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# Trade Openness, Foreign Direct Investment and Infrastructure Spending: A Comparative Analysis of Their Common Role in the Economic Development Between Selected Developed and Developing Economies

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**Trade Openness, Foreign Direct Investment and Infrastructure Spending:**  
**A comparative analysis of their common role in the economic development between**  
**selected developed and developing economies**

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(TITLE)

BY

**Yasser M Alwafi**

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**THESIS**

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
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**Master of Economics**

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IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY  
CHARLESTON, ILLINOIS

**2017**

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YEAR

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**Trade Openness, Foreign Direct Investment and Infrastructure Spending:  
A comparative analysis of their common role in the economic development  
between selected developed and developing economies**

### **Dedication**

This thesis is dedicated to my parents Mohammad and Nejat, who taught me that even the largest task can be accomplished if it is done one step at a time and for their endless love and continued confidence, encouragement, and patience through my entire life. I also dedicated it to my siblings, Manal, Ella, Marwh, Malak, Ahmad and Abdallah who always supported me and been there for me when I need them.

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## **Abstract**

This study examines the literature on how trade, foreign direct investments, and infrastructure development affect economic growth of selected developed and developing economies. A comparative analysis will be carried between developed economies (G7 countries) represented by Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States while the developing economies (BRICS countries) are represented by Brazil, Russia, India, China and South Africa. The comparative analysis will be carried between years 1985 to 2015. In addition, the paper will establish the relationship between trade and economic growth in both developing and developed economies. Furthermore, the paper will establish that trade variables in both developed and developing economies is captured in three indicators namely, the sum of exports and imports to the Gross Domestic Product (GDP), the ratio of imports to the GDP and the ratio of exports to GDP.

This study utilizes a panel data approach to form and capture the threshold effect between economic growth and trade. Moreover, the relationship between Foreign Direct Investment (FDI) and economic growth will be analyzed. The research will depict that trade and FDI are expressed as the ratio of GDP in both developed and developing economies. In addition, the co-relation between the FDIs and the GDP rate is inherent to the volume of investments brought into the host country. Moreover, the relationship between infrastructure represented as GCF and economic development in both developing and developed economies will be discussed by this proposal. The proposal will establish that infrastructure outputs such as power, transport, and water are used as production inputs in productive sectors such as manufacturing and agriculture, therefore forming a close relationship between GDP and

infrastructure. The study will conclude by establishing the relationship of the three variables (trade liberalization, FDI and infrastructure spending) in economic development in both developed (G7 economies) and developing economies (BRICS economies).

## **INTRODUCTION**

Developed and developing economies depend on trade, FDI, and infrastructure to spur their economic growth. The differences between the economic growth paths can be attributed to the volumes of investment in these three variables. The relationship between trade and development has dominated the debate in development economics and trade. Developed economies carries out more trade more thus have a high economic growth path compared to underdeveloped economies. The study is conducted to find out whether there exists a long run relationship between trade and economic growth. The study also determines if trade and economic growth are co-related since their relationship is fortified by the stability in macroeconomic policies. From the analysis, some negative macroeconomic variables such as inflation can constrain economic growth. Developed economies have embraced openness to trade which plays a crucial role in economic growth. In addition, the reduction and elimination of barriers to trade promote trade growth thus ultimately raise the GDP of the developed economies. Empirical evidence indicates that there is a trading threshold that exists between trade openness and economic growth. Developing countries must have more effective policies towards openness to trade in particular when controlling a level of imports thus boosting their economic growth through international trade.

Although there may be no considerable evidence link between the FDI and economic growth, FDI may be a recipe for economic growth in both the developed and developing

economies. FDI's are expected to boost the host economic growth, it's evident that the extent of FDI growth depends on country-specific characteristics. In particular, the FDI tends to promote economic growth of host countries with liberal trade regimes such as developed economies. Moreover, developed economies tend to be a pro trade openness and improved education, therefore, human capital conditions encourage export-oriented FDI to maintain macroeconomic stability. Developing economies policymakers should focus on strategies and policies that promote economic growth thus attracting FDI inflows into their regions. Empirically, the FDI boosts the host economy via accumulation of capital by an introduction of new goods and the subsequent introduction of foreign technology thus enhancing the stock of knowledge in the host country through the transfer of skills. Developed countries benefit from the FDI by the increasing capital and technical spillovers. In addition to that FDI represents the potential source for sustainable growth and development given its ability to assist in human capital development and formation, generate spillovers in technology, and assist the host countries integration to global trade. Furthermore, the developed economies ensure the existence of competitive business environment thus enhancing the development of FDI enterprise.

FDI inherent to developed economies complemented the domestic savings by conferring foreign savings. The developed economies balance of payment receipts is augmented since the FDI fills the funding gap between the investment requirements and the local savings. According to the United Nations Conference on Trade and Development (UNCTAD), FDI has proven to be a stable source of funding since it is based on the long-term view of the growth potential of the recipient nation, access to wider markets and accessibility of raw materials. Therefore, as a result, individual countries have been seeking

policies that attract FDI. Developing economies should seek FDIs to spur economic growth thus reducing macro-economic detrimental effects such as poverty.

Infrastructure forms the base in which Economic growth is realized. Infrastructure encompasses the roads, water, mass transport, airports, and utilities. Infrastructure aids support services to help grow productive sectors such as agriculture and industrialization. The pro-founding relationship between infrastructure and economic growth is quite complex. Although infrastructural development is necessary and an important form of economic growth and industrial take-off, the desire for a country's growth is not directly proportional to higher or an increased need for infrastructure. In developed economies, infrastructure exhibits high network effects. As the number of users increases, the marginal productivity of infrastructural investments increases. In addition, the spread of networks surpasses the average productivity inherent to investment until the market is all saturated.

Developing economies still lag behind in economic development due to decades of economic stagnation, poor living standards and sometimes environmental disasters which have left infrastructural development underutilized. Investment in infrastructure as a GDP proportion is about 10% in comparison to 16% in unindustrialized countries. In addition, less than 50% of the region's roads are paved. In addition, about 1/3 of the population of the region are within two kilometers of the seasoned roads in comparison to 2/3 in developed economies regions of the developed economies. Telephone penetration in developing economies is about 14% in comparison to an average of 52% in developed economies. Developing economies lack resources to undertake infrastructural development. In addition, they lack reliable data to determine manpower and finance for infrastructural development. Many developing economies lack the infrastructural development framework that may guide



them to achieve economic development. Moreover, the developing economies exhibit inadequate planning which mismatches societal needs and requirements. On the other hand, developed economies have well-functioning supporting institutions and stable political environments.

Developing economies need to save annually by eliminating all inefficiencies and also carry 100% capital budget execution. The relationship between infrastructure and economic growth is two-way. First, infrastructure creates growth in the economy and economic growth brings infrastructural changes. On the other hand, practically in both the developed and developing economies, infrastructure provides the keys to all modern technology in all sectors. Studies have also depicted that around 9% of the value added is contributed by infrastructure in developing countries, while 11% comes from the high-income economies. As income levels rise, so as the composition of infrastructural changes. In developing economies, basic infrastructure such a water, irrigation and transport grows fast and is of high demand. In high-income countries, power and telecommunications are of more importance. Empirical studies have shown that 20% increase in public investment in infrastructure accelerates real economic growth by 1.8% in the medium to long-term.

## **LITERATURE REVIEW**

The empirical literature on trade and economic development became predominantly important in the 1980s. In 1982 many developed economies faced debt crises and economic meltdown, diluting the impact of trade protection. The empirical literature suggests the positive relationship between trade and economic growth of both developing and developed economies. Makki & Somwaru (2004) investigated whether trade spurs economic growth and found a positive relationship. A further analysis by Rodriguez & Rodrik (2000) revealed that

the relationship between economic growth and exports in four developed and four developing economies using the error correction and co-integration model. Their findings depict a stable long-run relationship and a bi-directional causality relationship between economic growth and growth of exports. In addition, the favorable expansion of balance of trade is dependent on efficient management of imports and market-oriented institutions of competitive market strategies for expansion of exports. Trade liberalization increases a country's level of competitiveness and production efficiency in the domestic sector. Blanchard & Leigh (2013) argues that trade liberalization benefits the economy through efficient resource allocation inherent to social marginal costs and benefits thus opening access to better technology and production inputs. Therefore, developed and developing economies can take advantage of economies of scale thus providing favorable growth.

According to the theory of comparative advantage, if a country wishes to trade with another country, the country produces the goods it has the comparative advantage on. The latter is deemed to specialize in the sector it has better factor endowments in, thus producing the goods on a large scale. As results, exports and productivity will rise boosting the overall economy. Blanchard & Leigh (2013) argues that trade liberalization encourages countries to specialize in sectors in which they possess high economies of scale thus promoting productivity and efficiency in the long run. Moreover, the new model suggests the positive relationship between trade openness and growth of economies is a result of advanced technologies as denoted by Blanchard & Leigh (2013). Developed economies have a higher degree of openness thus possess a greater ability to use the technologies generated to grow more rapidly.

Developing economies, on the other hand, have a sluggish growth which is facilitated by their poor technology standards. However, the opposite argument depicts that trade openness may be damaging to economic progress. This occurs in the case a country specializes in development and research activities which are not the core of the country economic activities. Moreover, the composition of trade in goods terms matters a lot in determining the growth effect. Empirical analysis has analyzed the relationship between trade and development bringing up mixed and conflicting methodologies in both developing and developed economies. The study carried out by Czinkota & Ronkainen, (2013) confirm that economic growth is positively affected by trade. On the other hand, Johnson (2013), suggests that there is a weak relationship between economic growth and openness to trade. Johnson (2013) further suggests that lower-income countries benefit more from international trade than the developed economies. In a study of four developed economies and developing economies, the report shows a positive correlation between trade openness and economic growth. However, below the threshold level, trade have detrimental effects on economic growth as witnessed in Brazil (a developing economy).

Shahbaz et al. (2009), found no causal relationship between economic growth and exports in Brazil. However, the findings have been challenged by Zecchini (2013), who confirmed the trade led growth hypothesis for Brazil. Shahbaz et al. (2009), apply the quartile regression as an indicator of exploring the trade growth nexus for developing nations. Their results are a clearer indication that trade openness is higher and robust in developing countries than in developed economies. Moreover, using the instrumental variable regression to examine the effects of trade income variation with economic development, the results indicate that trade openness has a profound positive impact on financial development,

economic growth and capital accumulation in developed economies (Makki & Somwaru, 2004). On the other hand, trade openness also has a profound impact on economic growth and real income. In both developed and developing economies, the real effect of trade depends on inflation and financial development. The openness of trade has a negative effect on growth in countries with low financial development in the long run and in the short run. The causal relationship running from trade openness suggest that trade openness stimulates both investment and economic growth. Besides, the trade policies such as the real effective exchange rate and the tariff rate affect the country's economic performance through trade. In a more recent work, the instrumental variable approach depicts that trade openness increases economic growth in both long run and the short run since the investment ratio has a positive impact on the economy in a short run.

Foreign direct investment (FDI) has been viewed as power influencing on economic growth directly in the recent past. A number of researchers examining the relationship between FDI and economic growth depict that FDI and economic growth relationships are significantly positive. Within this scope, there exist several influencing factors such as human capital, well-developed financial markets, open market regimes and the complimentary domestic and foreign investment. In the 1990s, FDI was the principal source of flow in developing nations. FDI, unlike other capital inflows, has a fewer degree of volatilities. Thus, typically does not follow the economy's pro-cyclical behavior. Studies have shown that FDI has increased since the late 1980s to 2000s worldwide. The World Trade Organization (WTO) postulates that FDI occurs when an investor in the home country acquires assets into the host country with the intention of managing the asset. The management aspect distinguishes it from the portfolio investment in bonds, stocks and other

financial instruments. Studies by Shahbaz et al. (2009) depict that FDI inflows are the basic policies that support developing economies over the last two decades. In addition, the Brussels Declaration and Program of Action for the LDCs' (BPoA), 2010 depicted that foreign exports demand is more essential than domestic demand. Sbia et al. (2014) added that FDI is a major finance source thus it can facilitate technology entrance from advanced and developed economies to the host country. In a Keynesian setting, the net exports represent the country output external demand which can lead to improvement of the real output. There exist different channels between exports and FDI growth. On the basis of the hypothesis, the outward looking economies are bound to experience higher growth rates. Oatley, T. (2015) FDI enhances the production efficiency and promotes specialization and productivity inherent to the host nation. In addition, FDI improves managerial experience, job skills, employment, exports markets and tax revenues. Egger & Pfaffermayr (2004) employed a fixed panel data approach to examine the effects of trade and FDI on the real growth of per capita GDP in developed and developing nations. In their analysis, they found a significant positive effect of FDI to trade in developing economies. In addition, when controlling the effect of domestic trade and investment, FDI posed a positive impact. The study of Oatley (2015) investigates the casual relationship between FDI inflows and economic growth in developing economies using the Granger causality test and the bounds test. When the real GDP was postulated as the dependent variable, the bound test suggests some level of relationship between the FDI and the real GDP. In the long run, the result indicated the unidirectional causality from GDP growth to FDI. Moreover, Hsiao & Hsiao (2006) carried out Granger causality tests between exports, GDP and FDI in developing nations using panel data and time series for the last decade. Empirical analysis depicted that each country has a

different causality relation, while the results of the Panel-VAR causality depicted that FDI has an effect on GDP indirectly and directly through exports. In addition to that, there also exists a bi-directional causality between GDP and exports. The analysis also depicted that exports may be a good substitute if not complementary to human capital or financial development through its relationships with FDI and the GDP. Oatley, T. (2015) determined the effect of FDI on macroeconomic indicators such as GDP, export, and employment within developing economies. The results indicate that FDI had a negative impact due to a low level in rural investments. Borensztein, De Gregorio & Lee (1998) studied the effect of FDI on economic growth in a cross-country regression by using data from developing industrial economies. The results indicate that FDI is an important driver in technology transfer which contributes more to economic growth and development more than the domestic investment. The empirical evidence stated that higher productivity in FDI is possible when the host country has a minimum human capital threshold stock. Also, the findings depict a bidirectional casualty between FDI and GDP. A study carried out by Rodan (2016) examined the role of trade and FDI for developing nations. The findings depicted that FDI, Trade, domestic investment and human capital are important sources of economic growth and development. In addition, they found a strong interaction between trade and FDI in realizing economic growth.

Infrastructure has the profound role into a country economic growth and trade. One approach to determine the measure the impact of trade facilitation is the gravity model which assess the impact of trade facilitation measures on bilateral trade flow. Snieska & Simkunaite (2009) assessed the impact of four trade indicators related to economic growth which included, Information Communication Technology, physical infrastructure, transport

efficiency and telecommunications. Physical infrastructure had the greatest impact on exports. Other studies that have utilized the gravity model lay a strong emphasis on the role of infrastructure on trade. Bilateral trade flows in developed economies are affected by transport infrastructure and Information Communication Technology. Studies have shown developing economies have less developed roads and port, poorly performing customs agencies and weak regulatory capacities. In addition, they have limited access to business and finance which affects trade thus affecting economic growth adversely. Snieska & Simkunaite (2009) found that improving port and airport efficiency positively impacted trade and thus accelerating economic growth. Empirical studies suggest that differences in transport costs between the developing and developed nation account for different inability to compete in international markets. Roller & Waverman (2001) suggest that better transport and infrastructural services improve international access to markets thus increasing trade with respect to economic development. Adopting the study from Snieska & Simkunaite (2009), the role of infrastructure in clothing, automotive and textile factors is major trade input determinant. The incorporated bilateral tariff, the quality of roads and airport affect the turnover period of goods and services. The study proved that infrastructure was key companioned in development of trade with respect to economic growth in both developed and developing economies.

### **RELATIONSHIP BETWEEN TRADE AND ECONOMIC GROWTH**

The relationship between trade and economic growth has been a point of debate since Adam Smith's discussion of specialization. Adam Smith postulated that economic growth can be derived from trade in the form of import substitution versus export led growth (Panayotou,



2016). In addition, that he investigated the effects of trade on standards of living exhibited by citizens in developed and developing Economies. Evidently, the trade policies play a crucial role in facilitating economic growth. Trade may affect household incomes through specialization arising from realizing comparative advantage, realization from returns of economies of scales, technological spillovers from investments, improved communication channels, exposure to new services and goods, new production methods and new ways of organizational behavior. The relationship between trade and economic growth should be evaluated on the long run since it permits deviations occurring in the short run when variables adjustments for equilibrium occur. In the long run, all equilibrium values and formulations are based on variables equilibrium. In the recent past, there have been growing of theoretical evidence in developing and developed economies in growth of trade and the impact on economic growth and development (Johnson, 2013).

Developing economies have been struggling to come up with a comprehensive review of key issues that link trade and economic growth. According to the World Development Report (2012), trade is a powerful tool through which globalization gains can be distributed amongst nations since as the economies grow, the trade becomes more open as suggested by Erokhin & Heijman (2014). Should the developing nations relax exchange controls thus increasing more investment opportunities? The increase in investments (either direct or indirect) increase a country economic growth. Investment activities are facilitated by creating opportunities for trade and also creating an enabling an environment that can attract foreign investors and multinational companies. However, the benefits of trade depend on nature of goods, production, and domestic economic policies.

The dynamic and the static gains made from trade arises from the theory of



comparative advantage, the effect of trade on a level of investment and the state of technical know-how of a country. Erokhin & Heijman (2014) stipulated that trade can promote economic growth through technology spillovers and expanded external trade. An endogenous economic model demonstrates the importance of knowledge accumulation and the importance of technological progress in developed economies; this implies, that there is a need for continuous accumulation of technological growth for sustained economic growth in the long term. The model postulates long run growth can be attributed from diffusing technology and knowledge. Taylor (2007) presented the model with trade policy and economic growth, popularly known as the two-gap policy, which defines the poor economic growth in the developed economies. Using Data from Brazil, productivity per capita increased from 2% to 3% every financial year in the ratio of trade to Gross Domestic Product, therefore, confirming the interdependency between economic growth and trade. Johnson (2013) found a robust two chain link between trade and economic growth in developing economies. The study revealed a robust correlation between the share of investment in GDP and economic growth. Similarly, Oatley (2015) estimated a growth model using GDP as the dependent variable and trade variables as the explanatory variables. The result of the model suggested that trade volumes are a function of economic growth, however, macroeconomic variables such as the real exchange rate strongly influence imports and exports directly. In addition, he also found that investment affects economic growth directly and investment is affected by trade policies. He also found that trade liberalization is crucial in bringing the positive relationship between economic growth and trade in developing economies.

The quality of economic growth is brought up by the proportions of exports and the quality of output. A country's export is the main source of income and the engine of a

country's growth since a successful export drive stimulates a positive trade multiple on the economy. Exports can improve the growth in developed and developing economies GDP by increasing incomes and raising employment in the export sector and in the technological development. As Egger & Pfaffermayr (2004) postulates export is a key item in promoting economic growth.

On the other hand, imports are linked to the economic growth although the two are competing effects of supply and demand. On the demand side, imports are termed as leakages as they are the constraint to economic growth. On the other hand, the exports constraints are eased with trade liberalization policies coupled with the efficiency gains on the supply side. Critics confirm that the empirical evidence that imports and economic growth are complementary is inconclusive and mixed. Economists argue that if the increased GDP is the source of finance for imports growth can be constrained, thus having a negative impact on economic growth (Egger & Pfaffermayr, 2004).

#### **a. The Link between Trade Openness and Long-Run Economic Growth**

For decades, economic debates about the performance have divided countries into two categories: performers and the non-performers. Increasingly, the ability of an economy to provide decent living standards for its citizens has become a major topic in this debate. Driven by some underlying causes, some economies have high income levels while others have a low-income level. Since the first publication of the Adam Smith's paper about the growth of nations, living standard as a product of sustained additions to per capita of GDP is increasingly recognized (Menyah, Nazlioglu & Wolde-Rufael, 2014). While living standards

are a basic measure of what countries experience in form of GDP and its variables, it is important to take the long-term divergence brought by the long-term growth rates into the economic equation.

The relationship between trade openness and economic growth have been investigated widely, yielding to inconclusive and mixed results. The differences between the results may be attributed to an omission of labor and capital stock in the trade and growth matrix. The impact of trade openness on economic growth is examined in the multivariate framework that includes labor, trade openness and capital stock as the regressors (Erokhin, Ivolga & Heijman, 2014). Additionally, this concept also uses the Yamamoto-Granger Causality test in the regression model. The regression result depicts that trade openness has positive effects on the economic growth in both the long run and the short run. Further, there is a real positive relationship between the openness of trade and formation of capital in promoting economic growth. Evidently, the openness of trade promotes economic growth but some studies support both negative and positive impact. A study carried out in Brazil (a developing economy) and Canada (a developed economy) reveal that there is a positive and complementary relationship between capital formations promoting economic growth and trade openness (Ahmed, 2013). The result can be useful in analyzing trade policies and economic growth in other developed and developing nations. Further, the study also confirmed that economic growth is stimulated by trade openness. Moreover, it has shown that in the long run, trade openness can enhance economic growth by easing access to goods and services thus achieving efficiency in resource allocation and also by improving total factor productivity through knowledge dissemination and technology diffusion. Therefore, it's expected that countries that embrace trade openness are bound to outperform those with less

open policies. From this angle, developing countries have much to gain from trading with technologically advanced countries.

The international community and donors recommend trade liberalization policies to developing economies in a bid of opening them and integrating them into the global market. The policies are driven by the failure of the import substitution strategy. Findings from empirical studies that depict a more outward and progressive economies record higher economic growth rates. The spectacular economic growth of developed economies such as USA and Canada can be partially attributed to their early trade openness. Surprisingly in the early 1900s, many developed economies have adopted trade liberalization policies such as reduction of import and export tariffs and also the introduction of non-tariff barriers (Anyanwu, 2014). On the contrary, another school of thought argues that trade openness may be detrimental to the economic growth of the country by increasing the rate of inflation and by lowering exchange rates (Belloumi, 2013). Further, trade openness may bring negative impacts to the economy for developing countries which specializes in low-quality export products. For instance, a county exporting primary consumer products are vulnerable to trade shocks.

Despite this, the general belief is that international trade is beneficial to economic growth and development. Besides, the real effective exchange rate and the tariff rate affect the country economic performance through trade. In a more recent work, the instrumental variable approach adds evidence that trade openness increases economic growth in both long run and the short run since the investment ratio has a positive impact on the economy.

Significant growth rates are associated with countries embracing ongoing globalization and increasing openness to international trade. In a study of four developed

economies and developing economies, research shows a positive correlation between trade openness and economic growth (Agrawal, 2015). However, below the threshold level, trade may have detrimental effects on economic growth as witnessed in Brazil (a developing economy). Panayotou (2016) finds no causal relationship between economic growth and exports in Brazil in his case studies. Trade openness was the primary source of growth in many developing economies in East Asia such as China and Singapore (Hsiao & Hsiao, 2006). It is certain that international trade facilitates technological developments.

The comparative advantage theory has been advanced by another economist such as A. Kruger who stipulates that trade liberalization is the main driver of liberalization in sectors for a country exhibiting economies of scale thus contributing to the efficiency in production and efficiency in the long run (Agrawal, 2015). Also, Rodan, G. (2016) argues that trade liberalization benefits the economy through efficient resource allocation inherent to social marginal costs and benefits thus opening access to better technology and production inputs. Therefore, developed and developing economies take advantage of economies of scale to provide favorable growth. The new growth models postulate the positive relationships that exist between economic growth and trade openness's a result of emission of new technologies (Simionescu, 2016). Developed countries with high degree of openness have thus the ability to use new technologies, therefore, allowing them to grow faster than countries with low level of technological advancements (Roller & Waverman, 2001). The cost of technology imitation also matters in the trade and growth relationship. Roller & Waverman (2001) further explains that if the cost of imitation on innovation in poorer countries is lower in developing economies, then their economies will expand at a faster rate. Therefore, this study postulates that developing economies are poised to grow faster than

technologically advanced economies. As pointed out above, some economists argue that openness to trade can be detrimental to economically challenged nations. The disparity occurs in countries where development and research are not core sectors. In addition to that, trade composition matters in a country's growth effect. Moreover, the economic growth of a country matters in the ease foreign technologies have been mastered and subsequent adoption in the local environment. Some studies confirm a negative impact of trade on levels of income. A study done in the Harvard school of business denotes that lower income countries stand to benefit more than high-income countries (Roller & Waverman, 2001).

Malik & Awadallah (2013) used the instrumental threshold arrangement to establish whether trade- income varies with economic development. This study depicts that there exists a long relationship between trade and economic growth. In addition, trade and economic growth are co-related, but their relationship is fortified by the stability in macroeconomic policies. From the analysis, some macroeconomic variables such as inflation can constrain economic growth. Developed economies have embraced openness to trade which plays a crucial role in economic growth. Empirical results depict that openness to trade has positive effects on the accumulation of capital, financial development and economic growth in the developed economies, however, While Trade openness has had a positive impact on the economic growth of developed economies it may exhibit negative effects on developing an economy (Zecchini, 2013). In addition, the real effect of trade depends on the level of inflation and also the level of financial development. Trade promotes economic growth and development in low inflation, non-agricultural and high-income countries. Trade openness also enhances the stock market efficiency. Zecchini (2013) further argues that economic development is dependent on the performance and development of the stock market. Trade is

enhanced when the country reaches the threshold of development in the stock market, thus both in the short and long run, openness to trade increases a county economic growth.

#### **b. Trade Volumes or Trade Policies?**

The integration of developed and developing economies into the world economy is often as an important factor in determining the differences in incomes and growth. Whether a country picks trade volumes or definitive trade policies to shape its relationship between trade and economic growth over the long term remains a question that economists have fumbled with for quite long. Trade is believed to be a channel through which allocation of resources is done efficiently, allowing a country to realize economies in terms of scope and scale. Trade volumes facilitate the diffusion of technology and knowledge at a larger scale, facilitating the technological progress in a given economy. On the hand, trade policies are definitive in nature-guiding the process of technological diffusion, competition in the local and international markets for production optimization.

Although a country may increase its trade volumes in international trade policies are significant in enhancing trade openness. Economist confirms that trade liberalization has a positive impact on economic growth. Some developed and developing economies have identified a positive relationship between economic growth and trade openness while other countries have not. There some disparity between economists when it comes to trade policies adopted. when performing an analysis of the long-term trade policies effects on economic growth, there is a profound difference regarding policy conclusions. Empirical studies have depicted whether a trade policy is viable and if it is significantly good for economic growth (Panayotou, 2016). According to some economists, economic growth is brought about by the accumulation of resources (human and physical resources), improvements in technology,



investments in efficient public infrastructure and innovation of a new series and products all brought about by international trade (Snieska & Simkunaite, 2009).

A number of research studies have found that the effect of trade policies on the economic growth to be controversial. Matthias & Jens (2012) argue that lowering of different trade barriers fosters international trade by sheer reduction of transaction costs, which directly enhances economic growth rates due to minimized transaction costs. BRICS economies are opened up to the world as a result of such policies and would be better positioned to absorb technology developed in the G7 and other developed economies. Matthias & Jens (2012) further explains that the growing economies would also need to adopt some of economic protectionism. In their infant industries, there would be a need for protection of development taking place such that this becomes beneficial in the long run.

Market imperfections exist in almost all forms of economies. Trade policies can be formulated as responses to these market imperfections and in some cases as special mechanisms of rent seeking. Rodriguez & Rodrick (2000) postulates that although there have been numerous challenges in empirical analysis of the effects of trade policies, numerous studies in developed economies have shown that existence of non-tariff barriers and price-distortion indexes as responses to market imperfections impact on economic growth depending on the level of economic openness.

There is a general statement referred to as the infant industry hypothesis advanced by the protectionists. The theory states that infant industries must be protected from foreign imports as an incentive to invest capital and learn to produce goods a more efficiently and In addition, the infant industries are protected so as to scale production, enjoy economies of scale and develop innovative products that can be exported. Virtually all developed and



developed economies found merit in embracing the protectionist idea, but on the other hand, it may be detrimental since it locks away the competition and also prevents technology emission.

Economists assume that countries grow faster if they are open to international competition. They prefer properly value rates of exchange. Thus, the exchange rates do not discriminate against exports or imports. This is achieved by flexible exchange rates that are allowed to move gradually to account for different inflation differences between the major export markets. In addition, they prefer removing taxes on export production. Rather than relying on infant protection of local industries, the developed economies should prefer export promotion in manufacturing and the high-tech sector by introducing rebates on imputed industrial products.

In some economies, changes of policies (depending on the specific policies) have had adverse effects on the general economic performance. Trade barriers such as tariffs and quotas do not only affect the growth of trade but also affect the competitiveness of manufacturing and industries offering services. In such circumstances, economies have been forced to change tact so as to sustain their economies. Trade volumes as a measure to counter adverse policies have been adopted by a number of developed and developing economies in a number of times.

BRICS economies such as South Africa, India and China have often resorted to increase their trade volumes in cases where a trade of specific commodity or a number of them have been hit by a quota or an increase in tariffs in the international markets (Wacziarg & Welch, 2008). By raising the volume of trade especially in the international markets, an economy is always in a position to gain more due to increase in production of a specific

product that is in question. Wacziarg & Welch (2008) has a number of studies across the growing economies such as Brazil, India and China shows that due specialization of a particular commodity, increase in trade volume of this commodity or service comes with a number of benefits. Trade volumes raises productivity due to specialization, leading to efficient allocation of resources, economies of scale and capital accumulation.

The global value chain is built on the need for specialization, resilience and resistance to shock especially in times of adverse economic policies. China underwent such times in the late 1900s and early 2000s. During this time, a number of international bans were placed on the Chinese goods in the international markets, leaving China with fewer options. Amiti & Freund (2010) explains that China presents a classic example of an economy that was built on trade volumes rather favorable trade policies in the 1990s and 2000s. In the backdrop of trade bans and quotas, resorted to specialization of in the line of electronic products and technology. As a result of the increased allocation of resources in these fields, China was able to allocate more human and capital resources in production. High volatility in other industries further catapulted the electronic and technology industries in China during this time. As Amiti & Freund (2010) show in the literature, trade volumes became an important tool for the Chinese economy. As a result, China was able to move up the global value chain driven by the volumes of trade from electronic and technology.

In the study of the economic performance, the real GDP is often regarded as the dependent variable with trade policies and trade volumes as the independent variables. While most of the research work carried out by Busse & Koniger (2012) confirms the presence of data availability as a limitation, regression analysis was used as a major test on the data for developing and developed economies to assess the impact of trade volumes and trade policies

on the GDP. The regression analysis on the datasets confirms relationships between the trade volumes and the GDP for the years under examination. Busse & Koniger (2012) affirms that there is a negative relationship between the trade in goods and services in developed economies, suggesting that there a marginal effect of service trade on the real GDP. The research work further affirms a positive relationship between the trade volumes and the real GDP in developed countries. The correlation between trade volumes and real GDP is moderate in developing countries mainly because the economic systems are not as pronounced as compared to the developed economies. Depending on the datasets from the trade policies in question, the correlation between economic policies and the real GDP varies for the developed and developing economies (Busse & Koniger, 2012). Favorable economic policies tend to encourage the growth of the GDP. Unfavorable economic policies such as economic sanctions, quotas on certain goods in international markets and tariffs on imports and exports tend to undermine the growth of GDP in the long term depending on the target quarters.

### **RELATIONSHIP BETWEEN FDI AND ECONOMIC GROWTH**

The relationship between FDI and economic growth in the respective economies is one of the never-ending economic debates. There are economists who argue that FDI is one of the factors driving economic growth while others do not agree with this school of thought. A number of economic literature agrees to believe that FDI directly boosts the economy of the host country. The primary mechanisms for such external facilities are the importation/adoption of foreign know-how and technology, which the host country gets via licensing partnerships, employee training, emergence of new processes, imitation, new

products by the foreign organizations; and the establishment of links between the local/domestic and foreign firms. These benefits, coupled with the direct financing of the capital it generates, implicate that Foreign Domestic Investment can directly contribute to modernizing the economy of the host nation and fostering its development (Alfaro, et al., 2006). However, it is worth noting that the empirical marker of the existence of such externalities of positive productivity appears to be sobering.

The era of globalization is with us, and this means that there has been a growth in the free movement of goods by the global companies. Production of the goods is carried by the multinationals in the developed countries and then these goods are sold in the developing and emerging markets. As a result of the transactions in the global markets, vast sums of foreign direct investments flow into the developing economies. In the recipient economies, these investments are treated as capital accumulations, used to finance different projects. In cases where these growing economies are in a position of attracting more FDIs, they develop domestic trade and economic policies to stimulate the growth of FDI over time. The result is the promotion of financial and non-financial sector development, ensuring that there is a conducive environment for more foreign investments in their domestic economies.

**a. Does FDI Cause Economic Growth?**

FDI provides the fundamental building blocks and ingredients necessary to spur growth in an economy. When multinationals produce and export products and services from developed to developing economies, there is a transfer of goods and services. By providing these capital ingredients to the developing economies, new production equipment, techniques, processes, technology and managerial skills are transferred into the respective recipient economies (Samad, 2009). In addition, some capital goods are also transferred in the

process of international trade. This spillover from the multinationals to their subsidiaries in the emerging economies, ensure that there is a conducive production environment by making all factors of production and skilled management available. Over time, the spillover of technology ensure that the developing countries build a capacity to sustain their production processes and technology without the over-reliance from the developed economies (Samad, 2009).

An investigation of the correlation between FDI and the economic growth of recipient economies has a policy and strategic implications for the emerging economies. Samad (2009) postulates that if a causal relation may exist between the FDI and economic growth, it means that sustainable economic growth is a prerequisite for attracting, sustaining and absorbing the FDI. In this case, the domestic economy needs to put more emphasis on the sustainable economic growth in the long term as compared to attracting and sustaining the foreign investments. Samad (2009) further explains that if a unidirectional causal link exists, then FDI does not only provide capital formation for the recipient economies but also provide sustainable growth in the long term for these developing economies. In the event of a bidirectional correlation, then FDI and economic growth co-exist and reinforce each other at all the times.

In a study to establish the relationship between foreign direct investment and economic growth from 1994 to 2012. Almfraji & Almsafir (2014) held that, in theory, FDI directly impacts economic growth through the accumulation of capital, and the deployment of new technologies and foreign inputs in the production processes of the host nation. Empirically, endogenous and neoclassical models of growth have been extensively used to test the theoretical benefits that come with FDI. Although most results lean towards a positive

relationship between the neoclassical and endogenous economic parameters, others do not conform to that reality. The reasons include the selected techniques of estimation (such as OLS, Error correction, Co-integration, and Granger Causality models); sample selection (such as developed [G7-countries] versus less developed [BRICS] countries), and the selected timescale against the methodology of estimation (time series against cross- section) (Almfraji & Almsafir, 2014, p. 208).

Almfraji & Almsafir (2014), conducted on 69 less-developed nations between 1970 and 1989 using a cross-country regression, they found that inward foreign direct investment has a positive impact on economic growth through interacting with human capital. They also found that the FDI provided more benefits to economic growth than domestic investment, and it increased domestic investment. They suggested the equations of economic growth are extremely sensitive/prone to human capital proxies. For a panel framework of data for 18 countries from Latin American from 1970 to 1999, they found a positive impact from FDI is only achieved when the host country liberalized capital markets and human capital had attained a sufficient level of stability. In another analysis of a panel data for 84 nations for the same period, they found that FDI produces both direct and indirect impact on economic growth if it interacts with human capital (Almfraji & Almsafir, 2014, p. 209).

Complementarity between foreign and domestic investments reveals the nature and impact of the foreign investment dependence. Economies with a high dependence on the foreign investments, economic growth tends to be slower as compared to the economies that rely on domestic investments (Narula & Driffield, 2012). Almfraji & Almsafir (2014) argues that FDI has an initial positive impact on the recipient economy acting as the driver of

economic growth due to the accumulation of capital, technology, and manpower. However, in the long term, reliance on foreign investments exerts a negative downforce on the growth. This is mainly because institutions and infrastructural projects that are developed by the foreign investments support further FDI in form of capital and manpower. As more capital and manpower flows into the domestic economy, negative externalities shape up; unemployment, income-inequality, and over-urbanization take root.

Long-term growth in the FDI-recipient economies is determined by the spillovers of knowledge and technology as well as the rate of spillovers from the investing economies. Two factors play a critical role in determining the economic growth driven by FDI – substitution between domestic and foreign investment and complementarity effect between the two. Almfraji & Almsafir (2014) demonstrated no correlation effect between FDI and growth based on a cross-section of data drawn from an OECD population sample- concluding that economic growth benefits may only be restricted to developed countries (countries with a high-income level). This means that countries with a high-income level had a more positive FDI effects as compared to their low-income level and developing counterparts. Using the same data sample, Almfraji & Almsafir (2014), demonstrated that a political and trade regime plays a very important role ensuring that the FDI benefits are transmitted into the domestic economy ensuring economic growth.

FDI and economic growth relation has proved that FDI has positive effects on the host's economic growth. However, there are few cases where FDI has negative or no effects on the recipient's economic growth. To fully understand the effects of FDI on developing and



developed economies, several compounding factors ought to be cross-examined in detail. From the literature and research work have done, it has been found that well-developed financial markets, a host of human capital and open trade and economic regimes contribute positively to FDI-economic growth causal link. Some level of foreign investments further positively compounds this relationship while extreme dependency causes negative externalities.

#### **b. The link between FDI and economic growth in G7 countries**

The following is a review of the link between FDI and economic growth in the G7 countries. The relative performance of Canada in attracting FDI inflows proves to have exceeded its overall standard economic weight on the global scale. The evidence for this argument is the fact that the UN World Investment Report has ranked Canada as the world's 4<sup>th</sup> to 7<sup>th</sup> top destination for FDI since 2000, while its GDP has been between the 8<sup>th</sup> and 11<sup>th</sup> highest performing economy over the same period (Moloney & Octaviani, 2016, p. 14). Moloney & Octaviani (2016) further explains that Canada's international FDI share is also larger than that of its GDP.

In a research to investigate the relationship between FDI and economic growth in the European nations (EU-28), Simionescu (2016) stated that FDI produces both positive and negative impacts on the economy of the host nation. Using both Bayesian techniques and Panel data approach, he found that France is one of the 18 European nations where FDI produces a positive influence on the economic growth and the GDP rates positively impact FDI. He also added that FDI flows are integral to the consolidation of the Single Market in



the European Union. He also projected that investments from the other countries across the world in the European Union would improve Europe's caliber in the global markets as well as enable it to enjoy the influx of foreign technologies (Simionescu, 2016, p. 201).

In the case of the United Kingdom, the LSE Growth Commission Report (2017) stated that openness to foreign trade and international talent underwent several changes, particularly during the 1980s and 1990s which facilitated a steady growth of the economy. Particular, the country eased the restrictions on both foreign direct investment during the 1980s and on migration towards the end of 1990s. In another study by Banks et al. (2016), the researchers found that the share of the assets of FDI owned by the UK held in the European Union has dropped from year to year since 2001. The return rates on direct investments in both the EU and other countries across the world have also undergone a similar experience over the same period. On the contrary, the stock value of foreign investment in the UK has been on the rise for all foreign regions, including the EU which has also enjoyed a surge in the rate of return on their FDI assets in the UK (Banks, et al., 2016).

While FDI inflows through cross-border Mergers and Acquisitions could increase productive investments, several deals that the several countries stroke in 2015 were underlined by corporate reconfigurations and tax inversions. Often such reconfigurations require large movements in balancing payments but contribute little to no change in the multinational operations. This trend proved especially apparent in both the US and UK, alongside other European countries. It was also noticeable in several developing countries (UNCTAD, 2016, p. 3). FDI flows to Europe and North America recorded large leaps in the same year. In North America the surge in foreign investment, which registered a 160% rise to \$429 billion, was steered by over 250% growth in FDI flows to the US. Although comparing

the 2015 value to that of 2014 would prove skewed due to the low levels of global FDI flows that year (2014), the \$380 billion that the country generated from FDI inflows in 2015 represent the highest value since the turn of the millennium (2000) (UNCTAD, 2016, p. 4). With \$13.4 trillion in FDI stock in 2015, the TTIP (Transatlantic Trade and Investment Partnership) initiative, Germany takes the second spot in the list of the G20 largest holders of FDI in 2015. It also received 46% of the global FDI flows even though the group generated just a smaller proportion of the world GDP. From a broad perspective, FDI flows to G20 countries grew by 106% in 2015 to about \$819 billion, partly due to a huge increase in inflows to the US and selected European Union nations such as Netherlands, Belgium, Ireland, France, and Germany) (UNCTAD, 2016, p. 9). despite the economic constraints that troubled East Asia in 2015, Japan remained one of the top investing countries in the world; it became second only to the United States. Figure 8 shows Japan's rank in the top investing nations worldwide.

### **c. The link between FDI and economic growth in BRICS countries**

Foreign direct investment (FDI) inflows in Brazil are sizeable but did not fully cover the current account deficits of 2014. In addition to that, the composition of the country's FDI inflows has transformed. In particular, the country's portion of loans to affiliated firms, which the IMF considered as FDI, substantially rose in 2014. This advancement, which is also commonplace in many developing market economies, has led to Brazil taking a cautious approach in some issues of economic growth, because such loans are less stable than equity FDI, and contribute to the vulnerability of the economy to external shocks (OECD, 2015).

From 1995 to 2002, FDI operations in Russia were less developed, falling short of the foreign investments in Poland, the CEE region's largest recipient nation, the Czech Republic, and Hungary. However, the country significantly improved this sluggish trend after 2003. As a result, the average value of foreign direct investment inflows in Russia between 2003 and 2011 stood at \$16.2 billion per year. This figure was \$12.5 billion higher than the country's yearly average of \$3.7 billion generated from 1995 to 2002.

Raising the FDI (Foreign Direct Investment) cap from 26% to 49% in both pension funds and insurance sector. Permitting FDI flows up to 100% under the automatic manufacturing of healthcare facilities and medical devices. Boosting the thresholds of FDI inflow projects that need upfront approval and worth \$306.3 million to \$765.8 million. Removing the sub-ceilings that bar the development of foreign investments such as FDI, non-resident Indians' investments, venture capital, and portfolio. Allowing partly paid warrants and shares as eligible capital tools to enhance the establishment of India's FDI policy.

Moreover, India also introduced a robust strategy for FDI liberalization and relaxed FDI regulations in about 15 "major production sectors", including civil aviation, defense, manufacturing, construction, mining, and agriculture (UNCTAD, 2016, p. 91).

Just like India, China also several changes to its FDI regulations. For example, it allowed foreign firms to start up bank card clearing firms and reduced several restrictions on foreign ventures in the country's real estate market. China also permitted ownership of e-commerce businesses by foreigners and used Beijing for a pilot project of starting up some service sectors. Moreover, the country also revised the *Catalogue for the Guidance of Foreign Investment Industries*, in which it stipulates the industries in which it can "encourage",

“restrict” or “prohibit” foreign investment. Unlike the old version, the current Catalogue slices the number of restrictions on investment, particularly in the country’s manufacturing sector (UNCTAD, 2016, p. 90).

#### **d. Trends and Patterns of FDI Flow**

One of the world’s striking developments in the past twenty years is the remarkable growth of foreign direct investment on the global economic front. Some of factors that have contributed to the globalization of the world economy include trade liberalization, breaking of trade barriers, capital markets, technological advancements, and the increasing internationalization of ideas, goods or services, over the same period. This paper will examine the trends and patterns of FDI flow in two periods (pre-1990s) and (post-1990s).

##### **Trends and Patterns of FDI Flow: Pre-1990s:**

By 1880, *Singer Sewing Machine* became the first modern MNCs in world and was considered one of the world’s largest firms. It established many manufacturing plants around the world which prompted other firms to follow the suit, and by 1914 about 37 US companies had stationed their production facilities in at least two overseas locations. By 1913 the net worth of global foreign long-term investment had increased to \$44 billion from \$4 billion in 1864. The UK topped the list of creditor countries, accounting for nearly three-quarters of the total value of international capital growth up to 1900. Thereafter, the United States and Continental Europe took over the lenders list as its share in new investments dipped. At the same time, Germany and France, the two other heavy investors from Europe owned foreign assets worth \$5.8 and \$9 billion, respectively; while the US accounted for credits worth \$3.5

billion.

After the WWII, the industrial distribution process around the world sped up, with the War reshaping the pattern of international transfer of capital and made significant impacts on the overall landscape of global capital movement. Technological advancement in the communication and transport sectors as well as the fact that European nations and Japan needed capital from the US to fund reconstruction of the damages inflicted by the WWII, reversed the trend towards of FDI growth. In the 1970s, the world underwent rapid growth of several large industrial units which led to extensive international ramifications. Although a significant number of the MNCs had been operational for several years, their growth took shape during this period, in which they expanded both in size and global scope of their activities.

The 1980s saw significant advancements in global economies as companies from many countries expanded their global operations. With surges in both financial institutions and integration of markets, they introduced a unique wave of foreign direct investment. The world economy registered a strong recovery from the early 1980s recession, and the ensuing high rates of growth in both developing and developed countries, the global FDI flows increased faster than domestic investment and output. In the second phase of the 1980s, the tally of developed countries which later became remarkable outward investors surged with Japan emerging as one of the top outward investors. The increase in the number of cross-border M & As, spurred by the competitive and technological forces, also played an integral role in the growth of foreign direct investment around the world.

Total global FDI inflows increased to \$200 billion by 1989 from the \$61 billion it recorded between 1982 and 1986. At the same time, FDI inflows to developing countries

increased at an annual growth rate of 22% from \$19 billion in the first phase of the 1980s to about \$29 billion by 1989. The top five creditor countries also became the largest recipients, claiming 57% of the world FDI inflows during the 1980s. Their outflows also grew by 38% annually to hit \$202 billion by 1989. From 1980 to 1989, the US, UK, and Japan became the world's largest creditor nations.

### **Trends and Patterns of FDI Flow: Pre-1990s:**

International FDI flows, which rose in the second half of the 1980s, as result, the countries who promoted FDI continued to increase systematically during the 1990s. In general, FDI surged by about 22% in the early stages of the 1990s and by nearly 40% towards the end, faster than the other aggregates of the global economy, including trade, world production, and capital formation. Some of the factors that spurred global FDI flows to the higher levels (growing from about \$225 Billion between 1990 and 1995 to a world record of about \$1.5 trillion by the turn of the millennium) were global economic growth and the MNCs' response to technological advancements, international competition and trade liberalization. As a result, global inward FDI flows as a ratio of GFCF grew from 4.1% during the 1990-95 period to 22% by the turn of the millennium, while GDP also increased from 8.9% to 20% between 1990 and 2000. In addition, the industrial nations accounted for a large percentage of the growth in FDI flows, with their contribution to the world FDI rising from \$145 billion during 1990-1995 period to \$1 trillion by 2000.

Inward FDI flows to the developed nations rose from 3.6% to 25% between the 1990-95 to 2000, and from 8.1% to 17.1% between 1990 and 2000, as percentages of GFCF and GDP, respectively. Within the developed countries, the portion of the Triad (Japan, the

United States, and the European Union) in total global FDI inflow and stocks rose and fell within the 60-70% range. The European Union in FDI inflows into the Triad accounted for 40.3% in 1990, but it grew by 5.7% within the next decade to hit 46% by 2000. The US remained the top FDI recipient nation in the world as inflows hit \$300 billion by 2000 against \$40 billion that it accumulated in the early stages of the 1990s. Inflows to Japan rose moderately, and the total FDI inflows grew from \$1 billion between 1990 and 1995 to about \$8.3 billion by 2000.

During the 1990s, the tally of developing countries receiving a significant amount of inflows faced a huge surge and FDI was viewed as the largest provider of foreign capital for most of them. At the same time, their portion in global FDI inflows increased from 17.5% to 21.7% from 1990 to 2000, and from \$74 billion to a record value of \$237 billion between the 1990-1995 period and 2000. Inward FDI flows rose from 5.7% to 13.4% and from 13% to 30.9% between 1990 and 2000, as percentages of GFCF and GDP, respectively. The boom in investment flows to developing nations reflected the sustained growth of the world economy and increasing privatization and trade liberalization in these countries. The growing integration of the developing world into the MNCs' investment plans also contributed to the surge.

The increase of FDI flows to developing countries was not evenly distributed among groups and regions, with most inflows concentrated in about 15 host nations from Asia and Latin America. FDI flows into the Caribbean and Latin America contributed about \$22 billion in the early stages of the 1990s and grew by threefold in the second phase to reach \$95 billion by 2000. For example, FDI inflows to developing Asia increased from \$47 billion to a record value of \$133 billion between the 1990-1995 period and 2000. The rise in the



investment flows to these regions emanated from the strengthening of the positions of some developing countries, the introduction of regional corporations and the readiness of nearly all countries in the region to welcome FDI and upgrading their trade policies.

## **RELATIONSHIP BETWEEN INFRASTRUCTURE AND ECONOMIC GROWTH**

### **Developed Economies:**

In the past twenty years, the UK Government has extensively utilized PFI (private finance initiative) contracts to foster private infrastructure investment in both social and economic projects. Since PFI contract reports are included in a register, indicating that the annual spending under the current PFI contracts is about £10 billion per year, they comprise nearly £6 billion in service charges and £4 billion in capital repayments, including interest. Although tougher PF2 contracts were introduced to enable the infrastructure investment route to stay open while also providing the maximum value for the taxpayers, PFI contracts steadily dried up between 2014 and 2015. Only £0.7 billion of the projects reached the full financial closure in the same period. ICAEW (2016) predicted that the low levels of new PFI contracts are not likely to undergo any significant changes soon, given that future PFI projects in the current procurement are less than £1 billion.

Like other countries, the UK realizes that there is a need for improving its infrastructure. Kable (2017) stated that the Government of the UK has set aside a hefty sum of £200 million to improve the country's infrastructure. In particular, it will direct those funds to upgrading junctions, renovating roundabouts, and enhancing traffic signaling to diminish

traffic congestion. With half of the budget allocated for fighting traffic issues, the UK Government also plans to cater to other infrastructure needs. For example, the country has plans to upgrade two large projects designed to build a dual expressway in Newcastle.

In the United States, nearly all spending on wastewater, drinking water, and transportation infrastructure is carried out by the public. In 2014, local, state and federal governments spend about \$416bn on infrastructure investments (or about 2.4% of the GDP). For three decades, US infrastructure investments as a share of the GDP has undergone a steady and stable rise. In 2014, the biggest share of public infrastructure expenditure covered highways (\$165 billion), with mass rail and transit and water utilities trailing at a close range. Almost a quarter of the country's total infrastructure investments expenditures (about \$100 billion) was generated by the federal government; while the local and state governments produced a third of the sum (about \$300bn). Of the expenditures by the federal government about two-thirds covered new, upgraded, or renovated structures and equipment. While the local and state governments contributed to the same infrastructure as the federal spending, a bigger share of their expenditures covered maintenance and operations.

Even for a country that is as developed as the United States, infrastructure improvement seems inevitable. In fact, the collapse of the Interstate 35W Bridge over Mississippi River that occurred in Minneapolis on August 3, 2007, is a testimony to the fact that even the US needs to upgrade its infrastructure. Following that incident, the then president, Obama, argued that the United States needs to build what he described as "21<sup>st</sup> Century infrastructure" (stronger bridges, modern ports, the fastest Internet, and faster trains). Golson (2015) stated that fixing America's infrastructure should involve the following factors: Availing funds for highways, renovating falling bridges, constructing waterways, building ports, harbors, and

dams.

### **Developing Economies:**

Following thirty years of exceptional economic growth, China seems to be moving towards a lower but steady and likely more sustainable path of economic development. In November 2013, China released the reform agenda (Third Plenum) designed to help the country promote innovation and strengthen market mechanisms. It also set up the Fourth Plenum to enhance the use of the law in fostering strategies for economic growth. From a broad perspective, one can point out the primary challenges China faces, as well as the measures designed to help counter these shortcomings and establish a sustainable economic growth (KMPG, 2009). Below is a set of strategies that the country aims at using to expand its infrastructure investments

Currently, China can unwind the imbalances inflicting its economy, manage growth risks and avoid an abrupt slowdown to the economic development. Correction of prices in the country's housing market could slice the vacancy rates by improving the affordability of housing. Unless the guarantees to the state-owned enterprises are phased out, restructuring the industries facing excess capacity is likely to fail. However, removing them enables all firms to compete on a level ground with regard to public procurement, taxation, regulation, and finance. In addition to that, boosting market mechanisms would enhance allocation of capital resources for greener growth.

The development of the service sector and urbanization ensures economic growth. Studies project that about 100 million rural dwellers are likely to migrate to the Chinese cities by 2020, in which case the government has to extend the social security and public services

to the 100 million migrants currently living in the cities and renovate the shanty-town houses for the estimated 100 million citizens to relocate to the urban centers. These moves boost the economy-wide productivity and growth. As from 2013, the service sector has produced the largest share of the GDP. Therefore, the country needs to open up more sectors to enhance private investment.

Reforms of the training and education system, from early stages to adult learning, needs to expand to provide the relevant skill sets to all learners to meet the educational needs of a rapidly growing and changing economy. Promoting equal opportunities will help build the human capital needed for a knowledge-based economy.

The land resources need reallocation within the agricultural sectors to improve both rural incomes and productivity. Moreover, moving towards off-farm employment needs facilitation to enable the social welfare systems to provide a broader coverage of the households in the rural areas. rural land efficiency needs boosting to improve market-based pricing of fertilizer, water as well as upgraded farmers' education.

In the views of Vukeya (2015), infrastructure results in growth by reducing the cost of transactions, production, and consumption, thereby improving development outcomes and service provision. South Africa boasts better developed and modern infrastructure such as health facilities, roads, and educational institutions, among others designed in line with the same standards as in developed nations. According to the reports by the National Treasury (2012), National Planning Commission (NPC) of South Africa (2014), the emerging economies requires infrastructure investment equivalent to 25% of their GDP to register a significant rise in economic growth. However, South Africa's investment in infrastructure to GDP ratio is lower than the prescribed standard. As of 2013, the country's infrastructure

investment to its GDP ratio was 19.3%, which –although it shows a 4.4% surge from the 14.9% of 2000 – is 5.7% shy of the prescribed 25%. If it grows at the same rate it did between 2000 and 2013, then it will attain the prescribed level by 2030.

### **Trends in Infrastructure Investment**

Within eight years after the 2008 Global Financial Crisis (recession), investment funds has generated over US\$200bn to direct long-term capital into various infrastructure investments. Studies estimate that organizations have allocated nearly the same amount to boost infrastructure (Greiner et al., 2016). Organizations seek to make direct investments rather than do it through investment funds. The creation of specialist equipment and teams for investment has resulted in a steady rise in both the value and volume of infrastructure transactions in the past ten years. It has also led to a significant surge in asset valuations as the acquirers have tolerated lower yields on their investments.

One of the common charges associated with private sector investments is that they focus on generating profits, which can only be attained through reduced cost of maintaining assets and detriment of customer service. The vast majority of evidence in this case appears to lean towards the opposite – that is, private investors in infrastructure typically improves consumer services through the following measures. First, the private sector focuses on the need to compete (for the non-monopolistic infrastructures such as airports and seaports), which brings a shift in the strategy used to ensure customer satisfaction. Second, it may also use controllers to set price constraints and efficiency targets. In essence, controllers appear more suitable to the privately-owned companies than the public-owned one.

For example, the controller of water sectors in Wales and England (Ofwat), was able to reduce bills in actual terms by 5%, despite continued advancements in target service standards. According to Ofwat, organizations are set to invest over £44bn (or nearly £2,000 per household) by 2020 which will benefit customers from substantial improvements. The move by Ofwat has only been possible because the (private) investors desire to spend significant volumes of capital into the water industry to seek increasingly modest yields. PwC's analysis of funds generated since 2004 presents a downward trend in the return expectations from 14% to 10.6% in 2004 and 2016, respectively. Studies show that many managers take advantage of the (private) investors' desire to invest capital in infrastructure, by accepting ever-lower yields in all regulatory reviews in the last ten years.

In 2016, a study by PwC Australia on the impacts of privatization on the country's electricity market showed that, on the costs-per-customers basis, private owners of electricity distribution plants in Australia ran their assets at range of 15% -33% cheaper than the publicly-run ones. Further, their research also highlighted the 2014 analysis conducted by the New South Wales Treasury corporation which demonstrated that electricity bills in places where nearly all electricity networks belong to the private sector rose at a slower rate than where most networks are in the hands of the public.

#### **a. Trends in Infrastructure Investment in G7 Countries**

Currently, the world faces a growing need for governmental organizations to fund, maintain, upgrade, develop, and expand infrastructures essential to ensure sustained growth

of economic productivity and activity. Nearly \$45 trillion is required to modernize and upgrade water, transportation systems and electricity in the U.S., Western Europe, and Canada over the next one and a half decades. With governments increasingly hard-pressed to raise the capital needed to maintain and upgrade their infrastructure, most nations now recognize that the private sector can help them generate capital to meet these infrastructure requirements, allowing them to align the available limited resources toward handling some vital functions in their plans. Such trends present significant opportunities for investors to obtain and maintain high-quality assets across the globe.

Most investors view infrastructure as an attractive investment due to the fact that these assets provide portfolio diversification as well as allow the investors to have stable cash returns. In the current global markets, the demand for both core and private infrastructure appears particularly strong due to these investments striving to offer long-term access to inflation protected, stable, and economically insensitive cash flows. In addition to that, they also have the potential to gain low volatility, consistent development of cash flows, and yields that are less correlated with other classes of asset.

Based on historical data and investment expectations in the United States. Since the market environment undergoes several changes from time to time, as well as the increased allocations to infrastructures by various institutional investors, the return expectations from these investments are also subject to changes. There is a steady increase in consumption of electricity in the United States since 1974. The usage is not dependent on the price of electricity or economic environment. The projected price elasticity for residential



consumption of electricity is  $-0.05$  (meaning that a 20% rise in price results to a 1% fall in consumption). there is also an increasing demand and consumption of natural gas is dependent on temperature changes; and not on the economy or the prices of the underlying commodities. The correlation coefficient between the monthly consumption of residential natural gas and heating degree days (HDD), which represents the proxy for cold weather, in the United States is 0.86, showing direct proportionality between these two parameters.

Although there is little to no direct assessment of the impact of investment on infrastructure as a sector of the UK Government, one can review specific sectors where private investors tend to develop their ventures. Greiner et al., 2016 studied the role and effects of specialist investors in infrastructure within the UK, PwC analyzed the performance of the country's energy distributors, sewerage and water companies, and airports, especially those that have experienced a pronounced change in ownership in the ten years ending in 2015. The highlights of the PwC analysis showed,

A 13% decline in annual water leakage, which is equivalent to the total water consumption in Wales. In addition, the study showed a 29% decline in interruptions of electricity supply and a 39% drop in the length of average outage. a rise in the investment levels in every year from 2004 to 2014, water companies and operators of electricity distribution networks made more per-customer investments than those generated in profits.

In their review, PwC UK found that these improvements were attributed to several factors brought by the shifts in ownership. They included Readiness to work in partnerships with regulators to ensure long-term benefits for consumers. Establishing long-term perspectives on

the assets through performance evaluation and value creation, focus on the existing infrastructure, rather than the ancillary commercial ventures and aligning management incentives with the long-term performance activities.

Following its analysis, PwC concluded that the UK registered a notable rise in performance across all classes of major assets, which should be considered a “big” step due to the specialist investors’ focus and investment capital provision. An example of the PwC’s argument is the fact that an analysis of *Thames Water’s* performance after being acquired by Macquarie shows a 31% decline in leakages since 2006, beating the yearly targets set by regulators. Under the previous ownership, *Thames Water* had failed to meet all the targets set by the regulators. Another example includes the Affinity Water Company, which registered significant improvements in both cost efficiencies and customer engagement since the 2012 acquisition by Morgan Stanley and Prudential’s sector of infrastructure development

Preqin’s Infrastructure Online is one of Canada’s top analysts of the overall infrastructure investment in the country. The service has detailed profiles of more than 2,400 organizational infrastructure investors across the globe, 140 of which are based in Canada. According to a report by the Preqin Limited (2015), pension funds from both the private and public sectors, constitute half of the Canada-based infrastructure investors, indicating their prominence in the country. Insurance companies, asset managers, and endowment plans are also numerous; with each accounting for about 8% of infrastructure investment based in Canada. A third of assets under management are owned by these investors, and worth between \$0.8 billion and \$3.91 billion.

## **b. Trends in Infrastructure Investment in BRICS Countries**

According to Garcia-Escribano et al. (2015), the infrastructure gap in Brazil is a reflection of the extended period during which the country experienced low performance in infrastructure investment. In Brazil, infrastructure investment has faced a significant decline from about 5.2% of GDP to 2.25 % of GDP in the first half 1980s and over the past twenty years, respectively. It only registered a slight increase in 2013 when it reached to around 2.5% of GDP. Despite the lack of standardized or highly reliable infrastructure investment information - particularly one that allows cross-country comparison – several studies show that Brazil’s infrastructure investment, for more than one decade, has been dropping. For example, it has declined below the levels registered by fellow Latin America nations and other emerging market economies such as China, India, and Chile. In addition to that, Brazil shows significant differences in the infrastructure investment levels across different sectors. For example, the telecommunication and electricity industries are the top bearers of the vast majority of infrastructure investments in Brazil. On the contrary, Chile has directed most of its investments towards road/transport networks and supply/distribution of water and sanitation.

### **Methodology and data:**

This study uses a panel data in which countries and years are the units of observation. The data for this research have been drawn from UNCTAD, the World Bank, International Financial Statistics, and the IMF. All the variables are defined in percentage change. The data set covers the period from 1985 to 2015. In order to measure the impact of all these factors mentioned above. The panel model allows us to control for the country-specific effects arising from factors that cannot be directly measured. Therefore, we estimate the models by using generalized least squares that adjusts for heteroscedasticity across countries. Thus, the general specifications structural equation model used in this study are:

$$\text{GDPpcg} = f(\text{FDI, TRD, GCF, GOV, INF, POP}) \quad (1)$$

Where:

GDPpcg = GDP per capita growth (annual %)

FDI = Foreign Direct Investment (% of GDP)

TRADE = Trade openness as (% of GDP)

GCF = Gross capital formation (% of GDP)

GOV = General government final consumption expenditure (% of GDP)

INF = Inflation, consumer prices (annual %)

POP = Population growth (annual %)

### **Model specification:**

The most generally used approach estimates the relationship between growth rate and its determinants as mentioned in equation (1) is the static panel data models. In this study, we going to use panel data technique. Knowing that there are essentially three types of panel data models: a pooled Ordinary Least Square (OLS) regression, panel model with random effects and panel model with fixed effects. Using a pooled OLS regression, countries unobservable individual effects are not controlled so it can influence measurements of the estimated parameters. The major problem with this model is that it does not distinguish between the various countries that I have. In other words, by combining multiple countries through pooling, I ignore the heterogeneity or individuality that may exist among the countries. The first pooled model that I am going to estimate is:

$$GDP_{pcgt} = \alpha + \beta_1(FDI_t) + \beta_2(TRD_t) + \beta_3(GCF_t) + \beta_4(GOV_t) + \beta_5(INF_t) + \beta_6(POP_t) + \epsilon_t \quad (2)$$

Then we will estimate the following model with random effects and panel model with fixed effects. Thus, by combining countries' unobservable individual effects, I can express the linear model as following:

$$GDP_{pcgit} = \alpha + \beta_1(FDI_{it}) + \beta_2(TRD_{it}) + \beta_3(GCF_{it}) + \beta_4(GOV_{it}) + \beta_5(INF_{it}) + \beta_6(POP_{it}) + V_{it} \quad (3)$$

Where:

$\alpha$  = a constant term.

$V_{it} = \mu_{it} + \epsilon_{it}$  with  $\mu_{it}$  being countries' unobservable individual effects. The difference between a pooled regression and a model considering unobservable individual effects lies on exactly in it. Where  $i$  denotes country,  $t$  denotes time and remainder it is the error term. To decide between whether using fixed effect or random effect we use the Hausman test. This

test the null hypothesis of non-existence of correlation between unobservable individual effects and the growth determinants, against the alternative hypothesis of existence of correlation. If the null hypothesis is rejected, we can conclude that correlation is relevant and therefore a panel model of fixed effects is the most correct way of carrying out the analysis of the relationship between growth and its determinants. On the other hand, if the null hypothesis is not rejected we can conclude that correlation is not relevant and therefore a panel model of random effects being the most appropriate way to carrying out analysis of the relationship between growth and its determinants. On the other hand, if the null hypothesis is not rejected we can conclude that correlation is not relevant and therefore a panel model of random effects being the most appropriate way to carrying out analysis of the relationship between growth and its determinants.

**Data Description:**

GDP per capita growth (annual %): Annual percentage growth rate of GDP per capita based on constant local currency. Aggregates are based on constant 2010 U.S. dollars. GDP per capita is gross domestic product divided by midyear population. GDP at purchaser's prices 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.

Gross capital formation (% of GDP): Gross capital formation (formerly gross domestic investment) consists of outlays on additions to the fixed assets of the economy plus net

changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales, and work in progress.

Trade (% of GDP): Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.

Foreign direct investment (% of GDP): Foreign direct investment are the net inflows and the outflows 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 flows in the reporting economy from foreign investors, and is divided by GDP.

General government final consumption expenditure (% of GDP): General government final consumption expenditure (formerly general government consumption) includes all government current expenditures for purchases of goods and services (including compensation of employees). It also includes most expenditures on national defense and security, but excludes government military expenditures that are part of government capital formation.



Inflation, consumer prices (annual %): Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.

Population growth (annual %): Annual population growth rate for year t is the exponential rate of growth of midyear population from year t-1 to t, expressed as a percentage. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.

The governance indicators used as interaction terms in the estimations:

Control of Corruption: Control of Corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

Government Effectiveness: Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from

approximately -2.5 to 2.5.

**Political Stability and Absence of Violence/Terrorism:** Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5.

**Regulatory Quality:** Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.

**Correlation matrix:**

Tables (11-12) shows the correlation between the independent variables included in all the models, and does not show any serious collinearity problems.

**Panel Unit Root Tests:**

Running the Levin-Lin-Chu to check and correct for unit roots in this type of model and after taking the optimal lag length for all the variables accordingly. it seems the panels do not contain unit-roots and the panels are stationary. Tables (9-10)

## Summary Statistics:

Table 1 : Summary Statistics (BRICS countries)

Variable		Mean	Std. Dev.	Min	Max	Observations
GDP Per Capita Growth	overall		3.867	-7.848	13.636	N = 170
	between	4.211	2.975	1.625	8.826	n = 5
	within		2.793	-7.309	11.003	T = 34
Foreign Direct Investment	overall		1.688	-1.953	8.857	N = 165
	between	1.549	1.242	.095	3.177	n = 5
	within		1.266	-1.735	9.227	T = 33
Trade Openness	overall		14.559	15.635	72.865	N = 175
	Between	44.140	13.156	24.030	56.533	n = 5
	within		8.490	26.748	62.627	T = 35
Gross Capital Formation (Infrastructure)	overall		9.843	14.830	47.685	N = 175
	between	26.563	10.015	18.984	41.631	n = 5
	within		3.978	16.556	36.961	T = 35
Government Spending	overall		3.362	10.014	21.067	N = 165
	between	16.325	3.552	11.120	19.170	n = 5
	within		1.049	12.918	19.406	T = 33
Inflation	overall		10.510	-1.407	85.741	N = 165
	between	8.307	6.314	2.294	19.041	n = 5
	within		8.843	-5.664	75.007	T = 33
Population	overall		.6663	-.460	1.898	N = 175
	between	.9390	.698	-.146	1.553	n = 5
	Within		.223	.443	1.394	T = 35

Table 2 : Summary Statistics (G7 countries)

Variable		Mean	Std. Dev.	Min	Max	Observations
GDP Per Capita Growth	overall		2.011	-5.911	5.599	N = 231
	between	1.129	.4903	.2010	1.543	n = 7
	within		1.959	-5.636	5.342	T = 33
Foreign Direct Investment	overall		2.163	-9.659	7.683	N = 217
	between	-1.068	.7677	-2.157	-.2932	n = 7
	within		2.042	-8.577	7.426	T = 31
Trade Openness	overall		17.992	18.348	85.874	N = 231
	Between	49.377	17.971	25.254	69.776	n = 7
	within		6.683	26.350	67.228	T = 33
Gross Capital Formation (Infrastructure)	overall		2.764	14.733	30.865	N = 231
	between	21.326	2.273	17.582	25.156	n = 7
	within		1.781	17.461	27.035	T = 33
Government Spending	overall		2.452	13.995	24.008	N = 245
	between	19.023	2.353	15.129	23.021	n = 7
	within		1.110	16.082	21.959	T = 35

Inflation	overall		1.082	-1.352	4.484	N = 238
	between	1.660	.7642	.0930	2.350	n = 7
	within		.8170	-1.044	4.329	T = 34
Population	overall		.4468	-1.853	1.203	N = 245
	between	.4949	.3926	.0001	.9993	n = 7
	Within		.2580	-1.358	1.352	T = 35

### Empirical Results:

The purpose of our empirical analysis is to determine the effects of trade, FDI and infrastructure spending (GCF) on economic growth in developed and developing economies, and to measure how these variables interacts with governance indicators in promoting the economic growth, and to control for preexisting economic conditions by taking account for variations in macroeconomic policies and institutions in the host countries, we include variables, such as government spending, inflation rate and population growth as ones of the explanatory variables for growth. We investigate the effects of trade, FDI and GCF on economic growth in a structure of cross-country equations utilizing data from 7 developing (G7) and 5 developing (BRICS) countries over the last three decades 1985-2015. The system for each economy has five equations, where the dependent variable in all equations is the per-capita GDP growth rates, and the difference between each is that, the first is for the baseline and the rest is regressed with one of the governance indicators, which we test them individually to capture their effect on the development output.

Table 3: Growth Model Estimation - BRICS (Baseline)

Dependent variable: GDP per capita growth

Independent variable	Reg(1)	Reg(2)	Reg(3)	Reg(4)	Reg(5)
FDI	.2956			.0469	.0933

	(.2399)			(.1891)	(.1914)
TRD		.0546**		.0308	.0110
		(.0272)		(.0218)	(.0227)
GCF			.2695***	.2595***	.2099***
			.0291	(.0311)	(.0576)
GOV					-.2013
					(1564)
INF					.0282
					(.0343)
POP					-1.485***
					(.5583)
Constant	3.833***	1.769	-2.985***	-4.010***	2.407
	(.5482)	(1.279)	(.8307)	(1.226)	(4.146)

\*\*\*, \*\* and \*denote significance at 1%, 5% and 10 % level of significance respectively.

Figure in parenthesis below the coefficient estimates are standard error

Table 4 : Growth Model Estimation – G7 (Baseline)

Dependent variable: GDP per capita growth					
Independent variable	Reg(1)	Reg(2)	Reg(3)	Reg(4)	Reg(5)
FDI	-.0773 (.0917)			-.0803 (.0903)	-.0223 (.0775)
TRD		.0098 (.0100)		.0224* (.0115)	.1124*** (.0298)
GCF			.0980 (.0647)	.1759** (.0804)	.4959*** (.1146)
GOV					-.2602*** (.1789)
INF					.2873*** (.1938)
POP					.7210 (.6379)
Constant	.9502*** (.2206)	.6407 (.5253)	-.9619 (1.392)	-3.922* (2.007)	2.027 (4.5348)

\*\*\*, \*\* and \*denote significance at 1%, 5% and 10 % level of significance respectively.

Figure in parenthesis below the coefficient estimates are standard error

The Regressions presents the econometric results and analyzes alternative specifications for each economy. Tables (3) and (4) illustrate the growth estimations for the baseline regressions for our basic specification with explanatory variables of FDI, trade, GCF,

GOV, inflation rate and population growth. The Hausman test is applied to determine which model is stronger: fixed effects model and random effects model. The null hypothesis specifies that the random effect is not correlated with exogenous variables. The logical initiative supports the results of Hausman test, the random is suitable for the BRICS countries and the fixed effects model being more suitable than the random effects model for the G7. Which indicates that most coefficients have the predicted signs, particularly the nature and conditions of these economies which clarify some of the signs change for some coefficients across specifications. Growth estimation in Table (3) reveals that for the BRICS countries, Regressing FDI, Trade and GCF against GDP per capita growth individually yield a positive impact on economic growth but only Trade and GCF are statistically significant. Which may indicate that in order to accelerate the growth of per capita growth, an increase in high volume of trade movement and accelerated infrastructure expanding is needed. specially in the latter, which may explain the results in regression 4 and 5, In regression 4, which is when we regress the three main variables together against GDP per capita which yields a positive coefficient for FDI, Trade and GCF which is the only one that is highly statistically significant.

Finally, in regression 5, we regress the three main variables together with all the control variables, government spending, inflation and population growth in a random effect model, based on the Hausman result. which yields positive coefficients for all of them and highly statistically significant for gross capital formation with the exception for the government spending and population growth which they yield a negative and its highly statistically significant for population growth, and that may indicate an inconsequential

slowdown in the flow in of foreign investments and the globe trade and countries in the BRICS specifically China is might reaching the peak of export capacity and in order to increase their growth they need to focus on infrastructure expanding in their own countries mostly through private enterprises to increase by proxy per capita income and as consequence private spending which will alleviate some of the pressure on government spending and push the GDP per capita growth to the level of keeping up with the growth of the population and the increased inflation rate.

For the G7 countries growth estimation in Table (4) shows almost similar results to the BRICS countries with the exception for FDI which they yield a negative coefficient. In regressions 2 and 3 for trade and GCF separately they yield positive coefficients against GDP per capita growth. In regression 4, they yield the same result as they were separate, with exception of Trade and GCF which is now a statistically significant. In regression 5, FDI and government spending are negative and the latter is highly statistically significant. The rest yield positive coefficients but its highly statistically significant for Trade, GCF, inflation. This may show that almost half of the money injected in the market by central banks as fiscal policy in the G7 countries are stimulate economic growth through infrastructure spending exclusively, but is not through tax cuts and other government handouts. And also, may show that the unconventional monetary policy named (Quantitative Easing), which the federal reserve bank and the European central bank adopted to restore the functioning of financial markets may helped jump start the economy initially after the great recession of 2008, but it may exceed its limit and target.



Which, also may indicate, why there are some deflation and slowdown in trade flow movement which may result these economies to slowdown or stagnate.

The BRICS countries are outperforming the G7 countries by more than a third when it comes to attracting the inflow of FDI and trade, according to the IMF, the total FDI inflows accounted for 2.3% of the total BRICS countries' GDP in 2015 compares to G7's 1.7% of GDP and 2.2% of the world's total GDP. Nations is promoting FDI and Trade openness because it accelerates economic expansion. As well as increasing the job and business creation, infrastructure building and tax revenues, it can also serve as a power instrument to global competitiveness and productivity through transmission of knowledge, investment, services, manufacturing technologies and the know-how to infrastructure expanding. For instance, Brazil had an inflow of FDI equivalent to 3.9% of its GDP in 2014 and China 2.6%. They also maintain the highest volumes of foreign investments in absolute terms, Brazil with (75billion USD) and China with (250billion USD in total) second only to the USA (379billion USD in total). However, Russia attracted only 0.4% of foreign investments as a share of its economy (6.5billion USD in total), due to the sanctions that continue to negatively impact the economy and discourage potential foreign investments.

According to WTO reports, the growth of international trade declined substantially from a growth rate of 8% in 2007 to only 3.1% in 2014. Such a decline in import-demand lead to a slowdown in global trade which has negatively impacted the export oriented BRICS and G7 countries and their economic goals. the inflow of foreign investments is a sign of

confidence in an economy, generating a boost to economic growth, jobs and business creation and also, expansions in fields such as infrastructure building and innovation technologies. Countries such as China in particular have for some while now been highly concentrated on fostering a climate that promotes trade volumes and foreign investment and although they maintain a steady economic growth over the past two decades, and even though they are experiencing some slowdown, China's economy, which dominates the BRICS, is now, overshadow the rest of the group combined, and with a steady and continuous growth, and with enough time, it could grow twice as big. the IMF forecast for the BRICS economic growth is highly positive, with a stable internal market structure, the growth of which will be significantly strengthened by substantial levels of infrastructure expanding, trade and FDI. Many economists like Jim O'Neill, the former commercial secretary in the U.K. Treasury, predict that the BRIC economic performance with exception of South Africa will surpass the G7 if they keep maintaining their growth. The G7 economies may benefit from re-establishing themselves as a more resilient trade partners and their economies as more attractive locations for FDI. To achieve this is to restructure their tax systems to be more favorable, by decreasing the tax rates on foreign corporations and offering incentives for them to establish or expand operations there.

Table 5 : Growth Model Estimation - BRICS (FDI with Governance Indicators)  
Control of Corruption - Government Effectiveness - Political Stability - Regulatory Quality  
Dependent variable: GDP per capita growth

Independent variable	Reg(1)	Reg(2)	Reg(3)	Reg(4)
FDI	.0252 (.1938)	.0987 (.2083)	.0942 (.2035)	.0889 (.2027)
TRD	.0132 (.0225)	.0280 (.0259)	.0132 (.0243)	.0128 (.0243)
GCF	.1757***	.2029***	.2175***	.2028***

	(.0606)	(.0614)	(.0673)	(.0629)
GOV	-.2027 (.1547)	-.1232 (.1792)	-.2093 (.1728)	-.1981 (.1753)
INF	.0276 (.0339)	.0283 (.0382)	.0384 (.0390)	.0378 (.0389)
POP	-1.341** (.5593)	-1.700*** (.6351)	-1.477** (.5914)	-1.437** (.6188)
FDI*CC	.6796* (.4093)			
FDI*GE		-.0969 (.4082)		
FDI*PS			.2200 (.5422)	
FDI*RQ				-.1411 (.4482)
Constant	3.035 (4.121)	.8171 (4.704)	2.271 (4.557)	2.364 (4.545)

\*\*\*, \*\* and \* denote significance at 1%, 5% and 10% level of significance respectively.  
Figure in parenthesis below the coefficient estimates are standard error

Table 6 : Growth Model Estimation – G7 (FDI with Governance Indicators)  
Control of Corruption - Government Effectiveness - Political Stability - Regulatory Quality

Dependent variable: GDP per capita growth				
Independent variable	Reg(1)	Reg(2)	Reg(3)	Reg(4)
FDI	-.1168** (.3506)	-.1437** (.4898)	-.1420** (.2176)	-.1358** (.3296)
TRD	.1065*** (.0291)	.1112*** (.0294)	.1102*** (.0295)	.1105*** (.0301)
GCF	.4170*** (.1164)	.4638*** (.1148)	.4574*** (.1154)	.4869*** (.1165)
GOV	-.9139*** (.1766)	-.9307*** (.1791)	-.9836*** (.1770)	-.9691*** (.1810)
INF	.2700*** (.1908)	.2205*** (.1918)	.2094*** (.1917)	.2228*** (.1970)
POP	.7724 (.6227)	.6348 (.6328)	.8109 (.6329)	.7646 (.6464)
FDI*CC	-.4599** (.1876)			
FDI*GE		-.4912* (.2744)		
FDI*PS			-.4251* (.2376)	
FDI*RQ				-.1055

				(.2138)
Constant	2.7065 (4.433)	1.931 (4.485)	3.015 (4.519)	2.065 (4.552)

\*\*\*, \*\* and \*denote significance at 1%, 5% and 10 % level of significance respectively.  
Figure in parenthesis below the coefficient estimates are standard error

Table 7 : Growth Model Estimation - BRICS (TRADE with Governance Indicators)  
Control of Corruption - Government Effectiveness - Political Stability - Regulatory Quality

Dependent variable: GDP per capita growth				
Independent variable	Reg(1)	Reg(2)	Reg(3)	Reg(4)
FDI	.0496 (.1902)	.0732 (.2045)	.0506 (.1936)	.0297 (.1882)
TRD	.0096 (.0224)	.0052 (.0300)	.0305 (.0233)	.0237 (.0249)
GCF	.2117*** (.0568)	.1991*** (.0640)	.1668*** (.0582)	.2376*** (.0560)
GOV	-.2923* (.1621)	-.2487 (.1972)	-.4991*** (.1909)	-.3823** (.1623)
INF	.0338 (.0339)	.0384 (.0390)	.0381 (.0334)	.0415 (.0332)
POP	-2.566*** (.8083)	-1.857* (1.019)	-2.515*** (.6737)	-2.889*** (.7217)
TRD*CC	.0382* (.0209)			
TRD*GE		.0130 (.0302)		
TRD*PS			.0523** (.0204)	
TRD*RQ				.0761*** (.0262)
Constant	5.514 (4.4299)	4.027 (5.775)	10.065** (5.007)	7.789* (4.386)

\*\*\*, \*\* and \*denote significance at 1%, 5% and 10 % level of significance respectively.  
Figure in parenthesis below the coefficient estimates are standard error

Table 8 : Growth Model Estimation – G7 (TRADE with Governance Indicators)  
Control of Corruption - Government Effectiveness - Political Stability - Regulatory Quality

Dependent variable: GDP per capita growth				
Independent variable	Reg(1)	Reg(2)	Reg(3)	Reg(4)
FDI	-.0212 (.0723)	-.0214 (.0764)	-.0193 (.0785)	-.0139 (.0768)

TRD	.0192 (.0364)	.0575 (.0346)	.1113 (.0301)	.1612 (.0401)
GCF	.4593*** (.1074)	.5953*** (.1161)	.4966*** (.1152)	.4986*** (.1134)
GOV	-.7665*** (.1756)	-.7534*** (.1904)	-.9710*** (.1824)	-.9786*** (.1769)
INF	.2415*** (.1817)	.2345** (.2104)	.2125*** (.1954)	.2460*** (.2078)
POP	1.075* (.6023)	.8236 (.6173)	.7572 (.6524)	.5460 (.6384)
TRD*CC	.0636*** (.0161)			
TRD*GE		.0594*** (.0209)		
TRD*PS			.0046 (.0158)	
TRD*RQ				-.0431* (.0240)
Constant	-1.606 (.4.332)	-5.794 (5.174)	1.690 (4.696)	2.401 (4.489)

\*\*\*, \*\* and \* denote significance at 1%, 5% and 10% level of significance respectively.

Figure in parenthesis below the coefficient estimates are standard error

Table 9 : Growth Model Estimation - BRICS (GCF "Infrastructure" with Governance Indicators)  
Control of Corruption - Government Effectiveness - Political Stability - Regulatory Quality

Dependent variable: GDP per capita growth

Independent variable	Reg(1)	Reg(2)	Reg(3)	Reg(4)
FDI	.0542 (.1927)	.0795 (.1934)	.1209 (.1938)	.0430 (.1885)
TRD	.0075 (.0228)	.0019 (.0273)	.0211 (.0218)	.0168 (.0236)
GCF	.2406*** (.0617)	.1992*** (.0604)	.1924*** (.0549)	.2658*** (.0581)
GOV	-.2707* (.1640)	-.2494 (.1758)	-.6734*** (.2102)	-.4571*** (.1724)
INF	.0278 (.0341)	.0284 (.0344)	.0246 (.0326)	.0296 (.0328)
POP	-2.204*** (.7710)	-1.873** (.8490)	-2.156*** (.5707)	-2.712*** (.6740)
GCF*CC	.0688 (.0512)			
GCF*GE		.0406		

		(.0668)		
GCF*PS			.1195***	
			(.0376)	
GCF*RQ				.1900***
				(.0638)
Constant	4.273	4.283	13.074**	8.347**
	(4.354)	(5.182)	(5.177)	(4.437)

\*\*\*, \*\* and \*denote significance at 1%, 5% and 10 % level of significance respectively.  
Figure in parenthesis below the coefficient estimates are standard error

Table 10 : Growth Model Estimation – G7 (GCF “Infrastructure” with Governance Indicators)  
Control of Corruption - Government Effectiveness - Political Stability - Regulatory Quality  
Dependent variable: GDP per capita growth

Independent variable	Reg(1)	Reg(2)	Reg(3)	Reg(4)
FDI	-.0078 (.0754) .1299***	-.0132 (.0767) .1322***	-.0245 (.0775) .1185***	-.0224 (.0778) .1138***
TRD	(.0296)	(.0300)	(.0304)	(.0302)
GCF	.4440*** (.1130)	.4895*** (.1116)	.4833*** (.1153)	.4855*** (.1193)
GOV	-.8700*** (.1787) .2734***	-.8231*** (.1845) .2360***	-.9204*** (.1886) .2078***	-.9769*** (.1800) .2018***
INF	(.1886)	(.1906)	(.1938)	(.1954)
POP	1.002 (.6286)	.7273 (.6207)	.7430 (.6383)	.7351 (.6422)
GCF*CC	.0957* (.0362)			
GCF*GE		.1127** (.0439)		
GCF*PS			.0395 (.0394)	
GCF*RQ				.0141 (.0427)
Constant	-2.868 (.4.777)	-5.204 (5.237)	.2329 (4.875)	1.714 (4.652)

\*\*\*, \*\* and \*denote significance at 1%, 5% and 10 % level of significance respectively.  
Figure in parenthesis below the coefficient estimates are standard error

Including interaction terms not only improves the overall performance of the estimation but also allows us to use them as proxies to capture their effects individually on economic growth. regressions 1,2,3 and 4 for the main and control variables in all the above tables yields almost identical results to the baseline results, so, we are going to focus on the interaction terms results. The growth estimation for the FDI, Trade and GCF and their interaction with governance indicators, which is consist of control of corruption, government effectiveness, political stability and regulatory quality show that when it comes to control of corruption, the G7 countries are maintaining their track record of actively fighting corruption in a bid to foster economic growth. In the year 2016, in line with the mandate to alleviate corruption, all the G7 countries espoused an anti-corruption plan, which postulated impeccably significant cooperation on imposing enormous penalties and fines on major financial institutions and what is called “too big to fail” which been found guilty of fraud or market manipulation. The G7 countries are in full thrust, understanding of the fact that the vision 2030 sustainable development goal is only plausible without corruption and hence the fast movement in the economic growth and development of these countries. The BRICS countries, on the other hand, are intensely struggling with corruption and therefore the dwindling economic growth. For instance, the corruption scandal in Brazil is associated with the high government officials, and hence national initiatives are prevented from the top level resulting in poor economic growth (Staff, 2017, July 29). And, in order to increase the per capita GDP growth, the general public should have the chance to share some the investments opportunities that flown into BRICS nations as foreign investments, which in consequent lead to widen the middle-class share of income and increase in the small business companies that can push

trade flows in and outside their countries and expand the infrastructure building through private-owned enterprises.

For FDI, Trade, GCF and its interaction with government effectiveness which capture the level of the quality of public and the civil services and how they are independence from the political pressures and how the policy are been created and implemented and to how much degree, the policy makers are commitment to such policies when it comes to the free movement of trade, foreign investments flow and infrastructure spending, which shows that with trade and infrastructure expanding need to be increased to effect growth positively and only FDI is one been impacted negatively from an excessive government intervening and poor policies implementation. The government forms the ultimate policy enforcer and hence significantly determines the level of economic growth a country embraces. In the G7 countries, there is consistency in the inter-governmental relations towards ensuring the implementation of policies that enhance trade quality and domestic economic growth. In fact, in Germany, the government effectiveness index ranked at 94.23 percent. As such, the G7 cumulatively experience exponential growth. The BRICS countries, for instance, Brazil, the government effectiveness index has been decreasing over the years to a low of 47.6 percentile rank and hence explains the substantive disparity between the G7 and the BRICS (Bank, 2016).

In that affect, this we lead us to our main variables and their interaction with the regulatory quality indicator, which depict the public views of the ability of the official institutions and their ability to formulate and implement



comprehensive policies and regulations that empower and stimulate private sector expansion. These regulations determine the flexibility of businesses and the capability of the state to devise and implement sound policies and regulations that enhance and stimulate private sector development. According to the regulatory quality index, all the G7 countries rank positively with Germany at the helm of the G7 nations at 1.82 and the UK, Canada, USA, and Japan following closely at 1.78, 1.76, 1.50 and 1.44 respectively. The BRIC countries rank lowly with South Africa at 0.21 and the rest well below zero. As such, private sector development in the G7 nations is somewhat well regulated as compared to BRICS and hence the difference in economic growth (Bank, 2016).

Finally, Analyzing FDI, Trade and GCF in these nations and their interaction with political stability indicator, and how is political stability by proxy effect economic growth, evidently, business activity and trade can only thrive and succeed amidst a stable political climate. Notably, according to the World Bank measures of global stability index, all the countries in the G7 lie in the positive space with Canada at the helm with 1.24 ranking tenth globally. As such, the G7 nations hence enjoy political stability as well as the absence of violence or terrorism, and ultimately, the perceptions of the likelihood of political instability and or politically-motivated violence, including terrorism are low hence consequential economic growth and development. In contrast, all the BRICS countries rank below zero with Russia tailing at -1.01. Given this index ranking, these countries' political environment is a threat to business survival and trade and hence the laxity in economic growth (Bank, 2016).

## **Conclusion**

We have carried out a detailed research on the G7 and the BRICS economies. The cross-examination of these economies has revealed a number of things about trade, foreign direct investments as well infrastructural developments and their effects on the developed economies (G7 countries) and the developing economies (BRICS countries). While it's apparent that both economies heavily rely on these economic attributes to spur growth in different economic pillars, their deployment in the period under consideration as seen in the literature is quite different.

Developing economies still lag behind in economic development due to decades of economic stagnation, poor living standards and sometimes environmental disasters which have left infrastructural development underutilized. For instance, the investment in infrastructure as a proportion of GDP is about 10% in developing economies in comparison to 16% in developed countries. While the BRICS economies, especially in the Asian continent, are rapidly catching up with the developed nations, the rest of the developing economies, especially in the African continent, need to adopt sustainable economic policies to spur and sustain growth.

The world faces a growing need for governmental organizations to fund, maintain, develop, and expand infrastructures essential to ensuring sustained growth of economic productivity and activity. Developing economies need to save annually by eliminating all inefficiencies and also carry 100% capital budget execution. The relationship between infrastructure and economic growth is two-way: infrastructure creates growth in the economy and on the other hand, economic growth brings infrastructural changes. Transport infrastructure brings social and economic rewards and benefits to both the developing and

developed economies. Benefits enjoyed including: improving market productivity and accessibility ensuring balanced economic development across different regions, creating employment and promoting labor mobility.

Significant growth rates are associated with countries embracing ongoing globalization and the increasing openness to international trade. Trade openness and economic policies in some cases may have played a huge role in increasing the gap between the developing and developed economies. Trade policies play a crucial role in facilitating economic growth. Trade may affect the household incomes through specialization arising from realizing comparative advantage, realization from returns of economies of scales, technological spillovers from investments, improved communication channels, exposure to new services and goods, new production methods and new ways of organization behavior.

Numerous studies in the report have shown that there is a long run relationship between trade and economic growth. In addition, these research work have shown that trade and economic growth are co-related, but their relationship is fortified by the stability in macroeconomic policies. The international community and donors recommend trade liberalization policies to developing economies in a bid of opening them and integrating them into the global market. The policies are driven by the failure of the import substitution strategy and also by findings from empirical studies that depict a more outward and progressive economies record high economic growth rates. The quality of economic growth is brought up by the proportions of exports and the quality of output. Economists argue that trade liberalization encourages countries to specialize in sectors they possess high economies of scale thus promoting productivity and efficiency in the long run. Granted, the developing economies ought to concentrate on increasing their market and trade liberation as well as the

enactment of sustainable macroeconomic policies to ensure sustainable development in different pillars of their economies.

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**Appendix:**

Table 11: Levin-Lin-Chu unit-root test

Levin-Lin-Chu unit-root test		
Variable Name	No. of lags	
	BRICS	G7
GDP per capita growth	1	2
FDI	2	4
Trade	0	2
GCF	0	2
GOV	2	0
Inflation	2	1
Population	0	0
FDI*CC	1	4
FDI*GE	5	4
FDI*PS	3	4
FDI*RQ	3	4
TRADE*CC	0	2
TRADE*GE	3	1
TRADE*PS	0	3
TRADE*RQ	0	1
GCF*CC	0	0

GCF*GE	2	2
GCF*PS	2	3
GCF*RQ	0	2

Table 12: Levin-Lin-Chu unit-root test

Levin-Lin-Chu unit-root test				
Variable Name	BRICS		G7	
	Statistic	p-value	Statistic	p-value
GDP per capita growth	-0.7227	0.2349	-0.2012	0.1916
FDI	-0.4260	0.3722	2.3299	0.9901
Trade	-0.5052	0.4581	1.0192	0.5077
GCF	-0.5014	0.4795	-0.9046	0.1828
GOV	1.5402	0.5216	0.2035	0.5806
Inflation	0.6020	0.5581	-0.8774	0.1901
Population	-0.2044	0.1190	-1.2061	0.1343
FDI*CC	-0.4244	0.3356	2.0508	0.9799
FDI*GE	3.9218	1.0000	2.9888	0.9986
FDI*PS	-0.3755	0.3536	-0.3912	0.3478
FDI*RQ	0.8627	0.8058	2.7184	0.9967
TRADE*CC	0.6369	0.5379	-1.5033	0.1461

TRADE*GE	0.6335	0.4368	-0.8222	0.2055
TRADE*PS	0.6594	0.4770	-0.5161	0.4145
TRADE*RQ	-0.7690	0.2209	-1.2181	0.1116
GCF*CC	-0.5818	0.4279	-0.6692	0.2517
GCF*GE	-0.4766	0.3910	-0.8022	0.2112
GCF*PS	1.6114	0.9465	0.7099	0.5318
GCF*RQ	-0.7057	0.2402	-0.9474	0.1717
Ho: Panels contain unit roots Ha: Panels are stationary				

Table 13 : Correlation Matrix: BRICS

Variable	GDPpcg	FDI	TRD	GOV	GCF	INF	POP
GDPpcg	1.0000						
FDI	0.1302	1.0000					
TRD	0.2035	-0.2428	1.0000				
GOV	-0.4452	-0.0339	0.0221	1.0000			
GCF	0.4917	0.2629	0.1594	-0.7494	1.0000		
INF	0.0127	-0.2310	0.1859	0.0587	-0.2807	1.0000	
POP	-0.2480	0.1336	-0.4198	-0.1570	-0.0838	-0.4048	1.0000

Table 14 : Correlation Matrix: G7

Variable	GDPpcg	FDI	TRD	GOV	GCF	INF	POP
GDPpcg	1.0000						
FDI	-0.0802	1.0000					
TRD	0.0885	-0.0659	1.0000				
GOV	0.1348	0.0727	-0.3977	1.0000			
GCF	-0.1770	-0.1720	0.4933	-0.0366	1.0000		
INF	0.2392	0.0127	0.2326	-0.3508	-0.700	1.0000	
POP	0.1892	0.0683	0.0482	-0.0436	-0.0219	0.3949	1.0000