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AN ANALYSIS OF THE RELATIONSHIP BETWEEN FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: G-7 COUNTRIES

Abstract:

A dire concern for many nations has always been their patterns of economic growth and financial development throughout the years. Tentatively, a relationship between the concepts co-exists. However, the direction of causality is of great interest, particularly in relation to the country's level of development and growth. This paper studies the existence of a relationship between financial development and economic growth using a sample of G-7 countries for the period of 1996 to 2013. Making use of panel data models such as panel unit root test, Johansen-Fisher cointegration and vector error correction model/granger causality and using secondary time series data obtained from the World Bank and the International Monetary Fund (IMF) for G-7 countries (Canada, France, Germany, Great Britain, Italy, Japan and United States). Variables used include, economic growth, stock market capitalisation, total investment growth, interest rates and population growth. Findings of the study indicated that real interest rates and total investment is positively related to economic growth in G-7; while other variables such as stock market size, do play a significant role in explaining economic growth in G-7 countries. This study may assist G-7 countries to improve their economic growth structure and financial development systems over time.

Keywords:

Financial development, economic growth, panel data, developed countries, G-7

JEL Classification: A10, C01, E00

1 INTRODUCTION

For the development of many nations, the connection between financial development and economic growth is crucial. In the region of the relationship between financial development and economic growth in developed countries, few studies have been conducted, with outcomes showing a strong favourable connection between economic growth and financial development. Levine (2005) proposed that if nations have a powerful financial system, the outlook for economic growth would be greater. This may refer to financial developments having a positive impact on economic growth and may be related to the fact that, in the event of a downturn in financial development, the same result would be visible in economic growth trends.

The panel data technique with a range of information from 1996 to 2013 is used in this research. This contributes in a number of respects to the literature. It utilises more up-to-date previous and present information; it involves nations from developed countries, with a particular focus on the G-7 countries that are part of the seven most technologically advanced economies in the world. Furthermore, the research involves variables to evaluate whether an improvement in these policies would result in more adequate economic growth, and whether financial development affects growth when the quality of financial structures is better.

Financial development is considered to be a multidimensional notion – a possibly significant tool for long-term financial growth (Adamopoulos, 2010:79). As Levine (2005), Lucas (1988) and Robinson (1952) have indicated, financial growth comprises changes in the generation of data on prospective investments and capital allocation, and sound knowledge of how to monitor companies and exercise corporate governance, trade, diversification, risk management, use and combination of savings, and eventually facilitate the exchange of products and services. Financial development is evaluated by variables such as the size, depth, access, effectiveness and stability of an economic structure that involves markets, intermediaries, and a variety of resources, institutions and laws (World Economic Forum 2011:13). Savings and investment choices, technological innovations and later economic growth impact these financial functions. Two factors are evaluated in financial growth, namely the ratio of broad money (M2) to gross national product (GDP) and the ratio of domestic credit to private sector and GDP.

As mentioned by Mohr (1998:45), economic growth is an increase in an economy's ability to generate products and services, compared to one period of time. In nominal terms, including inflation, or in real terms, adjusted for inflation, economic growth can be evaluated. In addition, economic growth can be used to compare the economic growth of one country with another through measurements such as GDP or, more frequently, GDP per capita, as these take into account variations in population between nations (International Monetary Fund, 2007; Schumpeter, 1932:1). While many regions around the world are in dire need of financial development and economic growth, the respective strategic plans for financial development and economic growth must be in place in order for them to grow. In terms of financial development and economic growth, a current connection between the two ideas must be created. Moreover, whether or not financial development precedes economic growth or whether economic growth precedes financial development remains a debatable subject.

1.2 LITERATURE REVIEW

1.2.1 Economic growth and financial development

An economy's economic growth is seen not only as a rise in productive ability, but also as an enhancement for the individuals of that economy in the quality of life. The concept of endogenous growth suggests that financial intermediation has a beneficial impact on stable development, but public intervention in the financial system has an adverse impact on economic growth (Adamopoulos, 2010:83). Economic growth can be defined as a rise in real GDP, which is inflation-adjusted GDP. Low economic growth is a complex issue, because the growth process is supported by several variables. Several variables are driving economic growth in the financial literature. These include investment ratio (Harrod-Domar model; Pagano, 1993), human capital (Romer, 1986), development of studies and openness to trade (Lewis, 1980; Bhagwati, 2004; Rodrik, 1999), among others.

Although there is a lack of adherence to theory, there are a number of partial theories discussing the role of different variables in determining economic growth and what can eventually boost economic growth. Pagano (1993) also indicates three ways in which economic growth under the fundamental endogenous growth model could be affected by the development of the financial industry. Firstly, it may increase investment efficiency. Secondly, an effective economic industry decreases transaction costs and therefore improves the proportion of money channelled into productive investments. An effective economic industry enhances investment liquidity. Finally, the growth of the economic industry can either encourage or reduce savings.

In the theories of early growth, economic growth in a country was considered to be determined by the rate of utilisation of production, capital and labour factors and the efficiency of their use (Tridico, 2010). Consequently, a continuous increase in per capita income is ascribed to ongoing advancement in manufacturing methods. As such, many economic and social development theorists have claimed that labour and machinery investment is responsible for the long-term economic growth needed for development.

1.2.2 Modern theories of economic growth

Marx and Weber's theories seem to be in opposition to each other, both of which are based on the idea that economic growth was the result of labour and machinery investment. Modern economic growth theories were based on the same investment and saving hypothesis as sources of economic growth. In particular, one growth model by Domar (1946) formed the underlying principle of most economic growth strategies employed after the Second World War in Latin America, Africa and Asia. The Harrod-Domar model specified the level of savings and productivity of capital as the keys to economic growth. Solow (1956) strongly criticised and expanded the Harrod-Domar model, which brought some fresh manufacturing variables, including labour, technological change, and some other assumptions into the model. Theoretical developments have been followed by an increasing amount of empirical research (Smith, 1904). The growth model of Adam Smith remained the main model of classical growth, but Ricardo highlighted two significant development impacts in another classical research study (Domar, 1946).

Analysis of the economic growth process was a key characteristic of the English classical economists' job, primarily represented by Adam Smith, Thomas Malthus and David Ricardo.

Despite other people's speculations before them, they must be seen as the primary precursors of contemporary theory of development. This school's concepts achieved their greatest level of growth in Ricardo's works. These economists' interest in financial development issues was rooted in their time's tangible circumstances. Their research undertook the investigations against the background of what was to be considered a new economic system – the industrial capitalism system. Political economy was a conscious effort on their part to develop a scientific explanation of the forces leading the economic system's operation, the actual developments involved in the observed changes taking place, and the long-term trends and outcomes to which they led. Classical economists' interest in economic growth also stemmed from a philosophical concern about the opportunities of advancement, which were seen as an important condition for the development of the material foundation of culture.

1.2.3 Importance of financial development and economic growth

Economists have distinct opinions about the significance of economic growth of financial development. According to Levine (1997) and Hicks (1969), economic growth has played a major part in forming industrialisation in England by enabling capital mobilisation for enormous works. In addition, Schumpeter (1934) opposed some well-functioning banks tending to spur technological modernisation by identifying and even financing some entrepreneurs with better possibilities to effectively apply these innovative products and manufacturing processors. This could make banks one of the most efficient motors invented to stimulate economic growth. Financial growth could be described as policies, variables and institutions, as proposed by Adamopoulos (2009), leading to effective intermediation and effective financial markets.

The relationship between financial development and economic growth has become, according to Levine (1997:688), a topic of significant worldwide empirical and theoretical research. Countries generally need to enhance or boost their present economic sector's effectiveness. This enables financial industries to regulate and adjust the suitable policy reforms to boost quicker economic growth. A significant fact of economic growth, as mentioned by Djoumessi (2009:3), is that it seeks to enhance capital allocation through the distribution of resources to particular developments, which allows for greater marginal productivity. Therefore, focusing on financial institutions as intermediaries may eventually increase capital productivity, which will contribute to development by collecting data that enables them to assess alternative investment trends and encourage people to invest in risky projects (Wurgler, 2000).

Furthermore, according to Djoumessi (2009:3), it is essential for economic growth to create an appropriate strategy for the financial industry. Many organisations or financial intermediaries need to be in nearby location reach to provide services such as risk management, borrowers tracking, savings mobilisation, exercising corporate control, obtaining investment opportunities data, and facilitating the exchange of products and services. It is essential that economists and global economies uncover variables that are components of financial system development; this will lead to an enhancement in the world's knowledge of the amazing variations in long-term economic growth rates that can be observed worldwide. If the fundamental variations in economic growth of these variables can be recognised, the economic industries can provide these nations with more efficient public policy guidance and possibly enhance living standards (Levine, 2001:2).

The relationship between stock markets and development can also be affected by the connection, which is not unambiguous, between stock markets and financial intermediaries. Stock markets and banks can be seen as a replacement for corporate finance as a company declines its borrowing requirements from the banking system when it issues fresh equity. Assuming that banks and financial intermediaries are in a stronger place than stock markets to solve agency problems (Diamond 1984; Stiglitz 1985), the development of stock markets can hamper economic growth if it takes place at the cost of the development of the banking system.

On the other side, an increase in stock market capitalisation at the aggregate stage may be followed by a rise in the quantity of bank notes, if not an increase in new loans, as financial intermediaries can provide additional services to new equity issuers such as underwriting. Therefore, the growth of the stock market is likely to go hand in hand with the growth of the banking system at the aggregate level. Existing evidence points to the growth of the stock market in conjunction with other economic development aspects.

There may be a significant rise in studies into the basic determinants of functioning economic systems due to the significance of defining the determinants and measures of economic growth (Levine, 1999). Technology appears to be one of the key underlying variables of divergence. Pagano (1993) indicates that under the fundamental endogenous growth model, there are three ways in which the development of the financial industry could influence economic growth. Firstly, it may boost investment efficiency; secondly, an effective economic industry decreases transaction costs and therefore improves the proportion of money channelled into productive investments. An effective economic industry enhances investment liquidity. Finally, the growth of the economic industry can either encourage or decrease savings.

1.3 METHODOLOGY

1.3.1 Data and sample period

For the study, a sample size of seven countries consisting of G-7 was used to analyse the relationship between financial development and economic growth and to measure whether there is a link between developed economies. This study uses secondary panel data, which consists of time series of the variables of financial development and economic growth. The time series data is obtained from international financial statistics, the World Bank and the International Monetary Fund. The sample period consists of annual observations starting from 1996 until 2013, with a total of 126 observations for G-7 countries. This is a time range of 17 years and is the time before and after the 2009 financial crisis. The various changes in financial development and economic growth patterns will be noticed throughout this given period

1.3.2 Model specification

To analyse the data, this study used panel data models (such as fixed effects model, random effects model and panel unit root test). Panel data, which is also known as longitudinal or cross-sectional time series data, is a dataset in which the behaviour of entities can be observed over time (Torres-Ryna, 2003:2). Generally, the link between financial development and economic growth is analysed by the following regression that will be used.

$$RGDPit = \alpha 0 + \gamma\ FDit + \beta Xit + eit \quad (1)$$

Where: $RGDPit$ is economic growth in the real GDP per capita for county i at period t,

$FDit$ are financial development variables for country I at period t

Xit is a vector of control variables for country I at period t, and

$\alpha 0$ and eit represent the intercept and error term respectively.

The description of all the variables used in this Equation 1 is summarised in Table 1 below.

Table 1: Variables' description

Variable	Indicator or Proxy	Description	Relationship with EG
Dependent variable	Economic growth (GDP per capita)	This variable is the annual increase in the per capita GDP for each country	--
Explanatory variables for financial development	Stock market (SM)	Growth in stock market capitalisation for each country	(+)
	Interest rate (IR)	Country's real interest rate	(+) or (-)
	Exchange rate (ER)	Real exchange rate of each currency against US dollar	(+) or (-)
Control variables	Investment growth (IG)	Investment equals the amount of private investment as a share of GDP	(+)
	Population growth (POP)	This measure equals the annual rate of population growth	(+) or (-)

Source: Own adjustments

1.4 RESULTS AND DISCUSSIONS

1.4.1 Descriptive statistics for economic growth and financial development indicators

Summaries of the descriptive statistics and correlation coefficients with P-values are presented in Table 2 below, respectively. During the period of 1996 to 2013, the positive skewness for three of the five variables indicates that the observed values of the variables have a long tail to the right and for the negative skewness a tail to the left. According to the probability, only total investment (TI), population (POP), and interest rate (IR) are not normally distributed as the p-value for Jarque-Bera test is less than 0.05. The skewness (different from zero) and kurtosis (greater than 3) also show that these three variables are not normally distributed.

Furthermore, the P-values of Jarque-Bera test for economic growth (GDPPP) and stock market capitalisation (SMC) are greater than >0.05, meaning that the null hypothesis formality is accepted. This is also confirmed by the skewness that is close to zero and the kurtosis that is

close to 3. In the mean model (IPS, 2003), as indicated in Table 2, the mean accounts for the short-run coefficients, which include the speed of adjustments to the long-run equilibrium values, as well as the error modification to country-by-country, while some long-run coefficient slopes are restricted to be similar across countries. The standard deviation for G-7 countries shows a high volatile level in POP with a high of 81 percent followed by SMC, 18 percent, and IR 14 percent, as GDPPP and TI are below 10 percent, which makes these variables less volatile, including SMC and IR.

Table 2: Descriptive statistics

	GDPPP	SMC	TI	IR	POP
Mean	0.031289	0.049280	-0.001977	-0.057106	0.069751
Median	0.034163	0.056737	0.005416	-0.075048	0.004808
Maximum	0.233869	0.531458	0.139637	0.488534	9.107691
Minimum	-0.179134	-0.472107	-0.186291	-0.426764	-0.899086
Std. Dev.	0.079892	0.188705	0.052306	0.146237	0.815608
Skewness	-0.155783	0.032544	-1.031167	0.557537	10.91510
Kurtosis	3.067874	2.935451	4.846713	4.330796	121.6072
Jarque-Bera	0.533818	0.044116	40.23374	15.82563	76357.20
Probability	0.765743	0.978183	0.000000	0.000366	0.000000

Source: Own adjustment based on results from Eviews9

In order to analyse the strength and association between the variables utilised, the study makes use of the Pearson correlation analysis, where the correlation coefficient indicated by (r) measures the statistical relationship between the variables utilised. Table 1 below provides a summary of the findings of the correlation analysis.

Table 3: Correlation results

VARIABLES	GDPPP	SMC	TI	IR	POP
GDPPP	1.000000				
SMC	0.058473	1.000000			
TI	0.309883	0.424653	1.000000		
IR	0.212549	0.149971	0.190110	1.000000	
POP	-0.029510	-0.107709	0.007720	0.015133	1.000000
Note: * and ** denote the level of significance at 5% and 10%, respectively					

Source: Own adjustment based on results from Eviews9

In Table 3, the coefficients of correlation are not all significant at 1 percent, meaning that there is not a high level of association between the various variables and that can be due to the difference in the G-7 countries' economies with regard to their financial development and economic growth.

The positive signs of the correlation coefficients suggest that there is a positive relation between financial development and economic growth. However, the correlation coefficients are in line with the assumption that when POP increases, GDPPP will decrease and in the case whereby TI increases, GDPPP will also increase, as their causality moves in the same direction.

1.4.2 Panel unit root

Probabilities for the unit root test are computed using an asymptotic chi-square distribution. All other tests assume asymptotic normality. In Table 4, G-7 presents the results of the tests at the levels for LLC, IPS, ADF and PP panel root test at level indicating that all variables are I(0) in the constant of the panel root regression.

Table 4: Panel unit root test

Variables	Levin, Lin & Chu t*	Im, Pesaran and Shin W-stat	ADF - Fisher chi-square	PP - Fisher chi-square
GDPPP	-5.89925***	-4.24739***	42.2200***	34.7550***
SMC	-6.31691***	-4.92060***	48.7834***	27.9940**
TI	-8.56980***	-7.05564***	69.9176***	72.7847***
IR	-7.47393***	-7.31547***	72.0342***	72.3131***
POP	-1.02523	-2.34066***	29.7653***	23.9440**
• *** and ** indicate 1percent and 5percent significance levels respectively				

			t-Statistic	Prob.
ADF			-9.311596	0.0000
Residual variance			0.000115	
HAC variance			3.55E-05	

Source: Own adjustment based on results from Eviews9

All variables are stationary or I(0), and therefore there is no need for conducting a panel cointegration test, which will only be done if the variables have a unit root or are I(1). Consequently, this study will proceed with simple panel regressions.

1.4.3 Redundant fixed effect

Low values of the likelihood ratio mean that the observed result was less likely to occur under the null hypothesis that the fixed effects are equal to zero as compared to the alternative that effects are different from zero. High values of the statistic mean that the observed outcome was nearly as likely to occur under the null hypothesis as the alternative, and the null hypothesis cannot be rejected.

For the G-7 countries data, the fixed effect model is better than the pooled regression. It presented more positive results and with a lower cross-section F-statistic. However, the changes in variable total investment (TI) and interest rate (IR) are the only statistically significant values for

G-7. Therefore, the next step is to estimate the REM results and use the correlated random effects using the Hausman test to select between FEM and REM.

Table 5: Redundant Fixed Effects

Effects test	Statistic	d.f.	Prob.
Cross-section F	0.672121	(6,115)	0.6723
Cross-section Chi-square	4.342759	6	0.6304

Source: Own adjustment based on results from Eviews9

1.4.4 Testing for random effects

The random effects model, which is also known as the error components model, assumes that the random effects are uncorrelated with the explanatory variables – otherwise there would be an endogeneity problem, which, in turn, would make the estimators inconsistent. The Hausman test for correlated random effects tests this hypothesis.

The results indicated that there is little evidence against the null hypothesis and that there is no misspecification. Therefore, it is assumed that the null hypothesis H0, which is equal to random effect = 0 and the null hypothesis is accepted and the alternative will be rejected, which is fixed effects for G-7 countries, respectively.

Table 6: Correlated random effects – Hausman test

Correlated random effects – Hausman test			
Test cross-section random effects			
Test summary	Chi-sq. statistic	Chi-sq. d.f.	Prob.
Cross-section random	3.600557	4	0.4628

Source: Own adjustment based on results from Eviews9

1.4.5 Results of cross-section random effects

Tables 6 and 7 indicate the G-7 sample size and period for fixed effects and random effects, whereby the random effects model is preferred over the fixed effects. The p-value for the test is greater than 1 percent, indicating that the random effects model is appropriate and that the fixed effects specifications is to be preferred. Therefore, for G-7 countries, we will continue with the random effects. In addition, the cross-section test shows better results for G-7 data, whereby the null hypothesis will accept the random effects and reject the alternative fixed effects as it best suits the G-7 sample with more suitable results.

Table 7: Results of cross-section random effects

Cross-section random effects test comparisons				
Variable	Fixed	Random	Var(Diff.)	Prob.
SMC	0.018525	0.026794	0.000044	0.2122
TI	0.778007	0.726431	0.001605	0.1979
IR	0.008853	0.008458	0.000002	0.7890
POP	0.895888	-2.284952	16.887210	0.4389

Source: Own adjustment based on results from Eviews9

1.4.6 Results discussion

Based on the random effect results of which in this case were the particular types of panel data model specification that was most preferred for this sample size. Even though the intercepts vary, the cross-sectional results indicated that each cross-section entity is having different error terms for each sample size and period used in the study. Within the findings of the analysis, it highlighted the importance of financial institutes in funding productive total investments and promoting stock market capitalisation. Throughout the analysis, there was a strong indication towards total investment being a contributor to economic growth and financial development. Even though in past literature with regard to finance through the correct financial systems has to be in place for financial development to increase economic growth.

G-7 results also provided a strong correlation between economic growth and financial development through total invest and interest rates as indicators and measures of the study. The random effects model was chosen for the G-7 sample even though there was little variation between the variables' outputs; when looking at the cross-sectional results, fixed effect did result in positive outputs for the G-7 bloc, and due to the sample size and period, it was found that random effects were the most appropriate for that sample. This indication is also strongly driven due to the fluctuations within the developed countries.

1.4.7 Summary of findings

Descriptive statistics did in fact indicate that the GDP growth and the financial development indicators were growing in the same direction in an aggregate basis, which is by average all country data; however, when statistically significant tests were run, it could not be concluded that differences between countries' economic growth rates could be explained by differences in their financial development indicators. In the tests, it was found that the data for G-7 is not suited for random effects, which is because the approach is only valid when the composite error term ωit is uncorrelated with all of the explanatory variables. However, the study tried to establish a significant relationship between financial development and economic growth. It also used the measure of stock market capitalisation, and concluded that there is a significant relationship. The study emphasised that the results are an indication of only a partial correlation, and more research would be needed in the area.

1.5 CONCLUSION AND RECOMMENDATIONS

By means of the theoretical overview, the empirical analysis in this study also revealed some precision regarding the significance of financial development. The empirical results of the study indicated that, despite the fact that the countries confronted numerous barriers, which ruin the advancement of their particular economies' growth and financial development, there may be proof that certain indicators for financial development have positively affected economic growth.

GDP growth and the financial development indicators were growing in the same direction on an aggregate basis. Based on the findings of this study, the following are recommended: subsequently financial development is an imperative element for economic growth, additional support/research should be dedicated towards the precise instrument by which it impacts economic growth, and countries should be able to share that among one another for global economic growth to adhere; data should be regularly updated by countries and needs to ensure that the values published are accurate, so that future studies can be able to produce relevant results; positive relations between financial development and economic growth frameworks in countries, focus points should be whichever one a country lacks. To conclude, there is a positive relationship between financial indicators and growth, and that financial development is correlated strongly with subsequent rates of growth, stock market capitalisation, and total investment. In addition, it was found that this is a standard implication of models of endogenous growth with financial intermediation.

2 References

Adamopoulos, A., 2010. Financial development and economic growth an empirical analysis for Ireland. International Journal of Economic Sciences and Applied Research, 3(1), pp. 75-88.

Antonios, A., 2010. Financial development and economic growth a comparative study between 15 European Union member-states. International Research Journal of Finance and Economics, 35, pp. 143-149.

Baltagi, B.H., Griffin, J.M. and Xiong, W., 2000. To pool or not to pool: Homogeneous versus heterogeneous estimators applied to cigarette demand. Review of Economics and Statistics, 82(1), pp. 117-126.

Djoumessi, E.C.K., 2009. Financial development and economic growth: a comparative study between Cameroon and South Africa (Doctoral thesis).

Diamond, D.W., 1984. Financial intermediation and delegated monitoring. The review of economic studies, 51(3), pp. 393-414.

Domar, E.D., 1946. Capital expansion, rate of growth, and employment. Econometrica, Journal of the Econometric Society, pp. 137-147.

Hicks, J., 1969. A theory of economic history (Vol. 9). Oxford: Oxford University Press.

Im, K.S., Pesaran, M.H. and Shin, Y., 2003. Testing for unit roots in heterogeneous panels. Journal of econometrics, 115(1), pp. 53-74.

International Monetary Fund. 2007. International financial statistics yearbook, Washington DC: International Monetary Fund.

Statistics Department Staff, 2007. Direction of Trade Statistics Yearbook 2007. International Monetary Fund.

Levine, R., 1997. Financial Development and Economic Growth: Views and Agenda ", Journal of Economic Literature, pp. 35.

Levine, R. 1999. Law, finance and economic growth. Journal of Financial Intermediation, 8(2), pp. 36-67.

Levine, R., 2001. International financial liberalization and economic growth. Review of international Economics, 9(4), pp. 688-702.

Levine, R., 2005. Finance and growth: theory and evidence. Handbook of economic growth, 1, pp.865-934.

Lucas Jr, R.E., 1988. On the mechanics of economic development. Journal of monetary economics, 22(1), pp. 3-42.

Mohr, P. 1998. Economic indicators. 4th ed. Pretoria: Unisa Press.

Mohr, P., 2005. Economic indicators (Vol. 37). Unisa Press.

Pagano, M., 1993. Financial markets and growth: An overview. European economic review, 37(2-3), pp. 613-622.

Robinson, J., 1952. The Generalization of the General Theory, in: The Rate of Interest and Other Essays (MacMillan, London).

Rodrik, D., 2003. Institutions, integration, and geography: In search of the deep determinants of economic growth. In Search of Prosperity: Analytic Country Studies on Growth, Princeton University Press, Princeton, NJ.

Romer, P.M., 1986. Increasing returns and long-run growth. Journal of political economy, 94(5), pp. 1002-1037.

Schumpeter, J.A. 1932. The theory of economic development, Cambridge, Mass.: Harvard University Press.

Schumpeter, J.A., 2006. History of economic analysis. Routledge.

Smith, A. 1904. The wealth of nations. 5th ed. New York: Bantam Dell.

Solow, R.M., 1956. A contribution to the theory of economic growth. The quarterly journal of economics, 70(1), pp. 65-94.

Stiglitz, J.E., 1985. Credit markets and the control of capital. Journal of Money, credit and Banking, 17(2), pp. 133-152.

Torres-Ryna, O. 2003. Panel Data Analysis: Fixed & Random Effects (using strata 10.x). [PowerPoint Slides]. Princeton University.

Tridico, P., 2010. Growth, inequality and poverty in emerging and transition economies. Transition Studies Review, 16(4), pp. 979-1001.

Wurgler J. Financial markets and the allocation of capital. Journal of financial economics. 2000 Jan 1;58(1-2), pp 187-214.