (IS and AS) have declined consistently in the last decades. The growing gap

between the growth in national output and growth in unemployment poses challenges to the policymakers to revisit the growth model for India. The results of the present study offer policy lessons to policymakers highlighting the urgent need to revisit the major economic policies for the country focussing on inclusive economic growth which occurs with sustainable employment opportunities.

It is found that the services-led growth model being followed by India fails to enhance the work force participation at the desired level. The employment opportunities have not occurred with the growth in the share of services in national income. Contrarily, the IS has reported a rise in engaged workforce in spite of the decline in the sectoral share in national income. As of now, the AS stands as the largest employer to the workforce despite the consistent falling of sectoral share in national income. It is noted that the employment shares of the agricultural and allied are also consistently declining due to shifting of workforce to other sectors.

Further it is noted that the male workforce participation rate of India stands close to China, however, the female workforce participation rate is found very low. Overall, female workforce participation has shown declining trends over the period, however, their employment engagement in the service sector have shown upward trends.

4.1 Policy implication

The declining of adult females' workforce participation rate due to shifting from the agriculture sector to other activities require a shift in policy framework for their rehabilitation. The unskilled workforce which is withdrawing from the agriculture sector requires up-skilling for their wider participation in IS and SS. For enhancing the overall workforce participation in services, the high end and skill intensive services need to be integrated with manufacturing and agriculture sectors for meaningful gain in employment opportunities.

For the growth of the IS, initiatives like make-in-india have greater relevance in the current scenario which has the potential to make India a manufacturing hub. Similarly, campaigns like Aatm-nir-bhar Bharat (self-reliance India) which was introduced during COVID-19 pandemic to reduce the dependency on imports has the scope to boost the IS. The micro, small and medium enterprises (MSMEs) which provide largest employment especially to the unskilled workforce requires a comprehensive package in terms of policy framework. Overall the results point out towards a greater need for strengthening the policy framework for growth of the IS in the country.

References

Aggarwal, A. (2018), "Economic growth, structural change and productive employment linkages in India: did market transition matter?", *South Asia Economic Journal*, Vol. 19 No. 1, pp. 64-85, doi: 10.1177/1391561418761074.

Bairagya, I. (2012), "Employment in India's informal sector: size, patterns, growth and determinants", *Journal of the Asia Pacific Economy*, Vol. 17 No. 4, pp. 593-615, doi: 10.1080/13547860.2012.724548.

Banga, R. (2006), *Critical Issues in India's Services-Led Growth*, Asian Development Bank, Manila, INRM Policy Brief No. 2, available at: https://www.adb.org/sites/default/files/publication/29420/inrm2.pdf

Banga, R. (2014), "Hollowing-out of India's manufacturing sector: role of international trade", available at: http://www.esocialsciences.org

Bhalla, S. and Kaur, R. (2011), "Labour force participation of women in India: some facts, some queries", Asia Research Centre Working Paper 40, London school of Economics and Political science, London.

Chandrasekhar, C.P. and Ghosh, J. (2007), "Recent employment trends in India and China: an unfortunate convergence?", *The Indian Journal of Labour Economics*, Vol. 50 No. 3, pp. 383-404.

Dev, S.M. and Venkatanarayana, M. (2011), "Youth employment and unemployment in India", Working paper 009, Indira Gandhi Institute of Development Research, Mumbai, available at: http://www.igidr.ac.in/pdf/publication/WP-2011-009.pdf

Eichengreen, B. and Gupta, P. (2011), "The service sector as India's road to economic growth", Working Paper 16757, National Bureau Of Economic Research, Cambridge, MA.

Fan, T., Peters, M. and Zilibotti, F. (2023), *Growing like India: the Unequal Effects of Service-Led Growth*, National Bureau of Economic Research, Massachusetts Avenue Cambridge, MA, available at: http://www.nber.org/papers/w28551

Ghatak, S. and Siddiki, J. (2001), "The use of ARDL approach in estimating virtual exchange rates in India", *Journal of Applied Statistics*, Vol. 11 No. 5, pp. 573-583, doi: 10.1080/02664760120047906.

Ghose, A.K. (2015), "India needs rapid manufacturing-LED growth", Working paper NO. WP 01, Institute for Human Development, New Delhi, available at: http://www.ihdindia.org/Working%20Ppaers/2015/WP-0115.pdf

Ghosh Dastidar, S. (2015), "Manufacturing and trade liberalisation of India: continuing the debate", MPRA Paper No. 61907, available at: https://mpra.ub.uni-muenchen.de/61907/

Ghosh Dastidar, S. and Veeramani, C. (2014), "Does trade openness affect manufacturing growth at the Indian state level?", MPRA Working Paper No. 58876, available at: https://mpra.ub.uni-muenchen.de/58876/

Hansda, S. (2001), "Sustainability of services-led growth: an input-output analysis of the Indian economy", *Reserve Bank of India Occasional Papers*, Vol. 22 Nos 1-3, pp. 73-118.

Hye, Q.M.A., Wizarat, S. and Lau, W.Y. (2013), "Trade-led growth hypothesis: an empirical analysis of South Asian countries", *Economic Modelling*, Vol. 35, pp. 654-660, doi: 10.1016/j.econmod.2013.07.040.

Joshi, S. (2004), "Tertiary sector-driven growth in India", *Economic and Political Weekly*, Vol. 39 No. 37, pp. 4175-4178.

Kumar, R. (2020), "Does trade interdependency lead linkages between stock markets? A case of South Asian countries", *International Journal of Emerging Markets*, Vol. 15 No. 3, pp. 490-506, doi: 10.1108/ijoem-08-2018-0446.

Mehrotra, S. and Parida, J.K. (2017), "Why is the labour force participation of women declining in India?", *World Development*, Vol. 98, pp. 360-380, doi: 10.1016/j.worlddev.2017.05.003.

Mitra, A. (2011), "Trade in services: impact on employment in India", *The Social Science Journal*, Vol. 48 No. 1, pp. 72-92, doi: 10.1016/j.soscij.2010.07.014.

Mukherjee, A. (2013), "The service sector in India", Economics Working Paper Series No. 352, Asian Development Bank, Manila.

Mukherjee, A. (2015), "Services sector in India: trends, issues, and the way forward", *Eurasian Geography and Economics*, Vol. 56 No. 6, pp. 635-655, doi: 10.1080/15387216.2016.1151371.

Park, D. and Shin, K. (2012), "The service sector in Asia: is it an engine of growth?", Working Paper 322, Asian Development Bank, Manila.

Pattanaik, F. and Nayak, N.C. (2010), "Employment intensity of service sector in India: trends and determinants", *2010 International Conference on Business and Economics Research*, Kuala Lumpur.

Pesaran, M.H., Shin, Y. and Smith, R.J. (2001), "Bounds testing approaches to the analysis of level relationships", *Journal of Applied Econometrics*, Vol. 16 No. 3, pp. 289-326, doi: 10.1002/jae.616.

Ramaswamy, K.V. and Agrawal, T. (2012), "Services-led growth, employment and job quality: a study of manufacturing and service-sector in urban India", Working paper 7, Indira Gandhi Institute of Development Research, Mumbai.

Roy, P. and Barua, A. (2023), "Labour force participation among the elderly in India: what does the latest data show?", *International Journal of Social Economics*, Vol. 50 No. 4, pp. 592-605, doi: 10.1108/IJSE-06-2021-0350.

Rustagi, P. (2013), "Changing patterns of labour force participation and employment of women in India", *The Indian Journal of Labour Economics*, Vol. 56 No. 2, pp. 215-241.

Sbia, R., Shahbaz, M. and Hamdi, H. (2014), "A contribution of foreign direct investment, clean energy, trade openness, carbon emissions and economic growth to energy demand in UAE", *Economic Modelling*, Vol. 36, pp. 191-197, doi: 10.1016/j.econmod.2013.09.047.

Sen, C. (2011), "FDI in the service sector - propagator of growth for India?", *Theoretical and Applied Economics*, Vol. 18 No. 6, pp. 141-156.

Shahbaz, M., Hoang Thi Hong, V., Mahalik, M.K. and Roubaud, D. (2017), "Energy consumption, financial development and economic growth in India: new evidence from a nonlinear and asymmetric analysis", *Energy Economics*, Vol. 63, pp. 199-212, doi: 10.1016/j.eneco.2017.01.023.

Shin, Y., Yu, B. and Greenwood-Nimmo, M. (2014), "Modelling asymmetric cointegration and dynamic multiplier in a nonlinear ARDL framework", in Sickles, R.C. and Horrace, W.C. (Eds), *Festschrift in Honor of Peter Schmidt: Econometric Methods and Applications*, Springer, New York, pp. 281-314.

Singh, B. (2012), "Is the service-led growth of India sustainable?", *International Journal of Trade, Economics and Finance*, Vol. 3 No. 4, pp. 316-322, doi: 10.7763/ijtef.2012.v3.219.

Talreja, C. and Dasgupta, A. (2022), "Why services cannot be the engine of growth for India", *The Economic and Labour Relations Review*, Vol. 33 No. 3, pp. 629-653, doi: 10.1177/10353046221108807.

Venkatanarayana, M. and Naik, S.V. (2013), "Growth and structure of workforce in India: an analysis of census 2011 data", MPRA Paper No. 48003, available at: https://mpra.ub.uni-muenchen.de/48003/

Verma, R. (2008), "The service sector revolution in India-a quantitative analysis", Working Paper No. 72, UNU World Institute for Development Economics Research, Helsinki.

World Development Indicators (2020), available at: http://databank.worldbank.org/data/source/world-development-indicators

World Economic Outlook (2023), available at: https://www.imf.org/en/Publications/WEO

Yusuf, S. (2015), "The brave new world of services-led growth", *Eurasian Geography and Economics*, Vol. 56 No. 6, pp. 602-617, doi: 10.1080/15387216.2016.1158120.

Further reading

The World Economic Outlook (2020), available at: https://www.imf.org/external/datamapper/datasets/WEO.

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