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A Dynamic Perspective Of Macroeconomic Stability, Macroeconomic Conditions & Economic Growth: Evidence From N11 Countries

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Abstract

This study aims to analyze the long run relationship between macroeconomic stability, macroeconomic conditions and economic growth of next eleven (N11) countries over the period of 2009 to 2018. Study uses one proxy for measuring macroeconomic stability (inflation) and two proxies for measuring macroeconomic conditions (investments and trade openness). This study uses Pedroni residual cointegration test to investigate the dynamic long run relationship between endogenous variable (GDP) with exogenous variables (inflation, investments and trade openness). Empirical results affirm cointegration among understudy variables at second difference. This study is significant in understanding the role of macroeconomic factors in boosting economic growth of N11 countries. This research opens debate on the significant role of N11 emerging economies in enriching world economic performance.

Keywords: Macroeconomic stability, macroeconomic conditions, economic growth, next eleven countries, panel cointegration

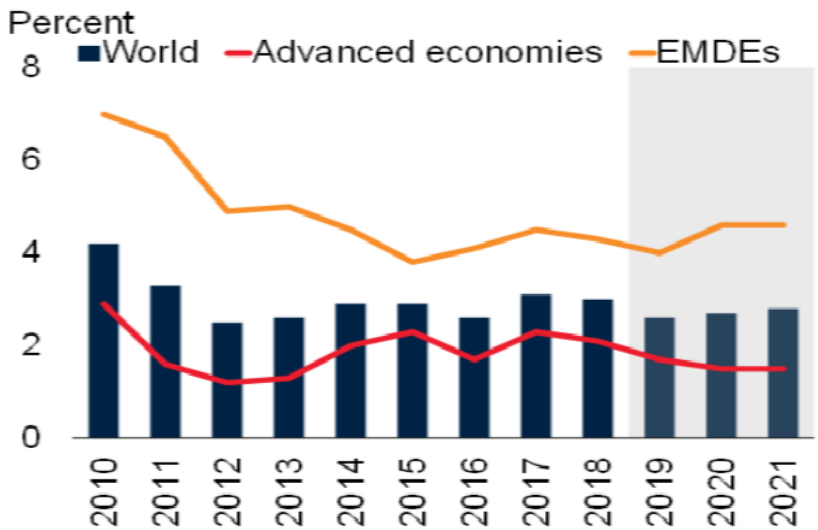
Introduction

The basic challenge for economics is to understand the nature and causes of economic progress (Ali & Rehman, 2015)**.** As in many developing countries, the primary focus is to have high and sustainable economic growth, if not sufficient, condition for boarder development, enlarging the scope for individuals to be productive and creative. It creates the resources to support education, and other Millennium Development Goals (MDGs) to which the world has committed

itself. (Anyanwu, 2014)**.** One of these MDGs is to develop a global partnership for development that is, developed nations help middle and low income countries in trade

openness and financial system, good governance, poverty alleviation, reducing debt problems, human development and technological innovation that lead towards boosting their economic growth and development. Policy makers and economists are much interested in sustainable level of economic growth and are much worried in downward movement of economic growth.It is therefore important to highlight the basic challenge that is to understand the nature and causes of economic progress (Ali & Rehman, 2015).

Stronger and steady economic growth is essential for improving the living standards of any nation.Global growth has been downgraded to 2.6% during the first half of the year 2019 due to tightened trade policies, recent pressure on financial markets of emerging and developing countries that slowdown trade since global financial crisis. Global economic growth was projected to be 2.7% in 2020 (World Bank, 2019).



Source: (World Bank, 2019)

The BRICS countries (Brazil, Russia, India and China) are considered as innovation building blocks in the global economy and among the leading emerging economies. BRICS are wealthier economic power and covers almost 40% of world's population and accounted for more than 25% of global GDP. Brazil and Russia are considered to be world's dominant suppliers of raw material whereas; India and China are considered to be world's dominant suppliers of manufacturing goods and services due to low production cost. The concept of BRICS acronym came back in 2001 in order to highlight the remarkable role and importance of emerging and developing economies (Bosupeng, 2017; Stiglingh, Muzindutsi, &Bezuidenhout, 2018; Younsi&Bechtini, 2018; Guru & Yadav, 2019). Later on, Sachs, O'Neill, Wilson, Purushothaman, and Stupnytska, (2005) explored the potential of BRICS countries and hence introduced N11

countries, the idea of a larger set of countries that were likely to develop on a slower route than the BRICs would, but could still become world power. A group of next eleven countries includes Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, Turkey, South Korea and Vietnam.

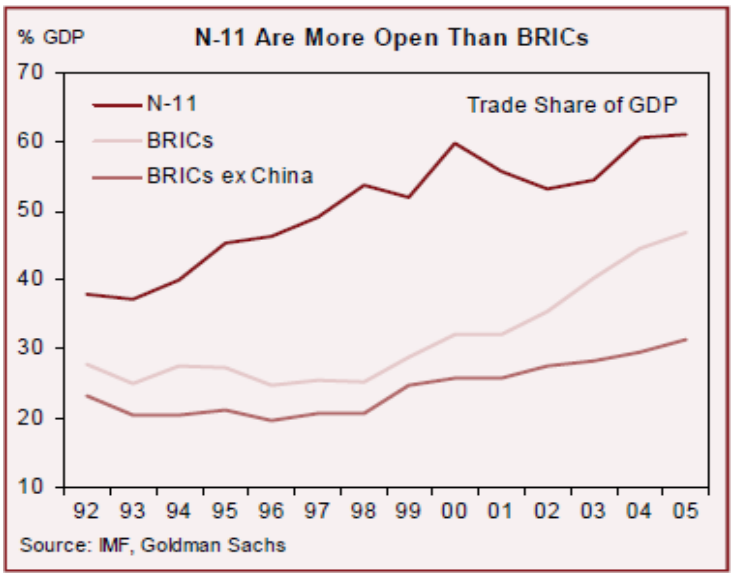


Figure 1.2: Comparison of BRICs and N11

Figure 1.2 shows the upward trend comparison of BRICs and N11 economies performance during the period of 1992 – 2005, where Goldman Sachs in 2005 highlighted these next eleven countries potential to have more trade share of GDP in comparison to BRICs nations. Hence, on the basis of this analysis, projected and excepted performance of next eleven is determined. Economic liberalization is a major driving force behind globalization. In the last century, one of the important developments is the integration of national economies into a global economic system (Ortiz-Ospina, Beltekian, &Roser, 2018). Fundamentally, macroeconomic stability, and macroeconomic conditions open up a nation to the rest of the world in context with international trade, regulations, commencement and expansion of businesses and other areas that generally enhance economic growth.In order to sustain economic growth, a nation needsto maintain the right set of conditions for growth to achieve its potential. A key task for investors in accessing growth potential is to judge how well countries are doing in keeping those essential and critical conditions in place.For that, nations need to formulate appropriate policies to promote economic growth. But unfortunately, in recent decades no developing country has achieved significant economic success (International Monetary Fund, 2018).It is noted that author did not find any research which incorporated all complete set of next eleven

countries that examines objective measures of economic growth, however very few studies either targeted any one or some of the countries within N11 group (Peasah & John, 2016; Muye & Muye, 2017; Bist & Bista, 2018; Ayuba & Khan, 2019). This study will contribute in relevant literature with a special focus on N11 countries. In the research literature the debate is still open on macroeconomic determinants on economic growth but in the light of current scenario, this study focuses on a set of eleven countries that are considered to be world power in 21st century and identified as potentially good investments in coming years. Where, emerging and developing economies growth is constrained by sluggish investment and rising trade barriers (World Bank, 2019). This study is significant for government, policy makers, investors, economists, researchers and students. This study will help in determining structural changes ina group of N11 countries as a whole and at each individual level and setting policies forboosting economic growth. In research literature, very few studies either targeted any one or some of the countries within N11 group (Peasah& John, 2016; Muye&Muye, 2017; Bist&Bista, 2018; Ayuba& Khan, 2019).
Following are the objectives of research:

- To examine a long run relationship between inflation and economic growth of N11 countries.
- To examine a long run relationship between investments and economic growth of N11 countries.
- To examine a long run relationship between trade openness and economic growth of N11 countries.

Section I gives a general background of the study. Section II entails a supporting literature on understudy variables with a special focus on the relationship between the variables. Section III discusses the data and methodology. Section IV entails data analysis and interpretations. Lastly, section V provides conclusion and recommendations.

Literature Review

Research studies on impact of various macroeconomic factors have been focused comprehensively since decades. Social scientists and economists have debated the significance of economic growth especially in underdeveloped and developing nations. Back in 2005, Sachs, O'Neill, Wilson, Purushothaman, and Stupnytska come up with a group of middle income economies who have potential to become a world power by 21st century, boost global economic growth and are considered to be next BRICs countries. Goldman Sachs extensively reviewed literature, exclusively Robert Barro's influential research in examining and selecting factors that have significant relationship and relatively have robust effect on economic growth in various cross country growth regression. Goldman came up with five main objective

measures (macroeconomic stability, macroeconomic conditions, technological capabilities, human capital and political conditions) that have significant impact on economic growth. Where as, this research will primarily focus on the two objective measures that are, macroeconomic stability and macroeconomic conditions. Following are the relationships reviewed found in literature.

Achieving sustainable economic growth and development is a major concern for all countries. (Mweni, Njuguna, & Oketch, 2016). Economic growth is the increase in the capacity of an economy to produce goods and services, compared from one period of time to another. (Raisova&Durcova, 2014).Across the world, raising sufficient funds to finance government projects is a major concern. No country has adequate resources to meet all its budgetary needs. Implementing major policies, particularly in developing countries remain a major challenge. Many world economies are characterized by low capital formation and a shortage ofresources to meet increasing public expenditure (Shafi, Hua, Idress, & Nazeer, 2015).

High and sustained economic growth with low inflation is the central objective of the macroeconomic policy makers. Macroeconomic stability exists when key economic relationships are in balance—for example, between domestic demand and output, the balance of payments, fiscal revenues and expenditure, and savings and investment (Ames, Brown, Devarajan, &Izquierdo, 2001). Inflation is found to have serious implications for growth and income distribution (Ayyoub, Chaudary, & Farooq, 2011). However, relationship between inflation and economic growth depends on the state of the economy. High growth, without an increase in inflation, is possible if the potential output of the economy is growing enough to keep pace with demand. High inflation is correlated with increased price variability, which can lead to uncertainty about the future profitability of investment projects. As a result, it leads to conservative investment decisions, lower level of investments and economic growth (Ruzima, 2016; Akinsola & Odhiambo, 2017; Enu, Attah-Obeng, & Opoku, 2013)

Economic factors that influence the state of the whole (aggregate) economy, including changes in employment levels, gross national product (GNP), and prices (deflation or inflation). High acquisition multiples and the end of cheap financing had a significant impact on firms (Stowell, 2013).Capital formation is one of the numerous factors of economic growth. It consists of large scale projects (including construction of roads, irrigation channels and waterways or measures are taken in health care) in order to economic activity and trade carried out (Gibescu, 2010). Gross fixed capital formationrepresentsthe value of the durable goods (tangible and intangible assets) for non- military purposes, purchased by the resident producing units to be used at least one year in theproduction process, as well as the value of services incorporated in fixed capital goods. According to Ibe and Nathaniel(2016), there is significant positive relationship between capital formation and economic growth both in short run and long run in Nigeria. Fluctuations in the economy revolve around certain tendencies in which development is determined by the

interaction between revenue and investment size (Stupnikova & Sukhadolets, 2019). It is highlighted that the government should encourage savings, create conducive investment climate and improve the infrastructural base of the economy to boost capital formation and hence promote sustainable growth.

Besides there are various other factors that affect economic growth. Some studies used inflation index, debt ratio to GDP, Industrial material price index, foreign direct investment, fertility or morality rate, oil price index, agricultural sector contribution to GDP, copper prices, macroeconomic stability exchange rates and many more (Shabbir, Anwar, & Adil, 2016; Anyanwu, 2014; Akinsola & Odhiambo, 2017; Edward, 2018; Ndlovn, 2013). Financial sector plays vital role in economic development. Financial sector is basically a financial intermediation that efficiently using public savings into productive investments. Credit to financial sectors means a credit provided to the private sector in a form of loans and advances that helpcompanies to make investment and earn profits. This flow of credit or finance helps in boosting financial sector of a country that have a significant impact on economic growth(Olowofeso, Adeleke, & Udoji, 2015; Mamun, Ariffin, & Hamid, 2018). A wealth of literature supports a positive and significant infleunce of financial system on economic growth (Bongini, Drozdowska,Smaga, & Witkowski, 2017; Aljebrin, 2016). The impact of financial market especially stock market development on economic growth relationship has been focused extensively in 20th century (Hoque, 2017).

Whereas, on another side, a debate on the popoulation growth and economic growth is remain controversial. It has been examined that more economic and social problems arise in those high income countries which have low population growth while low income countries are foundto have slow development process with high population growth (Peterson, 2017). There are positive effects of population growth including economies of scale, market expansion, innovation, improved skills, ideology and creativity. But relationship between population growth and economic growth varies country to country (Koduru & Tatavarthi, 2016).

Endogenous Growth Theory

Economic theory is to define the economic behavior of any individual or a nation/society as a whole through constructing economic models. Paul Romer and Robert Lucas in 1980s proposed new economic growth theory (also known as endogenous growth model). Theory explains long run growth rate on the basis of internal factors that is economic growth is primarily caused by internal factors instead of external factors. Followed by Romer in 1986 and Lucas in 1988, endogenous growth model had become a great interest in determining long term growth determinants. Paul Romer gave an argument and proved that besides technological transformation, government policies in research and development investment, and intellectual property laws fuel consistent economic growth. Moreover, more investment in human capital

development results in educated labor and skilled workforce, more training and knowledge, increased capital investment, more attractive investment opportunities, increase in jobs, better health conditions, opportunities for new businesses and expansion of businesses across the boundaries of a nation.

Data and Methodology

This research is quantitative in nature. This research investigates a long run relationship between endogenous variable (economic growth) and exogenous variables (macroeconomic stability: inflation and macroeconomic conditions: investments and trade openness) through a Pedroni Residual Cointegration Test. In addition, population size and market capitalization are taken as control variables. Secondary source data is extracted from World Bank indicators database over the period of 10 years that is, 2009- 2018.

Various statistical tests are applied for examining under study variables including firstly, panel unit root testthat is Levin, Lin & Chu test (2002), and Im, Pesaran, and Shin W-stat test (1997) are applied. Jarque-Bera test is applied to test normality of residuals. Durbin Watson test is examined for testing the autocorrelation. Pedroni's residual cointegration test is used in this study for investigating a long run relationship between understudy variables. Three criterians including Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan- Quinn information criterion (HQ)are used.

The most general panel model equation is as follows:

$$Y_{it} = \alpha_i + \delta_i t + \gamma_t + X_{it}\beta_i + €_{it} \quad \ldots\ldots(1)$$

Above equation represents a time series panel observables including $Y_{it}$and X_{it}. Both parameters are assumed to be integrated at order one that is I (1) under the null hypothesis of no cointegration.

t = 1,....., t is the time index,

$€_{it}$ = a random disturbance term,

N = n × T data points.

T is a time, i refer to the study country, α_i and $\gamma_t$parameters show a possibility of specific fixed effects and deterministic trends over any given period of the panel.

To investigate the long run cointegration correlation between the study variables, following is the assumption:

H_o: $\theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = 0$ (There is no cointegration)

H_a: $\theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq \theta_6 \neq 0$ (There is cointegration)

Data Analysis and Interpretations

This study has one endogenous variable that is GDP, two exogenous variables including macroeconomic stability (inflation) and macrocosmic conditions (investments and trade openness)and two control variables including market capitalization and population size. Table 1 shows a descriptive analysis of study variables. Results reveal that the GDP found to have more volatile behavior when compare to its mean value. Most of the macroeconomic variablesusually have this volatile behavior due to diversified culture over the period of time.

Table 1: Descriptive Analysis

	GDP	Inflation	Investments	Trade Openness
Mean	1124.131	6.863836	28.53882	41.78271
Maximum	1698.263	11.39517	31.23492	48.11092
Minimum	702.2644	5.423472	26.20606	35.30400
Std. Dev.	325.4749	1.745645	1.567983	4.333280
Skewness	0.427724	1.608824	0.065657	0.129004
Kurtosis	1.841629	4.716860	2.126234	1.556278

Figure 1: Test for Normality of Residuals

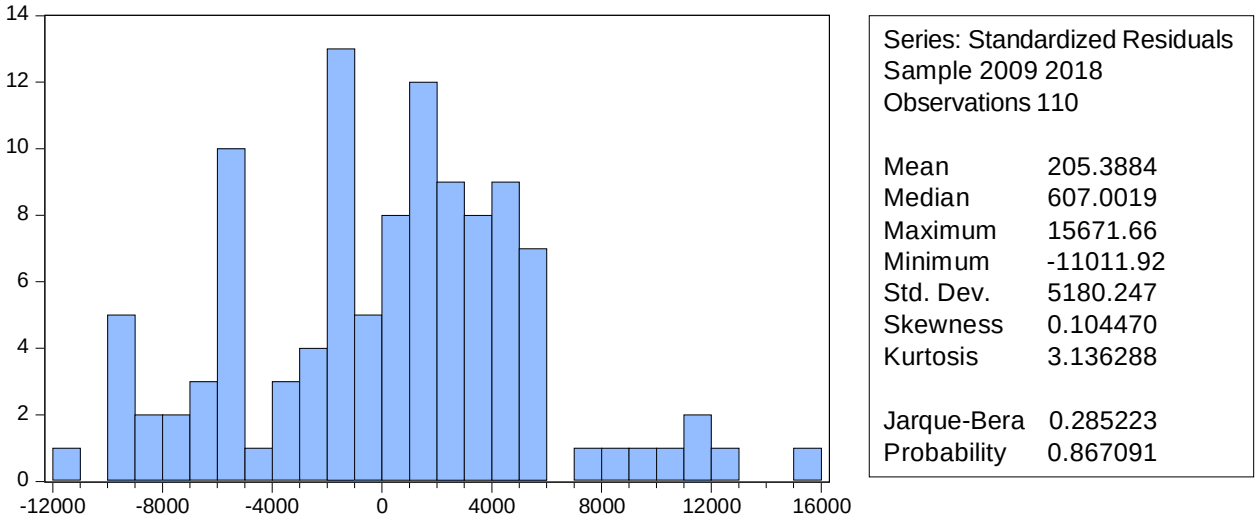


Figure 1 shows the normality of residuals test via Jarque-Bera test. Null hypothesis of Jarque-Bera test is a normal distribution of residuals. Above figure shows a Jarque-Bera value is0.285223 with a P-value of 0.867091 (that is greater than 0.05) affirms normality of residuals in a dataset.

Following Table 2 shows regression results by panel least square method.

Table 2: Regression Results

Method: Panel Least Square			
Dependent Variable: GDP			
Sample: 2009-2018			
Cross-sections included:110			
Total Panel (balanced) observations: 1100			
Variables	**Coefficient**	**Standard Error**	**Prob.**
Inflation	4.5391	2.057881	0.0276
Investments	296.5437	3.559941	0.0000
Trade Openness	-27.5522	0.542245	0.0000
Population Size	-4.12E	7.01E-07	0.0000
Market Capitalization	3.5135	0.672729	0.0000
R squared : 0.9550			
Adjusted R-squared: 0.9549			
Durbin-Watson Stat: 1.4937			

Regression analysis shows a relationship between endogenous variable (GDP) and exogenous variables (Inflation, Investments and Trade Openness) during 2009 to 2018. It has been observed that all variables have P-value less than 0.05 indicating that all variables have significant impact on GDP. Results showed that all exogenous variables bring 95% variance proportion in GDP of N11 countries over 10 years time span. Moreover, Durbin Watson value is 1.4937 shows no autocorrelation in the dataset.

Table 3: Panel Unit Root Test on GDP

Panel Unit Root Tests				
	At Difference		**At First Difference**	
	Statistics	**Probabilities**	**Statistics**	**Probabilities**
Levin, Lin & Chu	-2.46515	0.0068	-5.55075	0.0000
Im, Pesaran and Shin W-Test	-0.08680	0.4654	-2.02512	0.0214
ADF – Fisher Chi-square	30.0170	0.1181	38.1293	0.0177
PP - Fisher Chi-square	44.6448	0.0029	44.8222	0.0028

Table 3 shows different panel unit root tests including Levin, Lin & Chu, Im, Peasaran and Shin W-Test, ADF-Fisher Chi-square and PP-Fisher Chi-square for the stabilization of studied time

period. It is observed that the selected sample is statistically significant and stationary at first difference with P-values less than 0.05.

Table 4: Panel Cointegration Test Results

Pedroni Residual Cointegration Test						
Dependent Variable: GDP						
Sample: 2009 2018						
H_0: No Cointegration						
Lag Selection Criterion	**SIC**		**AIC**		**HQ**	
	Statistic	**Prob.**	**Statistic**	**Prob.**	**Statistic**	**Prob.**
H_1: Common AR coefs. (within-dimension)						
Panel v-Statistic	-2.160655	0.9846	-2.160655	0.9846	-2.160655	0.9846
Panel rho-Statistic	4.468998	1.0000	4.468998	1.0000	4.468998	1.0000
Panel PP-Statistic	1.158953	0.8768	1.158953	0.8768	1.158953	0.8768
Panel ADF-Statistic	-2.707959	0.0034	-2.707959	0.0034	-4.651168	0.0000
H_1: Individual AR coefs. (between-dimension)						
Group-rho Statistic	5.108351	1.0000	5.108351	1.0000	5.108351	1.0000
Group PP-Statistic	-5.681893	0.0000	-5.681893	0.0000	-5.681893	0.0000
Group ADF-Statistic	-7.840687	0.0000	-7.840687	0.0000	-8.198071	0.0000

Table 4 shows panel cointegration method output of N11 countries from 2009 to 2018. Econometric results reveal that five out of eight tests in each lag selection criterion (SIC, AIC and HQ) are statistically significant with P-value less than 0.01, 0.05 and 0.10 at level 2. It is found that there is a cointegration correlation among GDP, inflation, investments, trade openness, population size and market capitalization of N11 countries over a ten period time span 2009 to 2018.

Conclusion

The main objective of this study is to examine the cointegration relationship among endogenous variable (GDP) and exogenous variables (inflation, investments and trade openness) of N11 countries over a time period of 10 years 2009 -2018.Data analysis and

econometric results found statistically significant relationship and cointegration among all variables. This study revealed a long run relationship between understudy variables in N11 countries. Macroeconomic factors play a significant role in boosting GDP of any country, hence stabilizing price, highcapital investments and effective trade policies or sum of exports and imports need to be focus for necessary economic performance. Hence, macroeconomic stability and macroeconomic conditions in each nation can drive economy as a whole that lead to world economic growth. This study is beneficial to policy makers, economists, researchers and academia to highlight the significance and make appropriate polices to ensure meeting target world economic performance. Keeping in mind, the main aim behind introducing a new set of countries, further research should be conducted on other factors including technological advancements and political factors on N11 countries.

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