International Journal of Current Advanced Research
ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: 6.614
Available Online at www.journalijcar.org
Volume 9; Issue 06(E); June 2020; Page No.22628-22632
DOI: http://dx.doi.org/10.24327/ijcar.2020.22632.4471

Research Article

THE IMPACT OF MACROECONOMIC VARIABLES ON ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM INDIA

Dr. Sushma Shukla

Assistant Professor, Northern Virginia Community College Annandale, VA, USA

A R T I C L E I N F O

Article History:
Received 6th March, 2020
Received in revised form 15th April, 2020
Accepted 12th May, 2020
Published online 28th June, 2020

Key words:

Economic Growth, Consumption Expenditure, Real interest rate, Gross saving rate, Inflation, Foreign direct investment.
JELCodes:-E2,E31, E43, F43, O4

A B S T R A C T

The main objective of the study is to investigate the relationship between macroeconomic variables and economic growth in India. This study has used the macroeconomic data from the world bank's database over 40 years from 1978 to 2018. This paper has employed correlation coefficient and multiple linear regression models to analyze the relationship among seven macroeconomic variables GDP growth rate, Final consumption expenditure, Gross savings, real interest rate, foreign direct investment inflow, foreign direct investment outflow, and inflation. The result of the correlation coefficient establishes a negative and insignificant association between GDP growth rate and inflation. However, final consumption expenditure, gross savings, real interest rate, foreign direct investment inflow, foreign direct investment outflow, are positively associated with economic growth. The regression analysis results indicate that all the variables used in the study have demonstrated a significant impact on the GDP growth rate of India. Therefore, this study concludes that among all the variables studied in the study, final consumption expenditure is a key driver of India's economic growth.

INTRODUCTION

India has emerged as one of the fastest-growing economies in the world as per the International Monetary fund. India has achieved a robust economic growth of an average of approximately 7% from the last two decades. India is the sixth-largest economy in the world measured by the nominal GDP and the third-largest measured by purchasing power parity (International Monetary Fund, 2013). India's diverse economy encompasses traditional village farming, modern agriculture, handicrafts, a wide range of modern industries, and a multitude of services. India has capitalized on its large educated English-speaking population to become a major exporter of information technology services, business outsourcing services, and software workers. According to the world bank, with 1.2 billion people and the world's fourth-largest economy, India's recent growth and development has been one of the most significant achievements of our times (World Bank, 2016). Over the six and half decades since independence, the country has brought about a landmark agricultural revolution that has transformed the nation from chronic dependence on grain imports into a global agricultural powerhouse that is now a net exporter of food. Life expectancy has more than doubled, literacy rates have quadrupled, health conditions have improved, and a sizeable middle class has emerged. India is now home to globally recognized companies in pharmaceuticals, steel and information and space technologies, and a growing voice on the international stage that is more in keeping with its enormous size and potential.

According to Shukla, S. (2017a). History explains to us that economic growth was always a goal for human beings, for society, and a nation. A country's economic growth drives by many macroeconomic variables such as inflation, interest rate, foreign direct investment, and exchange rate. This paper focuses on assessing the macroeconomic drivers of economic growth in India in the last 40 years. The fundamental objective of economic policy is to achieve long term sustainable economic growth stable price level and lower unemployment. This paper's main objective is to analyze the relationship among macroeconomic variables like final consumption expenditure, gross savings, real interest rate, foreign direct investment inflow, foreign direct investment outflow, inflation, and their effect on the economic growth of India. This research paper makes some recommendations for future economic policy to achieve sustainable economic growth and lowering poverty. According to Shukla, S. (2017), India's economy is one of the fastest-growing economies in the world, but it's

Corresponding author:* **Dr. Sushma Shukla
Assistant Professor, Northern Virginia Community College Annandale, VA, USA

21.9% population survives below the poverty line, which can be reduced by implementing the goal-oriented economic policies.

Literature Review

The impact of macroeconomic variables such as inflation, and the interest rate on economic growth, productivity, and GDP has been one of the important issue studies by the macroeconomic researcher. Sibanjan Mishra (2016) examined the macro-economic variables like the gross domestic product, real effective exchange rates, the balance of payments, consumer price index, and gross capital formation for the Indian economy from the period of 1980-2013. This study adopts time-series estimations like ARDL co-integration test and the Toda Yamamoto Granger causality test. The causality test validates causation existing between FDI and all economic variables under study except REER. Stanley Fischer (1991) study presents a variety of evidence that macroeconomic policies matter for long-run growth. First, macroeconomic variables enter the typical new growth theory cross-country regressions with statistical significance and the expected signs. Second, evidence from large multicounty case studies, and case studies of Chile and Cote d'Ivoire presented in the paper, shows that macroeconomic policy choices have had a significant impact on growth over periods of more than a decade. He concludes that macroeconomic policy choices, including the budget deficit, the exchange rate system, and those choices that determine the inflation rate, matter for long-term economic growth.

Bende-Nabende, A. & Ford, J.L. & Slater, J.R. (1997) This empirical studies based on structural models have demonstrated that FDI stimulates the economic growth process of developing host countries through its positive spillover effects. In this study, the authors empirically investigate the dynamic impact on policy variables on FDI and its spillover effects variables and consequently, the economic growth process of the ASEAN-5 Economies in the time period of 1970-1994. Domac, Ilker & Peters, Kyle & Yuzefovich, Yevgeny (2001) examines whether a country's exchange rate regime has any impact on inflation and growth performance in transition economies, the authors develop an empirical framework that addresses some of the main problems plaguing empirical work in this strand of the literature: the Lucas critique, the endogeneity of the exchange rate regime, and the sample selection problem. Empirical results demonstrate that the exchange rate regime does affect inflation performance.
Narayan Sethi (2013) examines the effects of private foreign capital inflows (FINV) on macroeconomic variables in India. The study also examines the trends and composition of capital inflows into India. Using the Vector Auto regression (VAR) method, this paper specifically examines the effects of private foreign capital inflows (FINV) on macroeconomic variables in India. This study is based on the monthly data from 1995:04 to 2011:07 and incorporating the macroeconomic variables such as exchange rate (EXR), inflation, money supply (M3), export (EXPO), import (IMP), foreign exchange reserve (FOREX) and economic growth (IIP as a proxy of GDP). The important observations emerge from the VAR analysis which shows there is dynamic short and long equilibrium relationship between few macroeconomic variables like exchange rate (EXR), foreign exchange reserve (FOREX), index of industrial production (IIP) and money supply (M3) with private foreign capital inflows (FINV) during the study period from 1995:2010. Teboho Jeremiah Mosikari & Diteboho Lawrance Xaba & Johannes Tshepiso Tsoku (2016) examine the macroeconomic determinants of economic growth in Botswana. The study adopted the Keynesian expenditure approach to identify the factors influencing Botswana's economic growth. The study used the time series data spanning from 1966 to 2014. The paper applied a robust Engle-Granger approach to examine the long-run equilibrium between Keynesian macroeconomic factors and economic growth. The study recommends that economic policymakers in Botswana should reconsider the import structure of the economy in such a way that they promote the import of capital goods that will impact positively to economic growth in the long run that will translate to eradicate poverty and reduce unemployment. Prasanna and Gopakumar's (2008) study shows that there is a long-run negative relationship between inflation and GDP growth rate in India. Inflation is harmful rather than helpful to growth.

DATABASE AND METHODOLOGY

In this study, secondary data has been used. The primary source of the data is the World Bank's databank World Development Indicators. The time frame of this study is 40 years from 1978 to 2018, which gives (40) data points which is statistically large and significant to be used for the study. The following table represents the variable used in the study and their definition.

Table 1 the variables used in the models

Code	Indicator Name
GDPGR	GDP growth (annual %)
FICOEX	Final consumption expenditure (annual % growth)
GRSAV	Gross savings (% of GDP)
REINTE	Real interest rate (%)
FDINI	Foreign direct investment, net inflows (% of GDP)
FDINO	Foreign direct investment, net outflows (% of GDP)
INF	Inflation, GDP deflator (annual %)

Source: Data from the database: World Development Indicators

Table 2 Correlation Coefficient Analysis

	GDPGRR	FICOEX	GRSAV	REINTE	FODINI	FODINO	INF
GDPGRR	1						
FICOEX	0.79	1.00					
GRSAV	0.39	0.41	1.00				
REINTE	0.21	0.06	-0.40	1.00			
FODINI	0.25	0.41	0.85	-0.35	1.00		
FODINO	0.20	0.25	0.70	-0.43	0.85	1.00	
INF	-0.05	-0.09	-0.20	-0.33	-0.16	-0.07	1.00

The table above shows the correlation coefficient analysis. Correlation coefficient analysis is a measurement of the relationship between two variables. The correlation coefficient values are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense; a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship exists between the two variables. The results for correlation coefficient analysis clearly indicate that the GDP growth rate of India positively related with Final

consumption expenditure, Gross savings, Real interest rate, Foreign direct investment, net inflows, and Foreign direct investment net outflows there is a negative correlation of --0.05 exist between economic growth rate and inflation rate.

Table 3 Variables descriptive statistics

	FDINO	*FDINI*	*INF*	*RIRATE*	*GDPGR*
Mean	0.67	1.67	5.44	5.42	7.19
Standard Error	0.14	0.21	0.61	0.73	0.51
Median	0.47	1.65	5.73	5.77	7.56
Standard Deviation	0.53	0.82	2.38	2.83	1.96
Sample Variance	0.28	0.66	5.65	7.99	3.85
Kurtosis	-1.03	1.10	-0.91	-0.17	-0.65
Skewness	0.75	0.91	0.02	-0.61	-0.44
Range	1.53	3.06	7.92	9.62	6.46
Minimum	0.09	0.60	1.07	-0.60	3.80
Maximum	1.62	3.66	8.98	9.02	10.26
Sum	10.11	25.08	81.55	81.37	107.90
Count	15.00	15.00	15.00	15.00	15.00

Source: Data from the database: World Development Indicators

Table -3 shows the descriptive statistics of the variables used in the model to analyze the relationship between economic growth and macroeconomic variables for the period of 1978 to 2018.

Model

This study has used a multiple linear regression model. That analyzes the effect of some independent variables on one dependent variable. In this model-independent variables are Final consumption expenditure, Gross savings, Real interest rate, Foreign direct investment net inflows, Foreign direct investment net outflows, Inflation, and the dependent variable is GDP growth rate. The model specified is:

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \beta 5X5 + \beta 6X6 + \varepsilon ij$$

Where :- Y = GDPGR, X1=FICOEX , X2=GRSAV, X3=REINTE, X4=FODINI, X5= FODINO, X6= INF The model is re-specified as GDP = β0 + β1 FICOEX + β2 GRSAV + β3 REINTE + β4 FODINI,+β5FODINO + β6 INF where β0, β1, β2, β3, β4, β5 and β6 are the regression coefficients which are estimated from the sample data. The $\boldsymbol{\varepsilon}_{ij}$is the random error term.

Results

The results of the multiple linear regression model developed in the study displayed in the table below.

Table 4 Regression coefficients

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	-7.34	1.68	-4.38	0.00
FICOEX	0.89	0.11	8.36	0.00
GRSAV	0.25	0.05	4.71	0.00
REINTE	0.38	0.10	3.94	0.00
FODINI	-2.50	0.58	-4.28	0.00
FODINO	2.47	0.89	2.77	0.01
INF	0.15	0.07	2.04	0.05

Based on the output the actual regression model can be developed like this

$Y = -7.34 + 0.89X_1 + 0.25 X_2 + 0.38X_3 - 2.50X_4 + 2.47 X_4 + 0.15 X_6$

Y = -7.34+ 0.89 FICOEX +0.25 GRSAV+0.38 REINTE-2.50 FODINI +2.47 FODINO +0.15 INF

Where Y, X1, X2, X3, X4, X5, and X6 denote their same meaning mentioned before. The model is thus analyzed as follows.

In this model intercept is -7.34 which is the GDP growth rate when Final consumption expenditure(X1), Gross savings(X2), Real interest rate(X3), Foreign direct investment, net inflows(X4), Foreign direct investment net outflows(X5), and Inflation(X6) are zero, and all the other factors are constant. It is obvious if there is no economic activity in the economy, economic growth will be negative. Economic growth will increase by 0.89 when final consumption expenditure(X1) changes by one unit. Basically, 89% growth is based on final consumption expenditure(X1); this shows India is a consumer-based economy. Economic growth changes by 0.25 when Gross savings(X2) changes by one unit. In other words, 25% of economic growth is positively affected by the saving rate. Compare to developed countries like the united states, and it is very high. Higher interest rate leads to more savings which ultimately lead to investment. Economic growth changes by 0.38 when Real interest rate(X3) changes by one unit. It means 38% of Economic growth is explained by interest rate. Economic growth changes by -02.50 when Foreign direct investment, net inflows(X4), changes by one unit. Economic growth changes by 2.47 when Foreign direct investment net outflows(X5),changes by one unit. Economic growth changes by 0.15 when Inflation(X6) changes by one unit. Usually high Real interest rate has a negative effect on economic growth because a higher real interest rate demotivates private investment in the economy. Lower investment decreases the total output and leads a country towards lower economic growth. While usually, Inflation positively related to the economic growth of an economy. Higher prices motivate investors to invest more, and that increases the output of the economy. When output increases it increases the income level that creates demand-pull inflation. As Prasanna andGopakumar argued that industrial countries‘ threshold of inflation is placed between 1 to 3 %, for developing countries, it ranges from 8% to 40 % (Bruno and Easterly, 1995; Khan and Senhadji, 2002; Sarel, 1996). They suggest that the threshold is not fixed over time across countries - it is time-varying and country-specific in nature. But that is not the case in the Indian economy. Based on the available data, results show a negative relationship between GDP growth and inflation. The coefficients of x1 (inflation rate) of -0.381 imply how much or the magnitude by which GDP would change (in this case would decrease) per unit change in x1 (inflation rate).

Table 5 Model Summary of other Regression Statistics

Regression Statistics	
Multiple R	0.90
R Square	0.81
Adjusted R Square	0.77
Standard Error	1.22
Observations	41.00

Table 5 is the summary of other regression coefficients of the model; it has been used to check -the adequacy of the multiple linear regression model developed in this study. The model competence inspection is done using the statistics in table 5, R, and R square represent the multiple correlation and coefficient, respectively. The Multiple R (0.90) and R Square (.81)show that there is a positive correlation exist between the dependent variable GDP growth and independent variables. Final consumption expenditure, Gross savings, Real interest rate, Foreign direct investment net inflows, Foreign direct investment net outflows, Inflation. This defines if these macroeconomic variables increase the economic growth will also increase and vice versa.

Table 6 Analysis of Variance (ANOVA)

	df	*SS*	*MS*	*F*	*Significance F*
Regression	6.00	212.40	35.40	23.87	0.00
Residual	34.00	50.43	1.48		
Total	40.00	262.84			

Table 6 shows the analysis of variance (ANOVA), which is used to test the overall significance of the developed model. Moreover, whether the beta coefficients are significant or not.

The hypotheses of this model is

Null Hypothesis (H_0): The model is not significant $H_0:\beta_j=0$
Alternative Hypothesis (H_1): The model is significant $H_1:\beta_j\neq0$
The level of significance for this study is $\alpha=0.05$. The decision rule does not reject the null hypothesis if the F calculated is less than the F critical value, in other words, if the significance value of F is less than the level of significance, which is $\alpha=0.05$. Since the significance of F in this study is less than 0.05, therefore the null hypothesis rejected. So, the conclusion is there is at least one beta coefficient, which is not zero, and because of that, the overall model is significant.

CONCLUSION

It can be concluded from the model and analysis that finds that there is a negative correlation existed between GDP growth and inflation over the period under study. The government needs to adopt a policy that controls the price level in the economy. The central bank of India needs to control the money supply for a stable price level. Furthermore, strong R Square (.81) explains the significance of the variables analyzed in the study. However, final consumption expenditure (.89) is more influential than other variables used in the study. According to Mishra, P. K. (2011). "The rise in per capita income and surge in inflows of workers' remittances contributed to the rise in real private consumption expenditure during the period." Higher final consumption spending increased investment spending that led to higher economic growth in India. In other words, increasing final consumption spending increased the economic activity in India over the period under study. Expanding economic activities generated more investment opportunities that increased the no of jobs. Therefore, this study concludes that even though among all the six independent variables, inflation, gross savings, real interest rate, foreign direct investment inflow, foreign direct investment outflow, studied in the study final consumption expenditure, can be seen as a driver of India's economic growth.

Table 7 the variables used in the models

Code	Indicator Name	Long definition
GDPGR	GDP growth (annual %)	Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2005 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.
FICOEX	Final consumption expenditure (annual % growth)	Final consumption expenditure (formerly total consumption) is the sum of household final consumption expenditure (private consumption) and general government final consumption expenditure (general government consumption). This estimate includes any statistical discrepancy in the use of resources relative to the supply of resources.
GRSAV	Gross savings (% of GDP)	Gross savings are calculated as gross national income less total consumption, plus net transfers.
REINTE	Real interest rate (%)	Real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator. The terms and conditions attached to lending rates differ by country, however, limiting their comparability.
FDINI	Foreign direct investment, net inflows (% of GDP)	Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP.
FDINO	Foreign direct investment, net outflows (% of GDP)	Foreign direct investment refers to direct investment equity flows in an economy. It is the sum of equity capital, reinvestment of earnings, and other capital. Direct investment is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy. Ownership of 10 percent or more of the ordinary shares of voting stock is the criterion for determining the existence of a direct investment relationship. This series shows net

		outflows of investment from the reporting economy to the rest of the world, and is divided by GDP.
INF	Inflation, GDP deflator (annual %)	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.

Source: Data from database: World Development Indicators

References

1. Agalega, E., &Antwi, S. (2013). The impact of macroeconomic variables on gross domestic product: Empirical evidence from Ghana. *International Business Research*, *6*(5), 108.
2. Anghelache, Constantin, *et al*. "Aspects Regarding the Multiple Regression Used in Macro-economic Analysis." *Romanian Statistical Review Supplement* 62.1 (2014): 99-106.
3. Çekrezi, P. A. (2015). EXPLORING FACTORS THAT INFLUENCE ON GDP GROWTH RATE OF EUROPEAN UNION COUNTRIES. *Proceeding book*, 22.
4. Ciucu, S. C. (2014). ANALYSIS OF THE GDP IN THE REPUBLIC OF MOLDOVA BASED ON MAJOR MACROECONOMIC INDICATORS.*Challenges of the Knowledge Society*, 993.
5. Domaç, Ilker, Kyle Peters, and Yevgeny Yuzefovich. "Does the exchange rate regime affect macroeconomic performance? Evidence from transition economies." (2001).
6. Friedman, Milton. "The role of monetary policy." (1968): 1-19.
7. Ghazanchyan, MrManuk, and Ms Janet Gale Stotsky. *Drivers of growth: Evidence from sub-Saharan African countries*. No. 13-236. International Monetary Fund, 2013.
8. India and the IMF. (n.d.). Retrieved from https://www.imf.org/en/Countries/IND#whatsnew
9. India,United States : World Bank Announces New Country Director for India. (2016). MENA Report, n/a.
10. Jayathileke, Pradana M. Bandula, and Rathnayaka M. Kapila Tharanga Rathnayake. "Testing the link between inflation and economic growth: Evidence from asia." (2013).
11. Jilani, Sidrat, and Muhammad Asim. "Exploring Impact of Macro Economic Variables on GDP of Pakistan." *Journal of Management and Social Sciences* 6.2 (2010): 65-73.
12. Mosikari, Teboho Jeremiah, DitebohoLawranceXaba, and Johannes Tshepiso Tsoku. "Macroeconomic determinants of economic growth in Botswana: The Keynesian approach." *Proceedings of International Academic Conferences*. No. 4006365. International Institute of Social and Economic Sciences.
13. Mbulawa, Strike. "Effect of Macroeconomic Variables on Economic Growth in Botswana." (2015).
14. Mishra, P. K. (2011). Dynamics of the relationship between real consumption expenditure and economic growth in India. *indian Journal of economics & Business*, *10*(4), 553-563.
15. Munyeka, Wiza. "The Relationship Between Economic Growth and Inflation in the South African Economy." *Mediterranean Journal of Social Sciences* 5.15 (2014): 119.
16. Salian, P., &Gopakumar, K. (2008). Inflation and Economic Growth in India–An Empirical Analysis. *Indian Economic Service, New Delhi and Gopakumar. K, Faculty, BIET-MBA Programme, Davangere, Karnataka*.
17. Shah, K. R. "Inflation and Economic Growth: The Indian Experience." *Centre for Multi-Disciplinary Development Research (CMDR) serial* 24.
18. Sethi, N. (2013). Causal relationship between foreign capital inflows and economic growth: Empirical evidence from India. *International Journal of Economics, Finance and Management*, *2*(1).
19. Shukla, S. (2017a). Innovation and economic growth: a case of India. Humanities & Social Science Review, 5(2), 64-70.
20. Shukla, S. (2017b). Human capital and economic growth in India. *International Journal of Current Research*, 9(11), 61628-61631.
21. Sinha, Pankaj, Sushant Gupta, and Nakul Randev. "Modeling & Forecasting of Macro-Economic Variables of India: Before, During & After Recession." (2010).

How to cite this article:

Dr. Sushma Shukla (2020) 'The Impact of Macroeconomic Variables on Economic Growth: Empirical Evidence from India', *International Journal of Current Advanced Research,* 09(06), pp. 22628-22632.
DOI: http://dx.doi.org/10.24327/ijcar.2020.22632.4471

****