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ECONOMIC GROWTH AND ITS DETERMINANTS: A CROSS-COUNTRY EVIDENCE

Adedayo A. Adepoju¹, Tayo P. Ogundunmade²

ABSTRACT

Empirical evidence from a panel of 126 countries, over the time period of 2010 to 2014, indicates that economic growth is dependent on various factors. This paper finds that government expenditure control, reduced inflation and increased trade openness are the factors that boost the economic growth of a country. Significant evidence is seen for government consumption, fiscal policy and trade openness. No significant relationship has been observed between exchange rate and economic growth, whereas unemployment influences output for African countries. The cross regional analysis of Asian, European, African, Caribbean, and American countries gives specific determinants for these regions. Economic growth is also analysed in developing, developed, least developed, Muslim and petroleum exporting and emerging countries.

The results of this study validate the dependence of economic growth on various factors. Fiscal balance has shown a consistent positive relationship with economic growth throughout the analyses. Fiscal balance and unemployment rate played their role in the growth of African countries. Inflation rates and increased openness were significant for some regions. Exchange rate did not return significant coefficients for any of the sub-regions. Government consumption, trade openness, policy interest rate and industrial production rate showed significant effect for different regions of the world.

Key words: economic growth, panel data analysis, growth determinants.

1. Introduction

Economic growth, no doubt, is the backbone of an economy's development and its enhancement remains one of the major strategic and policy issues for the policymakers. Researchers, over the years, have analysed the economic growth and its development; special emphasis has been laid upon the factors that influence the economic growth. A vast body of economic literature has, empirically and Bayesian researched the economic growth and its determinants (Kormendi and Meguire 1985; Barro, 1990, 1995, 1996, 1997; Sachs and Warner 1997). These studies have identified several factors, having empirical and

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Bayesian backing, which impact economic growth of a country. Many researchers consider that the most promising approach to accounting for model uncertainty is to employ model averaging techniques. This approach allows constructing parameter estimates that formally address the dependence of model specific estimates on a given model. The studies relating to economic growth have used cross-sectional, time-series and panel data models for their analyses. This study has focused on panel/longitudinal (cross-sectional time-series) data to investigate the relationship. This study utilizes panel data for 126 countries over the time period of 5 years in order to determine the impact of fiscal policy, government consumption, inflation, trade openness, policy interest rate, industrial production, unemployment and public debt on the economic growth.

Should cross-country growth evidence be discounted? Are there no growth determinants that are robust to variable selection? Carmen Fernandez, Eduardo Ley, and Mark F. Steel (2001b) and Xavier Sala-i-Martin, Gernot Doppelhofer, and Ronald I. Miller (2004) propose to answer these questions using Bayesian model averaging.

Literature vastly contains evidence on the relationship between economic growth and the factors influencing it. Barro (1996b) identified various factors which enhance the real per capita GDP growth rate. These factors include low government consumption, low inflation and rule of law. Various other factors which influence growth are greater life expectancy level (indicator for health), higher schooling levels (indicator for human capital) and better trade terms. Drury, Kriekhaus and Lusztig (2006) found insignificant relationship between economic growth and population growth; and between economic growth and life expectancy. Barro (1996a) found significant effects of rule of law, openness, less government consumption and increased human capital; in growth determination.

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Dewan and Hussein (2001) used a sample of 41 middle-income developing countries to develop an empirical model for growth. The study also presents a wide-ranging examination of both theoretical and empirical evidence on the many ways macroeconomic policies affect growth. The results suggest that apart from

growth in the labour force, investment in both physical and human capital, as well as low inflation and open trade policies are necessary for economic growth. Furthermore, the ability to adopt technological changes in order to increase efficiency is also important. Since many developing countries have a large agricultural sector, adverse supply shocks in this sector was found to have a negative impact on growth. Yanikkaya (2003) notes that there are different measures of measuring trade openness that can be found in literature. Many researchers have used the simple measure of trade openness (exports plus imports divided by GDP), whereas others have used different other available measures. Using the simple measure, Harrison (1996) reports that researchers have found robust positive relationship between trades share in GDP and economic growth. Machi (2011) empirically test the determinants of economic growth in Nigeria using time series data ranging from 1970 to 2008 and adopting the Johansens method of co-integration-regression analysis. The findings showed that policies that encourage investments in physical capital, human capital, man power development, training, research and technological development would boost both short run and long term growth of the economy. Hence policy tools such as fiscal, monetary and income-price policies should be used by the government to achieve economic growth in Nigeria. Sabir and Tahir (2012) study the impact of different macroeconomic variables on the welfare of the poor in Pakistan, through annual time series data which spanned between 1981 and 2010. Using multiple regression technique to detect the relation between macroeconomic variables and poverty, the findings revealed that GDP growth rate per capita income, major crops, minor crops and livestock had negative impact while inflation and population growth rate had positive impact on poverty and concluded that reduction in poverty in Pakistan is driven by changes in the macroeconomic variables.

Zafar and Zahid (2013) examined the effects of some of the key macroeconomic variables on economic growth. Employing multiple regression framework and time series data over the period 1959-60 to 1996-97. The quantitative evidence shows that primary education is an important precondition for accelerating growth. Similarly, increasing the stock of physical capital and openness of the economy contribute to growth. The empirical results also suggested that budget deficit and external debt is negatively related to economic growth, suggesting that relying on domestic resources is the best alternative to finance growth and reinforce the importance of sensible long-run growth-oriented policies to obtain sustainable growth. The objective of this study is to identify the determinants of economic growth of selected countries using panel data regression approach. Also, to identify the variables that contribute to economic growth in the Developed, Developing, Least developed, Asian, Carribean, Tropical, Petroleum Exporting, Emerging market, European, American and Muslim countries (Abdulalh 2012).

The rest of the paper is structured as follows: Section 2 explains the model specification. Section 3 shows the empirical analysis of the study. Section 4 concludes the paper.

2. The model

Time series cross-sectional (panel) data of 126 countries has been used in the analysis. The annual time period ranges from 2010 to 2014.

Consider a linear regression model with a constant term, and k potential explanatory variables

$$Y_{it} = (X_{it}^j) \beta + e_{it}$$

$i = 1, 2, 3 \dots N$; $t = 1, 2, 3 \dots T$ where,

Y_{it} = GDP per capita

X_{it} = the value of the j th explanatory variables for unit i at time t . There are k explanatory variables indexed by $j = 1 \dots k$. The variables considered are Policy Interest Rate, Industrial Production, Trade Openness, Unemployment Rate, Exchange Rate, Public Debt, Fiscal Balance and Inflation rate.

Real GDP growth, representing economic growth, is the dependent variable. Data for all the variables used were obtained from the World Bank World Development Indicators (WDI) database. GDP per capita stands for Gross Domestic Product (GDP) per capita (per person), and it is derived from a straightforward division of total GDP by the population. Per capita GDP is typically expressed in local current currency, local constant currency or a standard unit of currency in international markets, such as the U.S. dollar (USD). Initial real GDP for a particular year was also used as an independent variable.

GDP per capita is an important indicator of economic performance and a useful unit to make cross-country comparisons of average living standards and economic wellbeing. However, GDP per capita is not a measure of personal income and using it for cross-country comparisons also has some known weaknesses. In particular, GDP per capita does not take into account income distribution in a country. In addition, cross-country comparisons based on the U.S. dollar can be distorted by exchange rate fluctuations and often do not reflect the purchasing power in the countries being compared.

Industrial production measures the output of the industrial sector, which typically comprises mining, manufacturing, utilities and, in some cases, construction. The industrial production indicator is generally provided as an index in volume terms.

Inflation refers to an overall increase in the Consumer Price Index (CPI), which is a weighted average of prices for different goods. The policy interest rate is an interest rate that the monetary authority (i.e. the central bank) sets in order to influence the evolution of the main monetary variables in the economy (e.g. consumer prices, exchange rate or credit expansion, among others).

The policy interest rate is an interest rate that the monetary authority (i.e. the central bank) sets in order to influence the evolution of the main monetary variables in the economy (e.g. consumer prices, exchange rate or credit expansion, among others).

Other factors that contribute to economic growth is Public debt, sometimes also referred to as government debt, represents the total outstanding debt (bonds and other securities) of a country's central government. It is often expressed as a ratio of Gross Domestic Product (GDP).

Private consumption also referred to as personal consumption, consumer expenditure, or also referred to as personal consumption, consumer expenditure, or personal consumption expenditures (PCE), measures consumer spending on goods and services.

Fiscal balance, sometimes also referred to as government budget balance, is calculated as the difference between a governments revenues (taxes and proceeds from asset sales) and its expenditures. It is often expressed as a ratio of Gross Domestic Product (GDP). If the balance is positive, the government has a surplus (it spends less than it receives). If the balance is negative, the government has a deficit (it spends more than it receives). Fiscal balance as a percentage of GDP is used as an instrument to measure a government's ability to meet its financing needs and to ensure good management of public finances.

The unemployment rate is defined as the percentage of unemployed workers in the total labour force. Workers are considered unemployed if they currently do not work, despite the fact that they are able and willing to do so. The total labour force consists of all employed and unemployed people within an economy. The unemployment rate provides insights into the economy's spare capacity and unused resources. Unemployment tends to be cyclical and decreases when the economy expands as company's contract more workers to meet growing demand. Unemployment usually increases as economic activity slows.

3. Analysis

Panel data for 126 countries over the period of 2010– 2014 yielding a panel with $N = 126$ and $T = 5$. Clearly, our pool is cross-sectional dominant ($N > T$). Separate regressions were run for the complete sample and then for sub-samples consisting of developing, developed, least developed, petrol exporting, emerging, Caribbean, Asian, European, American region, African and Muslim countries; in order to get an insight into the relevant determinants of economic growth for these sub-samples. A panel regression analysis was used to run the separate regressions as it better used over ordinary least squares when the data is cross-sectional and time dominant.

Table I gives the descriptive statistics of the variables under consideration. It gives the minimum, 1st quartile, median, mean, 3rd quartile and the maximum values of each of the variables across the countries under consideration.

Table 1. Summary Statistics

Variables	Minimum	1st Quartile	Median	Mean	3rd Quartile	Maximum
GDP per capital	306	3360	8062	18370	25810	125700
Consumption rate	-8.72663	0.05884	0.025030	0.90396	0.89000	35.8000
Exchange rate	0.010	1.380	7.535	816.819	106.175	28050.00
Fiscal balance	-32.300	-4.475	-2.600	-2.318	-0.800	34.500
Industrial production	-15.264	0.01402	0.18078	0.96809	0.84002	58.59155
Inflation rate	-35.100	-1.900	3.400	3.777	8.500	62.200
Public debt	0.10	25.25	38.40	47.22	60.65	212.00
Unemployment rate	0.300	4.425	7.100	8.931	11.400	40.600

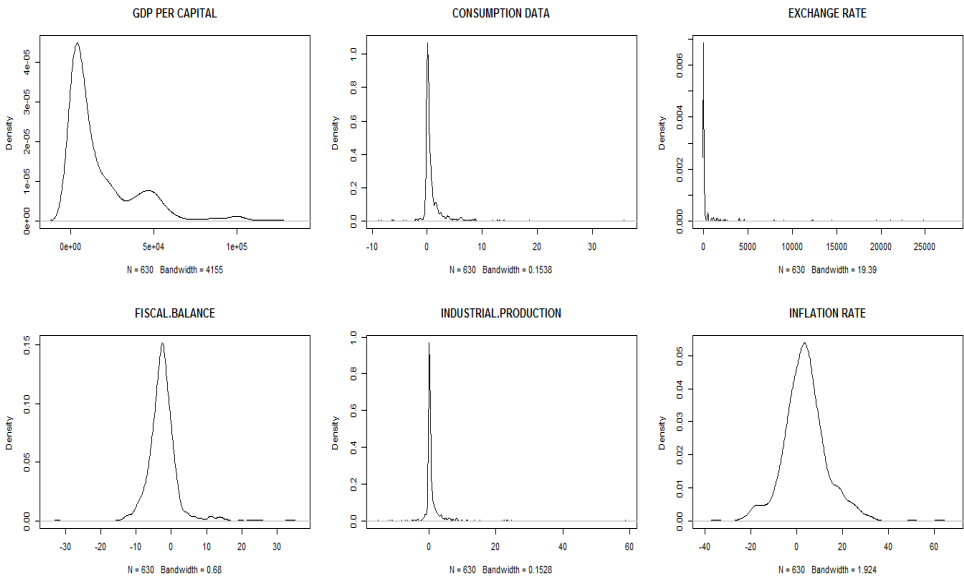


Figure 1. Density plot of the variables

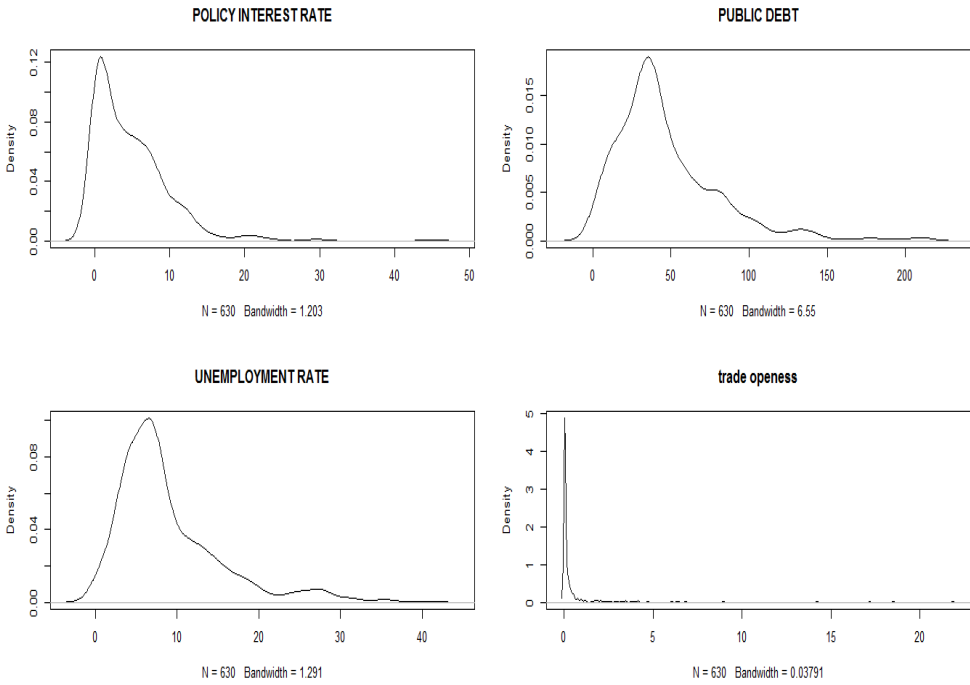


Figure 2. Density plot of the variables

Figures 1 and 2 show the density plot of the variables used in the analysis. Each of the variable was plotted to know the shape of the data.

Table 2. Results for Economic Growth and its Determinants

Variables	(a)	(b)	(c)	(d)	(e)	(f)
Consumption rate	4.47e-05*	0.9693	0.99708	0.1425	0.006*	0.018*
Exchange rate	0.57873	0.3002	0.3963	0.4468	0.4062	0.881
Fiscal balance	7.93e-10*	1.58e-05*	0.0446*	0.002*	0.6648	0.359
Industrial production	0.002*	0.9839	0.3731	0.7225	0.1833	0.441
Inflation rate	0.1245	0.2458	0.5649	0.4967	0.0836	0.86
Policy interest rate	0.1078	0.1681	0.5884	0.8617	0.0388*	0.831
Public debt	0.4348	0.6643	0.7787	0.7357	0.4348	0.905
Unemployment rate	0.6467	0.3272	0.593	0.3766	0.007*	0.248
Trade openness	0.00256*	0.0277*	0.003*	0.9891	0.4453	0.268
R^2	0.34	0.24	0.32	0.31	0.28	0.23

Table 2. Results for Economic Growth and its Determinants (cont.)

Variables	(g)	(h)	(i)	(j)	(k)	(l)	(m)
Consumption rate	5.9e-11*	0.00238*	0.95	0.0069*	0.9217	0.9356	0.9287
Exchange rate	0.1923	0.6291	0.763	0.6353	0.668	0.3638	0.8676
Fiscal balance	0.0005*	4.65e-07*	0.0446*	1.38e-05*	9.15e-10*	0.9314	4.28E-10*
Industrial production	0.3835	0.01762*	0.304	0.3918	0.6701	0.413	0.6159
Inflation rate	0.5779	0.89085	0.298	0.4441	0.4173	0.8191	0.7873
Policy interest rate	0.7822	0.37666	0.164	0.3717	0.8164	0.4226	0.1559
Public debt	0.4364	0.70152	0.179	0.593	0.9516	0.7786	0.4479
Unemployment rate	0.8032	0.12014	0.16	0.2214	0.1549	0.342	0.5642
Trade openness	0.0235*	0.08373	0.032*	0.3599	0.0007*	0.9026	0.0261*
R^2	0.13	0.15	0.28	0.21	0.21	0.19	0.15

(*) implies significance

Table 2 above contains the significance value of economic variables. Columns (a) represents the analysis for the complete panel; Columns (b),(c),(d), (e) and (f),(g), (h),(i),(j), (k) and (l) shows analyses for developed countries, developing countries, least developed countries, African countries and American countries, Emerging market, European countries, Asian countries, Tropical countries, Petroleum countries, Caribbean countries and Muslim Countries respectively.

3.1. Economic growth in the complete panel

Table 2 (Column a) gives the results of the regression for the complete panel of 126 countries. The R^2 statistic, 0.34 (34%), is not very strong. Low R^2 values have also been reported by Drury (2006) and Abdullah (2012) for the similar analysis. Government consumption (significant), Fiscal balance (significant), industrial production (significant) and trade openness (significant) return positive coefficients except government consumption (significant); which indicates that all these variables have positive impact on economic growth. The significance of the fiscal balance, government consumption rate, openness, inflation and industrial production variables contribute to economic growth.

An increase in the level of government consumption rate of a country, economic growth tends to be affected; complementing the results of Mauro (1995). Therefore, in order to boost a country's economic growth, government consumption rate should be minimized.

Government expenditure is also seen to impact the economic growth. Barro (1990) mentioned the dependence of long run growth on the structure of government expenditure. Barro (1997) mentioned that government consumption retards growth; our analysis also indicated that government consumption, affects growth.

Openness is found to have a positive impact on a country's economic growth. Harrison

(1996) has also observed a similar positive relation between openness and growth. Open international market boost a country's economic growth and open economies tend to grow more rapidly as compared to those whose trade have restrictions.

Industrial production casts a positive effect on the economic growth; complementing the results of Kormendi and Meguire (1985), Cozier and Selody (1992) and Barro (1995, 1996). Fiscal balance also impacts economic growth indicating higher fiscal policy which boost economic growth; accepting the view of Matsuyama (1992).

Generalizing the results, it can be concluded that decreased government consumption rate, increased openness, increased industrial production and a moderate trade openness will enhance the economic growth of a country.

3.2. Economic growth in developed countries

The analysis of developed countries in Table 2 (Column b) shows that only fiscal balance and trade openness relate to the economic growth. The R^2 statistic for the regression is 0.24 (24%). Fiscal balance yields a positive coefficient, as expected; whereas trade openness returns a positive coefficient. Drury, Kriekhaus and Lusztig (2006) found an insignificant relationship between trade openness and economic growth; however for our study of developed countries, the relationship is significant. In general, for developed countries, high fiscal policy trade openness enhance economic growth.

3.3. Economic growth in developing countries

Similar method, to the one presented for the complete panel, is used to analyze the economic growth in the developing countries in Table 2 (Column c).

The R^2 statistic for the regression is 0.32 (32%). Fiscal balance and trade openness give positive coefficients, as is the case in the complete panel. The only difference in the results for the complete panel and developing countries is that fiscal balance, although having a negative coefficient, is found to be significant.

Generalizing the results for developing countries; we conclude that increased openness to trade and fiscal balance contribute significantly, towards the economic growth in a developing country.

3.4. Economic growth in least developed countries

The analysis for least developed countries is presented in Table 2 (Column d) only fiscal balance returns significant. The R^2 statistic for the regression is 0.31 (31%).

Most of the least developed countries are mostly dependent on the manpower for output.

So, the positive relationship between fiscal balance and economic growth, as indicated by Barro (1996), shows that high fiscal balance can lead to higher economic growth.

3.5. Economic growth in African countries (East, West and Central African Countries)

The result for African countries (Table 2 Column e) show significant relationship between government consumption (negative), unemployment rate (negative), policy interest rate and economic growth. The R^2 statistic for the regression is 0.28 (28%). This implies that unemployment rate has adverse effect on economic growth in African countries.

In general, low unemployment rate and low government consumption rate will contribute to a higher economic growth in African countries.

3.6. Economic growth in American region countries (North, South and Central American Countries)

The analysis for the American region countries (Table 2 Column f) only returns negative government consumption. The R^2 statistic for the regression is 0.23 (23%). Hence, for American region countries, low government consumption will route towards a successful economic growth.

3.7. Economic growth in emerging markets/countries

For emerging countries (Table 2 Column g); the analysis shows a positive coefficient for trade openness, government consumption rate and a positive coefficient for fiscal balance. The positive coefficient for fiscal balance is consistent with our findings for other regions. The positive coefficient for trade openness is also consistent with the findings of Barro (1996, 1997) and consistent with those of Aschauer (1990). Government may allocate resources to the effective and required sectors in order to boost up economic growth. The R^2 statistic for the regression is 0.13 (13%). So, in the case of emerging markets/countries; high fiscal policy and high trade openness lead to better economic growth.

3.8. Economic growth in European countries

Analysis for European countries (Table 2 Column h) shows that Government consumption rate, openness and industrial production significantly impact economic growth. The positive fiscal balance, positive coefficient for openness and a negative coefficient for government consumption are all aligned with the literature on economic growth. The R^2 statistic for the regression is 0.15 (15%). Generalizing the results for European countries; reduced government consumption, increased openness and increase industrial production contribute to a sound economic growth.

3.9. Economic growth in Asian countries

For Asian countries (Table 2 Column i); fiscal balance (positive coefficient) and openness (positive coefficient) give significant coefficients in the regression analysis. The R^2 statistic for the regression is 0.28 (28%). The positive coefficient for openness and positive coefficient for fiscal balance are consistent with the theory on these coefficients; as mentioned in the above analyses. So, high fiscal balance and increased trade openness contribute to a high economic growth in Asian countries.

3.10. Economic growth in Tropical countries

For Tropical countries (Table 2 Column j), the regression analysis with PCSEs (Panel Corrected Standard Error) returns two significant variables. Fiscal balance (positive coefficient) and government consumption rate show significant result to economic growth. The positive coefficient shows high trading in this region and this leads to a higher economic growth in Tropical countries. The R^2 statistic for the regression is 0.21 (21%).

Generalizing the results for Tropical countries; high government consumption and high trade openness lead to high economic growth.

3.11. Economic growth in petroleum exporting countries

For petroleum exporting countries (Table 2 Column k), the regression analysis with PCSEs returns two significant variables. Fiscal balance (positive coefficient) and trade openness (positive coefficient) show significant result to economic growth. The positive coefficient for trade openness indicates that higher trade openness leads to a higher economic growth in petroleum exporting countries. The R^2 statistic for the regression is 0.21 (21%).

Generalizing the results for petroleum exporting countries; high fiscal policy and high trade openness lead to high economic growth.

3.12. Economic growth in Caribbean countries

For Caribbean countries (Table 2 Column l), no variable return significant. The R^2 statistic for the regression is 0.19 (19%). Generalizing the results for Caribbean countries, no variable contributes to economic growth.

3.13. Economic growth in Muslim countries

Regression analysis for Muslim countries (Table 2 Column m) returns significant coefficients for trade openness (positive coefficient) fiscal balance (positive coefficient).

The R^2 statistics for the regression is 0.15(15%). Positive coefficient for trade openness indicates the need for a trade-free environment to prevail in the Muslim countries in order to attain a higher economic growth. Positive relationship of fiscal balance with economic growth shows that more fiscal measures will yield higher levels of economic growth.

In general, for Muslim countries; high fiscal balance and high trade openness will bring higher economic growth.

4. Conclusion

For a broad panel of 126 countries, this paper investigated the relationship between economic growth and various variables which have strong theoretical support of affecting economic growth of a country. Thirteen separate regression analyses were conducted to check the impact of the variables on economic growth in different regions, cultures and classifications of the world.

Fiscal balance, throughout our analysis, returned positive coefficients; indicating that fiscal balance positively affects the economic growth of a country, irrespective of the location and status of the country. Unemployment rate only showed its significant coefficient for African countries, indicating the fact that unemployment rate will have better prospects of affecting economic growth in a country. Policy interest rate was also seen to positively impact the economic growth for least developed countries, showing its contribution in the country to boost up the economic output. Government consumption, fiscal balance, trade openness variables led to a mixed relationship with economic growth, positive for some of the regions whereas negative for other regions. Trade openness positively impacted economic growth for most of the regions, indicating that a country with open access to its trade is expected to have higher economic growth. Inflation, on the other hand, returned negative coefficients for most of our analyses.

This study makes several contributions to the existing knowledge on economic growth.

First, a very wide panel of 126 countries is used for the analysis. Second, separate regression analysis for developing countries, developed countries, least developed countries, petroleum exporting countries, emerging markets/countries, Caribbean countries, Asian countries, European countries, American region countries, African countries and Muslim countries were run. This gives an understanding of the relationship of economic growth and the variables under consideration for different regions and classifications of the world. Third, we have employed a variety of variables which had strong theoretical backing based on existing literature. Fourth, our results may help policy makers to focus on the specified areas that support the economic growth in a country or a region.

The results of the study present important implications for policy makers. Economists and relevant policymakers can use the analysis to have an insight

into the economic growth factors prevailing in the whole world (referring to the complete sample) and the ones having vital influence for the sub-samples analysis (referring to the regional analysis). The empirical results of the study can be essential for the direction of policies towards relevant factors that play significant roles in the enhancement and the development of the economy.

Future research should consider other relevant explanatory variables like labour force and investment (gross capital formation) and income inequality. Also, a causality analysis may be conducted for understanding the relationship between economic growth and its significant determinants.

REFERENCES

- ACHEN, C. H., (2000). Why Lagged Dependent Variables can Suppress the Explanatory Power of other Independent Variables, Paper presented at the annual meeting of the Political Methodology Section of the American Political Science Association, Los Angeles, CA, July 20–22.
- ASCHAUER, D. A., (1990). Is Government Spending Stimulative?, *Contemporary Economic Policy*, 8 (4), pp. 30–46.
- AZARIADIS, C., LAHIRI, A., (1997). Do Rich Countries Choose Better Governments?, Working paper, Department of Economics, UCLA.
- BARRO, R. J., (1990). Government Spending in a Simple Model of Endogenous Growth, *Journal of Political Economy*, 98, pp. 103–125.
- BARRO, R. J., (1995). Inflation and Economic Growth, *Bank of England Economic Bulletin* 35, pp. 1–11.
- BARRO, R. J., (1996a). Democracy and Growth, *Journal of Economic Growth* 1, pp. 1–27.
- BARRO, R. J., (1996b). Determinants of Economic Growth: A Cross-Country Empirical Study, NBER Working Paper, No. 5698, Cambridge, Mass.: National Bureau of Economic Research.
- BARRO, R. J., (1997). Determinants of Economic Growth: A Cross-Country Empirical Study, Cambridge, MA: MIT Press.
- BENHABIB, J., SPIEGEL, M. S., (1994). The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data, *Journal of Monetary Economics*, 34, pp. 143–173.
- BRUMM, H. J., (1997). Military Spending, Government Disarray, and Economic Growth: A Cross-Country Empirical Analysis, *Journal of Macroeconomics*, 19, pp. 827–838.
- CHOWDHURY, A. R., (1991). A Causal Analysis of Defense Spending and Economic Growth, *Journal of Conflict Resolution*, 35, pp. 80–97.
- COZIER, B., SELODY, J., (1992). Inflation and Macroeconomic Performance: Some Cross-Country Evidence, Working Paper, No. 92–06, Ottawa: Bank of Canada, Department of Monetary and Financial Analysis.
- DEVARAJAN, S., SWAROOP, V., ZOU, H-F., (1996). The Composition of Public Expenditure and Economic Growth, *Journal of Monetary Economics*, 37, pp. 313–344.
- DRURY, A. C, KRIECKHAUS, J., LUSZTIG, M., (2006). Corruption, Democracy and Economic Growth, *International Political Science Review*, 27 (2), pp. 121–136.

- HARRISON, A., (1996). Openness and Growth: A Time Series, Cross-Country Analysis for Developing Countries, *Journal of Development Economics*, 48, pp. 419–447.
- HSIEH, E., LAI, K. S., (1994). Government Spending and Economic Growth: The G-7 Experience, *Applied Economics*, 26, pp. 535–542.
- KAUFMANN, D., AART, K., MASTRUZZI, M., (2003). Governance Matters III: Governance Indicators for 1996–2002, World Bank Policy Research Working Paper, No. 3106, Washington, D.C.
- KIM, H., (1996). Trade-offs between Military Spending, Quality of Life and Economic Growth, *Comparative Economic Studies*, 38, pp. 69–84.
- KLEIN, T., (2004). Military Expenditure and Economic Growth: Peru 1970–1996, *Journal of Defense and Peace Economics*, 15, pp. 275–287.
- KORMENDI, R. C., MEGUIRE, P. G., (1985). Macroeconomic Determinants of Growth: Cross-Country Evidence, *Journal of Monetary Economics*, 16 (2), pp. 141–163.
- LIM, D., (1983). Another Look at Growth and Defense in Less Developed Countries, *Economic Development and Cultural Change*, 31, pp. 377–384.
- LIPSET, S. M., (1959). Some Social Requisites of Democracy, *American Political Science Review*, 53, pp. 69–105.
- LIPSET, S. M., (1960). *Political Man: The Social Bases of Politics*, New York: Doubleday.
- MATSUYAMA, K., (1992). Agricultural Productivity, Comparative Advantage and Economic Growth, *Journal of Economic Theory*, 58 (2), pp. 317–334.
- MAURO, P., (1995). Corruption and Growth, *Quarterly Journal of Economics*, 110, pp. 681–712.
- SACHS, J. D., (2001). Tropical Underdevelopment, NBER Working Paper, No. W8119.
- SACHS, J. D., WARNER, A. M., (1995). Natural Resource Abundance and Economic Growth, NBER Working Paper, No. W5398.
- SACHS, J. D., WARNER, A. M., (1997). Sources of Slow Growth in African Economies, *Journal of African Economies*, 6, pp. 335–376.
- YANIKKAYA, H., (2003). Trade Openness and Economic Growth: A Cross-Country Empirical Investigation, *Journal of Development Economics*, 72, pp. 57–89.

APPENDIX**Complete Panel of 126 Countries:**

(D, D* and LD represent countries used in the analysis as developed countries, developing countries and least developed countries)

Albania(D*), Algeria(D*), Angola(LD), Argentina(D*), Armenia(D*), Australia(D), Austria(D), Azerbaijan(D*), Bahrain(D), Bangladesh(LD), Barbados(D*), Belarus(D*), Belgium(D), Belize(D*), Bolivia(D*), Bosnia and Herzegovina(D*), Botswana(D*), Brazil(D*), Brunei(D*), Bulgaria(D*), Cambodia(LD), Cameroon(D*), Canada(D), Chile(D*), China(D*), Colombia(D*), Costa Rica(D*), Cote d'Ivoire(D*), Croatia(D*), Cyprus(D), Czech Republic(D), Democratic Republic of Congo(D*), Denmark(D), Dominican Republic(D*), Ecuador(D*), Egypt(D*), El Salvador(D*), Estonia(D), Ethiopia(LD), Finland(D), France(D), Georgia(D*), Germany(D), Ghana(D*), Greece(D), Grenada(D*), Guatemala(D*), Guinea(LD), Haiti(LD), Honduras(D*), Hungary(D*), Iceland(D), India(D*), Indonesia(D*), Iran(D*), Iraq(D*), Ireland(D), Israel(D), Italy(D), Jamaica(D*), Japan(D), Jordan(D*), Kazakhstan(D*), Kenya(D*), Kosovo(D*), Kuwait(D), Kyrgyzstan(D*), Latvia(D*), Lebanon(D*), Lesotho(LD), Liberia(LD), Libya(D*), Lithuania(D*), Luxembourg(D), Macedonia(D*), Malaysia(D*), Mali(LD), Malta(D), Mexico(D*), Moldova(D*), Mongolia(D*), Montenegro(D*), Morocco(D*), Mozambique(LD), Netherlands(D), New Zealand(D), Nicaragua(D*), Niger(LD), Nigeria(D*), Norway(D), Oman(D*), Pakistan(D*), Panama(D*), Paraguay(D*), Peru(D*), Poland(D*), Portugal(D), Puerto Rico(D), Qatar(D), Russia(D*), Saudi Arabia(D*), Serbia(D*), Singapore(D), Slovakia(D), Slovenia(D), South Africa(D*), South Korea(D), Spain(D), Sri Lanka(D*), Swaziland(D*), Sweden(D), Switzerland(D), Tajikistan(D*), Tanzania(LD), Thailand(D*), Togo(LD), Trinidad and Tobago(D*), Tunisia(D*), Turkey(D*), Turkmenistan(D*), Uganda(LD), Ukraine(D*), United Arab Emirates, United Kingdom(D), United States(D), Uruguay(D*), Uzbekistan(D*), Venezuela(D*), Vietnam(D*), Yemen(LD), Zambia(LD).

List of Petroleum Exporting Countries:

Algeria, Angola, Australia, Bahrain, Brunei, Canada, China, Colombia, Gabon, Indonesia, Iran, Iraq, Kuwait, Malaysia, Mexico, Nigeria, Oman, Qatar, Russia, Saudi Arabia, Trinidad and Tobago, United Arab Emirates, Venezuela, Yemen.

List of Emerging Market / Countries:

Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Morocco, Peru, Philippines, Poland, Russia, South Africa, Taiwan, Thailand, Turkey.

List of Caribbean Countries:

Belize, Dominican Republic, Haiti, Jamaica, Puerto Rico, Trinidad and Tobago.

List of Asian Countries:

Armenia, Azerbaijan, Bahrain, Bangladesh, Brunei, Cambodia, China, India, Indonesia, Iran, Iraq, Israel, Japan, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, Malaysia, Mongolia, Nepal, Oman, Pakistan, Philippines, Qatar, Russia,

Saudi Arabia, Singapore, Sri Lanka, Tajikistan, Thailand, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan, Vietnam, Yemen.

List of European Countries:

Albania, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Moldova, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom.

List of American Region Countries:

Argentina, Barbados, Belize, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Trinidad and Tobago, United States, Uruguay, Venezuela.

List of African Countries:

Algeria, Angola, Cameroon, Cote d'Ivoire, Ethiopia, Ghana, Kenya, Madagascar, Mauritania, Mozambique, Nigeria, Rwanda, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

List of Muslim Countries:

Albania, Algeria, Bahrain, Bangladesh, Cote d'Ivoire, Egypt, Ethiopia, Gambia, Indonesia, Iran, Iraq, Kuwait, Lebanon, Libya, Malaysia, Morocco, Niger, Nigeria, Oman, Pakistan, Qatar, Saudi Arabia, Tanzania, Tunisia, Turkey, United Arab Emirates, Yemen.

List of Tropical Countries:

Angola, Belize, Bolivia, Botswana, Brazil, Brunei, Burundi, Cameroon, Colombia, Cote d'Ivoire, Ecuador, El Salvador, Ethiopia, Gabon, Gambia, Ghana, Grenada, Guatemala, Guyana, Haiti, Honduras, India, Indonesia, Jamaica, Kenya, Kiribati, Liberia, Macau, Madagascar, Malawi, Malaysia, Mali, Mexico, Mozambique, Nicaragua, Niger, Nigeria, Oman, Panama, Papua New Guinea, Peru, Puerto Rico, Singapore, Sri Lanka, Tanzania, Thailand, Trinidad and Tobago, Uganda, Venezuela, Vietnam, Yemen, Zambia, Algeria, Australia, Bangladesh, Chile, China, Egypt, Paraguay, Saudi Arabia, United Arab Emirates.