DECLINING TREND OF GDP AND ROLE OF MANUFACTURING SECTOR WITH SPECIAL EMPHASIS ON LABOUR MARKET

By

Kaveya, P.

Research Scholar, Department of Economics, University College, Trivandrum, Kerala, India.

Abstract

This paper aims to study both the short term and the long-term fluctuations in the GDP growth pattern of Indian economy with special emphasis on labour market trends The study basically concentrates an analysis taking into account time periods ranging from 2015 to 2022 during the first three quarter. The empirical evidence reveals that the fixed effect model shows a positive effect between certain variable and a negative effect with one variable. This paper contributes to the literature field by making a comparative study on the performance of manufacturing sector with special emphasis on labour market functions considering its productivity trends. The results formulated have high potential usage for policy frame workers, Economists and investors.

Keywords: *balance payment, gross domestic product, national sample survey office, liberalisation privatisation, globalisation, indian standards institute, international fiscal associations, manufacturing, technology, gross fixed capital formation, labour force participation rate, annual survey, JEL Classification: B25, B27, B29.*

Introduction

The Gross Domestic Product of a particular country highly depend upon the scope and performance of it. Indian economy, second largest in population and seventh largest one in terms of productivity rather a developing economy has greatest share in the area of GDP contributions in service sector of a particular economy. The economy is divided basically into three sectors which includes primary, secondary and tertiary. During the phase of Independence, it was the agricultural sector which showed a progressive tendency in the area of agricultural contribution to GDP and also to the area of employment generation. However, as the economy moved from a normal collar approach rather to a stringent one, aiming for a white-collar job, the share of primary production units declined and that of industrial

and related areas developed. This was not a peculiar condition which applied to Indian economy alone. Progressive development in almost all sectors were witnessed when analysed the trend pattern of the economy from 1950 onwards.

The 1950-65 model popularly known as the MahalNobis plan aimed for a rapid intermediate goods and ISI capital. All measures were adopted for undertaking promotion in the area of development in financial and physical resource basin. This rapid trend showed remarked increase in the performance of the industrial sector which showed 7 per cent annual increase resulting in a BOP crisis in the economy. It was during the period from 1966-80 where massive levels of shocks and crises was witnessed in the economy. Import submitted fertilisers, self-sufficiency in food production was the basic objective of the period.1980 was the period of liberational creeping. Set up and initiation of public infrastructural investment, opening up of foreign capital and technological capital all were associated with rapid developmental concerns. Introduction of HYV seeds, poverty eradication

activities and massive levels of employment generation programme led to an accelerated growth rate of 5.5 per cent. However, it was from 1991 onwards remarkable improvement in the industrial sector was witnessed. The LPG policy broadened the area of operation of the industrial unit with massive level of globalisation and liberalisation. The main attraction of the policy was the reshaping of the economy with more of a privatisation perspective. Deregulation of economy, massive levels of private investment and mobilisation of trade and financial activities was its basic objectives.

Figure 1. GDP Growth (1987 2027 (estimated))
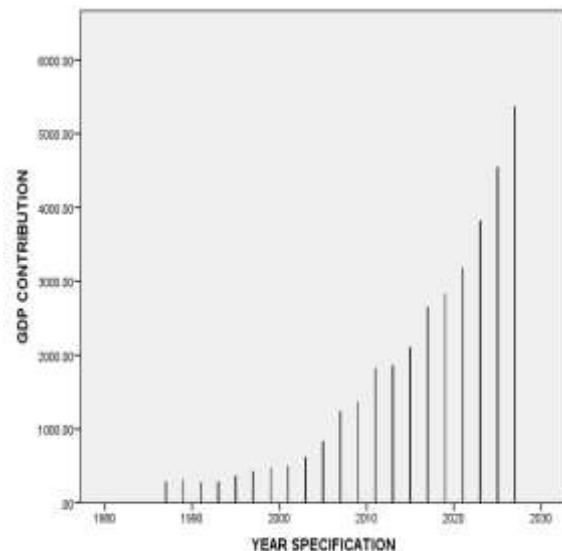
Source: Statista 2022

Figure 2. Manufacturing Sector and GDP Growth Rate
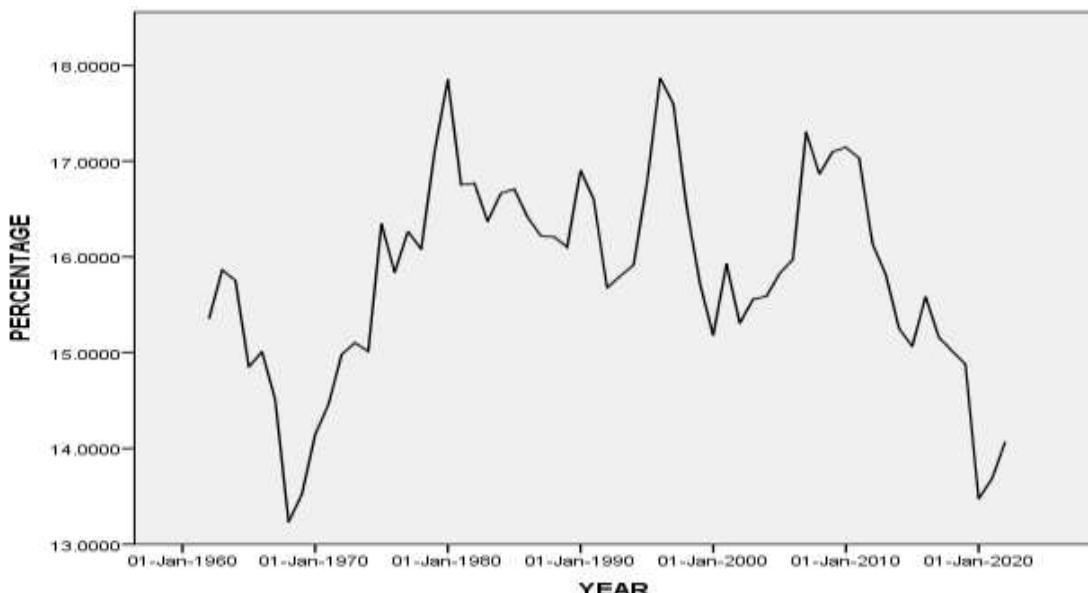

Source: World Bank

Manufacturing Sector

Manufacturing sector which belongs to the secondary sector of an economy by definition includes all activities of manufacturing, repair, processing and maintenance units irrespective of its investment, GDP growth and employment situation. The manufacturing sector basically is divided into two which includes: (1) unorganised and organised (2) Registered and unregistered. Registered manufacturing units is however considered same as that of organised one and the latter one as

unorganised. The organised manufacturing units includes those that are registered under the section 2m(i) and 2m(ii) of the Indian factories act (IFA) which refers to factories employing 10 or more workers .The unregistered manufacturing units includes processing, manufacturing and repairing services employing less than 10 workers. Out of all factors of production labour constitutes the most important factor in developing the performance of the manufacturing sector of an economy. However, the recent decades reveal a massive

decline in the total employment of labour force which shows divergence between the income generated in an economy and its creation of employment opportunities.

Figure 3. Share of unregistered manufacturing units to GDP
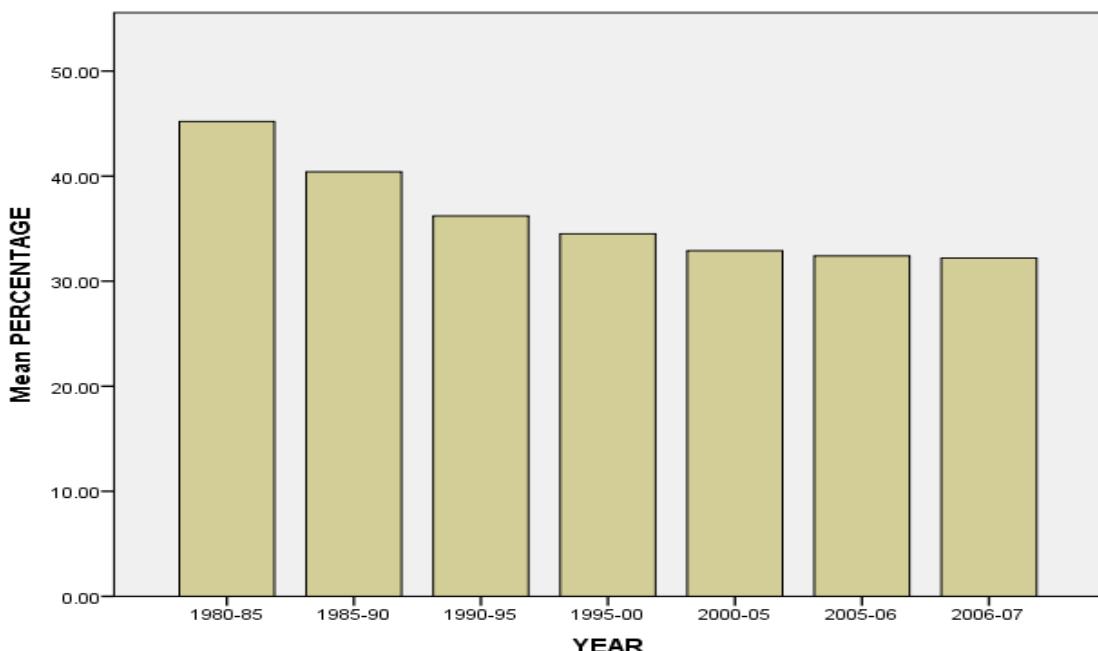
Source: CSO

The official publications of the CSO reports states that the contribution of the unorganised unit to the GDP growth conditions has showed a declining tendency where both socio economics and political situation leads to severe levels of distortions. Reports says that the total contribution of the employment generation in the field of manufacturing sector is around 80 per cent but lacks in proper generation of human capital formation. The ASI figures indicate that around 32 per cent of the income generated in the manufacturing unit is contributed by the unorganised sector. The literature revies also postulate that backward economies have more potentialities in creating employment positions in the unorganised sector rather than the developed ones.

The table below shows the mean value of employment generated in the unregistered sector ranging from a period of 1989-90 to 2005-06. The percentage contribution is however same on different year where as its cumulative percentage shows an added value of 25 per cent.

Table 1. Manufacturing sector employment as a total percent of employment in unorganised sector

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	78.20	1	25.0	25.0	25.0
	80.90	1	25.0	25.0	50.0
	81.20	1	25.0	25.0	75.0
	82.30	1	25.0	25.0	100.0
	Total	4	100.0	100.0	

Table 2. Year wise Frequency Distribution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1989-90	1	25.0	25.0	25.0
	1994-95	1	25.0	25.0	50.0
	2000-01	1	25.0	25.0	75.0
	2005-06	1	25.0	25.0	100.0
	Total	4	100.0	100.0	

Source: 45th, 51st, 56th and 62nd rounds of NSSO

Literature review postulates that the share of the organised sector in terms of its contribution to GDP and employment shows a comparative improvement. The table depicted shows this particular tendency over certain years.

Figure 4. Real output, real wage and real employment growth rate
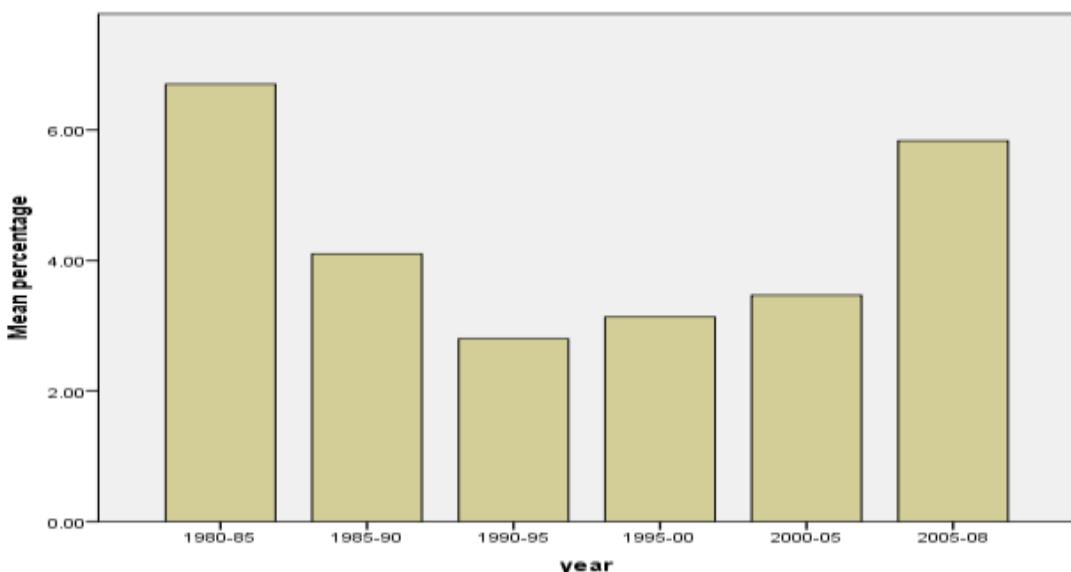

Source: ASI data

The figure drawn above explains the mean percentage contribution of organised sector together in the area of average rate of growth in real output, wages and emoluments. There has been a declining rate over years in terms of contribution of each of these factors which shows a progressive tendency in 2005-08. Many of the literature review which includes the one by Hashim postulate that it was with the initiation of the liberalisation policy much of the development phase was witnessed. The structural transformation that took place had resulted in massive levels of development in the area of employment contribution especially in the area of labour market and in the area of creation of job situations.

The comparison between the two sectors could however be formulated with the help of making a comparison on its labour productivity as envisaged by Goldar et al in their literatures. The researchers however in the related area postulates that the labour productivity in the unorganised sector has increased more than that of one in organised sector. The study by Golder et al postulates a comparison chart as depicted below:

Figure 5. Growth rate of real value generated to the manufacturing sector

Figure 6.2A: Growth Rate of Real Value Added in Indian Manufacturing Sector: 1989-90 to 2005-06

Source: https://www.rbi.org.in/scripts/PublicationsView.aspx?id=13366#62
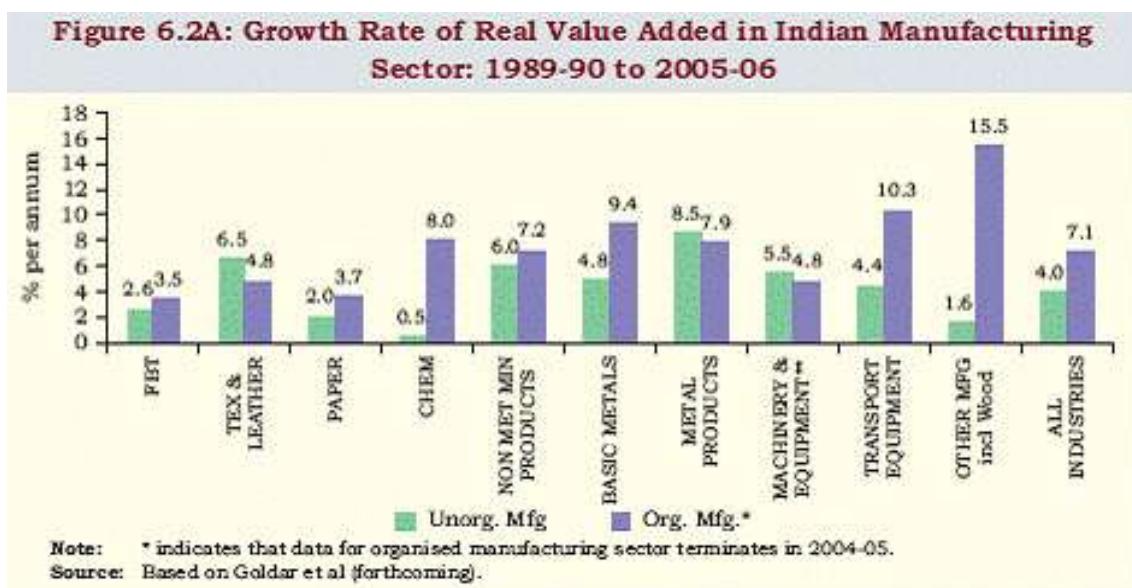
Figure 6. Growth rate of Employment in Indian manufacturing sector

Figure 6.2B: Growth Rate of Employment in Indian Manufacturing Sector: 1989-90 to 2005-06
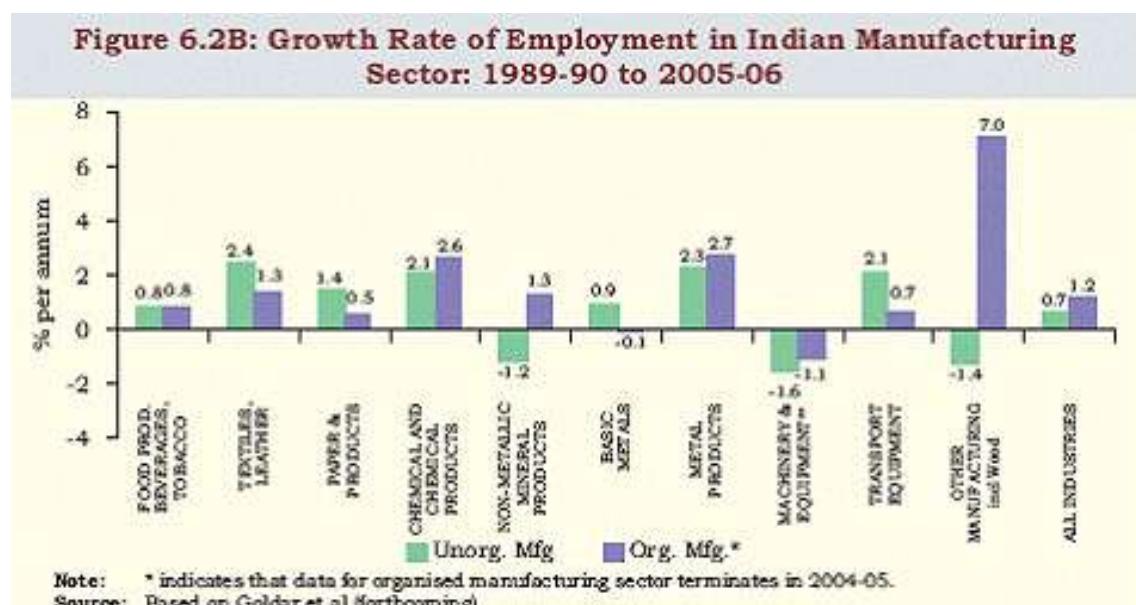
Figure 7. Increase in labour productivity from 1989-90 to 2005-06

Figure 6.2C: Growth Rate of Labour Productivity in Indian Manufacturing Sector: 1989-90 to 2005-06

Source: https://www.rbi.org.in/scripts/PublicationsView.aspx?id=13366#62
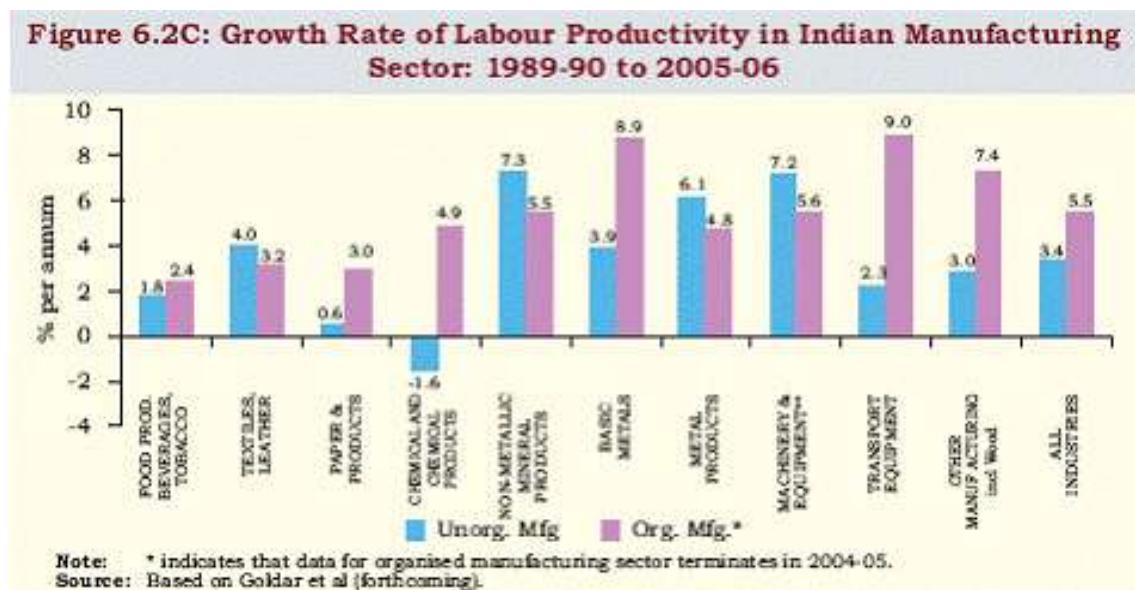
Literature Review

1. Krugman (1994) in his literature review postulate that productivity of labour has high and prime role in increasing the GDP contribution of an economy especially in the area manufacturing sector. The findings of the study postulates that it was due to the adoption of the modern technology that advancement in the productivity level occurred which led to massive developments in all fields of operation.

2. Kaldor and Naude and szirmai (2012) in their study explains that there was immense development in the area of manufacturing sector which occurred basically due to the quality improvement in the sector compared to other sectors of the economy. Tregenna (2007) argues that the improvement in the manufacturing sector has a spill over effect which lead to overall improvement in manufacturing sectors leading to massive levels of improvement in the economy.

3. Arrow (1962), Romer (1986), Jovanovic and Rousseau (2002), Boucekkine, del Rio, and Licandro

2003 claims in their study that the improvement and advancement in technological activity led to massive levels of investment in the economy, which lead to strong externalities of knowledge flow. The literature also postulates that during the middle-income period there was strong movement from manufacturing to service sector.

4. Par and Chan (1989) postulates that as the industrial sector progress it automatically leads to improvement in the service sector which explains the strong relationship between various sectors of the economy.

5. Krishna (1987) and Goldar and Mitra (2002) envisages the idea that total factor productivity plays an important role in mobilising industrial growth structure and improving the efficiency level of a business unit. This literature addresses `whether there has been an increase or decrease in Total Factor Productivity? Whether trade liberalisation had resulted in positive trends in the industrial structure and also what determines

the level of productivity concern in an industrial framework. The findings of the study includes that the potentiality and the growth structure of the industrial unit had largely been governed both by the economic, social and the political factor that exist by the intensive utilisation of resources in an established manner.

6. Many other studies conducted by ayadevan (1996), Mitra (1999), Unni et al (2001), Ray (2002), Sunil Kumar (2003), Aghion. (2003), Trivedi (2003), Mukherjee & Ray (2004), Trivedi (2004), Raj & Duraiswamy (2006), Raj and Mahapatra (2009), and Goldar and Mitra (2008) had formulated different labour related study and its impact on manufacturing sector which deals with and analyse the role and contribution of states towards improvement in labour productivity and prosperity.

7. Mohanty (1992) and unni (2001) in their literature on manufacturing sector explains and details the role of liberalisation on TFP of unorganised sector. The study finds

out the during a period from 1994-2005 there has been a decline in the productivity level of industrial sector under organised industrial framework.

Theoretical Literature Review

8. The paper published by Nicholas Kaldor 1966 which explains the reason for the poor economic growth of united Kingdoms poor economic growth, structural, empirical and rational study on labour market. The model gave high importance to manufacturing sector as it was considered as the building block of an economy. The main findings of the study claims that advanced studies in the post war era over a period from 1952-53 to 1963-64 shows that there exists a positive relationship between economic performance and productivity of a country.

9. The neoclassical growth theory where Solow is the main contributor considered technological advancement as an important factor in improving the productivity of a particular country. He in his work regard capital accumulation as an important factor in raising the overall productivity of an economy which he considers both labour and capital as important factors in the area of production.

Periodical Literature Review

10. The Hindu dated 1/12/2022 under an article titled "GDP growth DIPS to 6.3 per cent" explains that there has a declining trend in the GDP growth of an economy especially due to declining manufacturing sector. The study claims that the decreasing trend of Gross Value-Added growth to slower than 5.6 per cent along with high levels of inflation and weak exports. The April to June GDP figures explained that the GVA figures of agricultural sector increased to 4.6 per cent, manufacturing contracted to 4.5 per cent and mining to 4.3 per cent. Inflation targeting and major regulatory framework works to remove the rigidities but the effectiveness of the policy lies as a question to be discussed.

11. The Times of India dated November 30,2022 explains the pace of GDP

growth rate trends ranging from a period 2015 to 2023.The main findings of the study claims that there has been a declining trend in the agricultural and manufacturing sector where the GVA figures fall to 4.6 in second quarter and 3.2 in the third quarter. The manufacturing sector also showed a declining trend from 5.6 per cent to 4.3 percent. This automatically led to declining trend in GDP formation.

Objectives of the Study

1.To analyse the trend of GDP fluctuations in the economy

2.To understand the impact of manufacturing sector, infrastructural activities, labour force structure and technological factors on GDP growth of an economy.

Hypothesis of the Study

H1: There exists a positive influence of manufacturing sector on the GDP growth of a particular economy

H2: Physical and social infrastructure investment has a positive impact on GDP formation of a particular country

H3: Employment and labour force structure has an impact on GDP growth rate of an economy

H4: Technological factors highly influences the working of GDP of an economy

Methodology

Collection of Data

The collection of data for the paper was undertaken based on the pace of GDP growth on first quarter(Q1), second quarter(Q2) and third quarter(Q3) for a period ranging from 2015 to 2023.

Variables and Model

A normalisation of data has been undertaken under the study since there exists disparity among the data structure. Here as GDP is regarded as the dependent variable it is being considered as the regressand all other indicators are considered as regressors in the given model.

The equation in the model is represented hence as follows:

Model Specification

lnGDPit= β0+ β1lnMOPit+ β2lnGrFCFoit+ β3lnLRFit+ β4lnTECit+ uit

Where;

lnGDPit =Gross domestic product of ith country in time 't'

MOP**it**=Manufacturing sectors output of ith country in time't'

GrFCF**o**=Gross fixed capital formation of ith country in time 't'

LRF**it**=Labour force participation of ith country in time 't'

TEC **it**=Technological development of ith country in time 't'

Descriptive Analysis

Uit=Stochastic error

Data Analysis and Results

The study basically analysis the descriptive statistics of the model. Correlation analysis and VIF test are performed to analyse the relation among the variables. Multicollinearity analysis and unit root test analyses are formulated to identify the whether there is stationarity among the variables. Ordinary Least Square method are formulated in order to identify the connection between dependent and independent variable.

Statistics						
		GDP	MOP	GrFC	LRF	TEC
N	Valid	8	8	8	8	8
	Missing	0	0	0	0	0
Mean		5.2375	5.5750	8.5125	47.8088	11.3750
Median		6.6500	7.7000	8.1500	48.2200	10.0000
Std. Deviation		5.04379	7.03029	10.99252	1.69728	6.06954
Minimum		-6.60	-7.20	-10.40	44.92	3.00
Maximum		8.90	13.10	28.30	49.79	21.00

Correlation Analysis

Correlations		GDP	MOP	GrFC	TEC	LRF
GDP	Pearson Correlation	1	.366	.707*	.519	.620
	Sig. (2-tailed)		.372	.050	.188	.101
	N	8	8	8	8	8
MOP	Pearson Correlation	.366	1	.390	-.017	.863**
	Sig. (2-tailed)	.372		.340	.967	.006
	N	8	8	8	8	8
GrFC	Pearson Correlation	.707*	.390	1	.368	.340
	Sig. (2-tailed)	.050	.340		.370	.411
	N	8	8	8	8	8
TEC	Pearson Correlation	.519	-.017	.368	1	-.029
	Sig. (2-tailed)	.188	.967	.370		.947
	N	8	8	8	8	8
LRF	Pearson Correlation	.620	.863**	.340	-.029	1
	Sig. (2-tailed)	.101	.006	.411	.947	
	N	8	8	8	8	8
*. Correlation is significant at the 0.05 level (2-tailed).						
**. Correlation is significant at the 0.01 level (2-tailed).						

The analysis of the data is basically undertaken with the help of Karl Pearson's correlation coefficient. The result postulate that the correlation among the dependent and the independent variable is significant. The result postulate that the relation between GDP and MOP is significant. GDP and GRFC relation is positive, Technology and GDP is positively related and on the same way LRF is also positively related. Highest relation takes place among GrFC AND GDP.

Multicollinearity

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
Coefficientsa								
Model		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-167.124	28.081		-5.952	.009		
	MOP	-.617	.148	-.860	-4.154	.025	.244	4.106
	GrFC	.232	.056	.505	4.160	.025	.707	1.414
	LRF	3.566	.601	1.200	5.935	.010	.255	3.919
	TEC	.293	.093	.352	3.147	.051	.833	1.200

a. Dependent Variable: GDP

The table represents that VIF for some variables are greater than 1 whereas for tolerance it is less than 1. So, we could say that there exists some amount of multicollinearity.

Unit Root Test

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic – based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		–2.396054...	0.17284...
Test critical values:	1% level	–4.803491681666216	
	5% level	–3.403313236991566	
	10% level	–2.841818778689028	

*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
    and may not be accurate for a sample size of 7

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP)
Method: Least Squares
Date: 12/06/22   Time: 14:55
Sample (adjusted): 2016 2022
Included observations: 7 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDP(-1)	–1.04754...	0.4371964...	–2.396054...	0.06192...
C	5.084666...	3.1258780...	1.6266360...	0.16474...

R-squared	0.534497...	Mean dependent var	0.428571428571428
Adjusted R-squared	0.441396...	S.D. dependent var	7.77715419251154
S.E. of regression	5.813045...	Akaike info criterion	6.59304256748359
Sum squared resid	168.9574...	Schwarz criterion	6.577588324356536
Log likelihood	–21.0756...	Hannan-Quinn criter.	6.402031030671176
F-statistic	5.741079...	Durbin-Watson stat	2.059066171250941
Prob(F-statistic)	0.061922...		

The unit root test performed explains that it has 'p' value less than 0.50 so it could be postulated that it is not stationarity. Using the operation with first difference method is depicted below;

```
Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=1)
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		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.792191	0.1220
Test critical values:	1% level	-5.604618	
	5% level	-3.694851	
	10% level	-2.982813	

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*MacKinnon (1996) one-sided p-values.
Warning: Probabilities and critical values calculated for 20 observations
         and may not be accurate for a sample size of 5


Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 12/06/22   Time: 15:10
Sample (adjusted): 2018 2022
Included observations: 5 after adjustments
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Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-5.019730	1.797775	-2.792191	0.1079
D(GDP(-1),2)	2.606052	1.295322	2.011895	0.1819
C	-7.540030	4.811667	-1.567031	0.2576

R-squared	0.912351	Mean dependent var	-0.220000
Adjusted R-squared	0.824703	S.D. dependent var	16.25537
S.E. of regression	6.805886	Akaike info criterion	6.957162
Sum squared resid	92.64016	Schwarz criterion	6.722825
Log likelihood	-14.39290	Hannan-Quinn criter.	6.328224
F-statistic	10.40918	Durbin-Watson stat	1.829290
Prob(F-statistic)	0.087649		

OLS Regression

ANOVA[a]

	Model	Sum of Squares	df	Mean Square	F	Sig.
	Regression	172.505	4	43.126	23.214	.014[b]
1	Residual	5.573	3	1.858		
	Total	178.079	7			

a. Dependent Variable: GDP

b. Predictors: (Constant), TEC, MOP, GrFC, LRF

Model Summary

Model	R	R Squar	Adjusted R Square	Std. Error of the Estimate
1	.984a	.969	.927	1.36300

a. Predictors: (Constant), TEC, MOP, GrFC, LRF

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-167.124	28.081		-5.952	.009
	MOP	-.617	.148	-.860	-4.154	.025
	GrFC	.232	.056	.505	4.160	.025
	LRF	3.566	.601	1.200	5.935	.010
	TEC	.293	.093	.352	3.147	.051

a. Dependent Variable: GDP

Fixed Effect Model

Dependent Variable: GDP
Method: Least Squares
Date: 12/06/22 Time: 21:11
Sample: 2015 2022
Included observations: 8

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GRFC	0.240128	0.172630	1.391002	0.2366
LRF	-0.006559	0.077545	-0.084577	0.9367
MOP	0.115442	0.257598	0.448149	0.6772
TEC	0.256052	0.287551	0.890458	0.4235

R-squared	0.599184	Mean dependent var	5.237500
Adjusted R-squared	0.298573	S.D. dependent var	5.043790
S.E. of regression	4.224237	Akaike info criterion	6.026407
Sum squared resid	71.37673	Schwarz criterion	6.066128
Log likelihood	-20.10563	Hannan-Quinn criter.	5.758507
Durbin-Watson stat	2.385763		

The table drawn above explains that as the 'p' value is comparatively very low in case of GrFC and GDP it could be said that it is very significant to explain the dependent variable.

In GDPit=0.11 **InMOPit**+ 0.24**InGrFCFoit**- 0.006**InLRFit**+0.25**InTECit**

Thus, the econometric model in the equation postulate that MOP, GrFC,

TEC is positively related with GDP, while LRF is inversely related with GDP.

Findings and Suggestions

Thus, from the analysis undertaken it is found out that there exists a positive relationship between GrFC, MOP and TEC with GDP and a negative relationship with LRF. Thus the hypothesis formulated becomes;

HYPOTHESIS	RESULTS
H1: There exists a positive influence of manufacturing sector on the GDP growth of a particular economy	Supported
H2: Physical and social infrastructure investment has a positive impact on GDP formation of a particular country	Supported
H3: Employment and labour force structure has an impact on GDP growth rate of an economy	Rejected
H4: Technological factors highly influences the working of GDP of an economy	Supported

Limitations of the Study

1. The study was basically done for a period of seven years where it could be seen that the fluctuations in the data trend is minimum

2. Hausman test and random effect comparison is not undertaken to check which model is a better one

3. Pre and post covid situations could also be compared using the statistical tool

Conclusion

The paper basically tries to analyse whether it is the fluctuations in the manufacturing sector that caused downfall of GDP situations in the economy. The data was analysed based on estimated values corresponding to manufacturing of output, labour force participation rate, technological factor and Gross fixed capital formation. Most of the literature studies claims and considers manufacturing sector as the most important factor governing the

investment structure of an economy. However, it is correctly said that all determinant's affecting GDP is equally important. The data was analysed by collecting data corresponding to 2015-2022.GDP was taken as dependent variable and MOP, GrFC, TECH, LRF as independent variable. Fixed effect model is utilised to understand the working of the model which showed that there exists a positive relationship between MOP, TEC and GrFC and ana inverse association with LRF.

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ABOUT THE AUTHOR

Kaveya, P. is a research scholar in Department of Economics, University College, Trivandurum, Kerala, India. She had presented 25 papers and published 26 articles. She is the recipient of INSC and IIAR young researches award. She is editor of many national and international Journals.

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