



DOES FINANCIAL DEVELOPMENT CREATE ECONOMIC GROWTH? EMPIRICAL EVIDENCE FROM DEVELOPING COUNTRIES

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Abstract

The relationship between financial development and economic growth has created considerable amount of debate with little consensus among economists, particularly on the direction of causality between the two. Although several empirical studies have been carried out on different countries with different techniques, the results have been very controversial. Indeed, a major problem in several of these studies is the measurement of financial development by Credit/GDP ratio and banking assets to GDP ratio. To address this problem, this study measures financial development through adding private financial institutions assets such as hedge funds and insurance companies to public banks assets to provide a more inclusive index for financial development. The study implements Generalized Method of Moments (GMM) with annual data for the period 1990-2017 for a sample of nine developing countries. The reason for using GMM is to control for country specific characteristics and avoid biased results. The estimated results suggest that financial development when measured by this inclusive index does have a statistically significant impact on economic growth; however, corruption index plays a more important role in shaping economic growth for our sample. The study implements Granger Causality test to examine the causality direction between the two variables; the results suggest that causality only runs from financial development to economic growth when we measure financial deepening by adding private institutions assets to public banks.

Keywords: Generalized Method of Moment, financial development, sustainable economic growth, debt ratio, corruption

INTRODUCTION

Several empirical studies have investigated the relationship between financial development and economic growth; while some have found a positive effect from the first variable to the second [King and Levine (1993), Demirguc-Kunt & Levine (2008), Ume, Nkwor, & Onwumere (2015)] others have found no relationship between the two [Abu-Bader, Abu-Quarn (2006), Hasan, Wachtel and Zhou (2007)]. This paper differs from previous studies because it implements different techniques and different indicators of financial development as we discuss in more detail, later. Indeed, the majority of studies have used Credit/GDP ratio and M2/GDP, while this study implements new proxies for financial development as we discuss later.

Another controversial issue among economists is the direction of causality between financial development and GDP growth. Does the causality run from financial development to sustainable growth or the other way around? The goal of this study is twofold. First, it aims to measure the effects of financial development versus macroeconomic fundamentals such as debt ratio, inflation expectations, and corruption index on GDP growth. Second, it implements Granger Causality test to see whether causality runs from financial deepening to economic growth or the other way around, or is it bi-directional.

The novel feature of this study is that contrary to previous studies that use credit ratio to GDP or M2/GDP as an index of financial deepening, it implements a new indicator, which adds public assets of financial institutions and hedge funds to banking sector assets. The results of this study have important policy implications for monetary authorities because it can help them to recognize the determinants of economic growth and to improve financial deepening in order to foster economic growth. Indeed, this study contributes to finance literature in several important ways, (i) first and foremost it considers a group of developing countries that have not been covered in the previous studies, (ii) it implements a new index for measuring financial development, (iii) finally, it uses the Generalized Method of Moments (GMM) for panel data, which is preferred to time series data because it accounts for country specific characteristics and avoid biased parameters [Baltagi (2005)].

The remainder of the paper is organized as follows: Section 2 reviews the literature on financial deepening and its relation with sustainable economic growth. Section 3 describes data, sample, and methodology. Section 4 discusses the estimated econometric results through GMM and Granger Causality tests, and finally, Section 5 provides a brief summary of the findings, and proposes some policy implications.

LITERATURE REVIEW

During the past decades, several governments and central banks have used quantitative easing to achieve higher economic growth; however, since many of these economies have approached the liquidity trap, the efficiency of non-conventional monetary policy has been questioned. Indeed, the important question here is whether the unconventional monetary policy has a desired long-term impact on economic growth. This paper aims to measure the effects of macroeconomic fundamentals and corruption, versus financial development indicators on economic growth.

Several studies that have focused on the relationship between financial development and economic growth found evidence that financial deepening leads to more liquid markets, higher investment and faster economic growth, supporting a positive relationship between financial deepening and economic growth [King and Levine (1993), Calderon (2002), Christopoulos - Tsionas (2004), Hasan, Wachtel and Zhou (2006), Demirguc-Kunt & Levine (2008), Pradhan (2010), Rachdi-Mbarek (2011), Ume, Nkwor, & Onwumere (2015), Nyasha, Sheilla, Gwenhure, Yvonne, and Odhiambo, Nicholas (2017)]; however, the causality and the issue of appropriately measuring financial depth have been ignored in several studies. The second group of studies have found no strong evidence to support long-run relationship between financial deepening and economic growth [Abu-Bader, Abu-Quarn (2006), Guptha and Rao (2018)].

For the causality between economic growth and financial deepening, studies can be categorized under three sections. First group of economists have found a bi-directional causality relationship between economic growth and financial deepening [(Chang & Wu (2012), Alrabadi & Kharabsheh (2015) when they use M2/GDP as a measure of financial deepening]. The second group have found causality runs from financial development to economic growth [Hussain, Farah, & Chakraborty, Deb Kumar (2012), Pouatwoe, Janice Tieguhong, and Piabuo Serge Mandiefe. (2017)]. And finally, the third group have found the causality runs from economic growth to financial development [Demirguc-Kunt, and Levine (2008), Alrabadi & Kharabsheh (2015) when they measure financial deepening by Credit/GDP, Okafor, Onwumere, and Chijindu (2016)]. Most recently Muyambiri, and Odhiambo (2018) have found that the relationship between the two variables seem to vary from one country to another and depends on the indicators used to measure the level of financial development as well as on the methodology used.

To address these contradictory results, this paper aims to investigate not only the causality between economic growth and financial development, but whether there is a long-run relationship between the two variables using a co-integration technique. The study also

implements Generalized Method of Moments (GMM) technique to measure the effects of economic fundamentals and corruption versus financial deepening on economic growth. The reason we implement GMM is that it is advantageous to panel data because it simply controls for country specific characteristics and avoid biased results.

Another shortcoming in the literature that has been addressed in this study is that it implements four different indicators for measuring financial deepening as proposed by Demirguc-Kunt, and Levine (2008), (i) private credits/GDP, (ii) M2/GDP, (iii) public and private banks and hedge funds assets/GDP, (iv) and finally, financial market assets/ GDP to see whether the results are affected by the choice of indicator.

RESEARCH METHODOLOGY

This Study used annual data from financial development data bank of the World Bank on financial deepening for nine developing countries including Algeria, Egypt, Ghana, Jordan, Lebanon, Morocco, Nigeria, Tunisia, and Senegal for the period 1990-2017. The reason we have chosen this period is to cover pre and post financial crisis of 2007-09, and to cover the structural and monetary reforms that have been carried out during the late 1990s and early 2000s in several of these countries. The data for macroeconomic variables are retrieved from International Monetary Fund website, World Economic Outlook (WEO) and data for the Corruption Index is retrieved from Transparency International. The list of dependent and independent variables in this study are summarized in Table 1.

Table 1. List of Dependent and Independent Variables

Name of Variable	Definition
\dot{GDP}	GDP growth
Fin	Private and public financial institutions assets to GDP
Credit/GDP	Bank credit to GDP ratio
M2/GDP	Money supply to GDP ratio
FM	Financial market assets to GDP
Debt	Debt to GDP ratio
π	CPI Inflation
$\dot{\pi}$	Inflation expectations
Corr	Corruption Index

Given the problems associated with cross-country regressions, this study implements Generalized Method of Moments (GMM) estimator developed for panel data, which has three main advantages compared to regression models. The first advantage is to combine time series and cross-sectional variation in data. The second benefit is that in the cross-section data, the

country specific characteristic is part of the error term, which leads to biased parameters. The third benefit of using panel data is that it overcomes the problem of cross country instrumental variable that doesn't account for endogeneity problem, which may lead to inappropriate interpretation on the coefficient of financial development [Baltagi (2005)]. Therefore, following Demircuc-Kunt and Levine (2008) this study implements Generalized Method of Moments (GMM) to investigate the relationship between economic growth and financial deepening.

To identify the effects of macroeconomic fundamentals versus financial deepening on economic growth the following econometric model is estimated for our sample with annual data for the period of 1990-2017. Empirical studies by Hung (2001), Venard (2013), and Thach, Dzung, and Oanh (2017) show that corruption also plays an important role in shaping economic growth through political stability channel. Therefore, we include the corruption index into our growth model in addition to macroeconomic fundamentals and financial deepening. Equation 1 represents the theoretical model for effects of financial deepening on economic growth.

$$\overset{\circ}{GDP} = a_0 + a_1 Fin + a_2 Debt + a_3 \pi + a_4 \overset{\circ}{\pi} + a_5 Corr + \varepsilon_t \quad (\text{Equation 1})$$

At margin, the effects of financial deepening, debt, inflation, and corruption index can be calculated by examining the partial derivatives of GDP growth to financial deepening, debt, inflation, inflation expectations, and corruption index.

$$\frac{\partial \overset{\circ}{GDP}}{\partial Fin} > 0$$

$$\frac{\partial \overset{\circ}{GDP}}{\partial Debt} < 0 \quad \frac{\partial \overset{\circ}{GDP}}{\partial \pi} < 0 \quad \frac{\partial \overset{\circ}{GDP}}{\partial \overset{\circ}{\pi}} < 0 \quad \frac{\partial \overset{\circ}{GDP}}{\partial Corr} < 0$$

Indeed, based on the literature we expect the financial deepening have a positive impact on GDP growth, while debt, inflation, inflation expectation and corruption index are expected to have a negative impact on growth.

RESULTS

Johanson Cointegration technique

To find out whether there is a long-run relationship between economic growth, financial deepening, debt, inflation, expected inflation, and corruption index, we use Johanson Cointegration technique. The results presented in Table 2 indicate that all variables are stationary and integrated of degree (1). In other words, there is a long-term relationship between all variables in the model.

Table 2. Johanson Co-integration results for variables in the growth model

Ho	Eigenvalue	Likelihood ratio	5% Critical value	1% Critical value
r=0	0.23	34.17**	45.15	50.17
r<1	0.31	45.14**	39.27	46.18
r<2	0.25	34.36*	31.14	35.94
r<3	0.19	40.12**	37.17	39.24
r<4	0.20	37.18**	22.56	34.18
r<5	0.18	31.15*	23.17	381.9

Note: Rejection of unit root test at five and one percent of confidence level

is indicated with * and ** respectively.

Generalized Method of Moment (GMM)

The estimated results for GMM model suggest that financial development when measured by credit/GDP ratio and M2/GDP do not have statistically significant impact on economic growth; however, when measured by adding private financial institutions and hedge funds assets to public banks and institutions (*Fin*) the coefficient becomes significant, highlighting the importance of measurement method (Table 3). Interestingly enough, all the independent variables are able to explain more than 85% of changes in economic growth across these developing countries. The estimated results suggest that the coefficient on Corruption Index (*Corr*) is negative and has the most important impact on economic growth in this group of countries, highlighting a more significant impact than financial deepening. The coefficients on inflation, inflation expectations and debt are negative and statistically significant as expected.

Table 3. The IV and estimated GMM Results for Growth

Independent Variable	IV	GMM
π^0	-0.17 (5.12)**	-0.24 (4.17)**
π	-0.12 (0.02)	-0.23 (1.17)
<i>Fin</i>	0.24 (1.54)	0.23 (1.56)
<i>Corr</i>	-0.27 (3.59)**	-0.31 (5.4)**
<i>Debt</i>	-0.23 (4.57)*	-0.26 (4.65)**
R-squared	0.84	0.86
Adjusted-R-Squared	0.82	0.83

Note: Numbers in parentheses are standard errors and ** means the coefficient is significant at 1% level; and * means the coefficient is significant at 5% level.

Granger Causality Tests

We use Granger Causality test between economic growth and four measures of financial deepening as proposed in the literature and introduced by Demirguc-Kunt, and Levine (2008). These measures are: (i) Credit/GDP, (ii) M2/GDP, (iii) Banking and private financial institution assets/GDP and (iv) financial market assets/GDP. The estimated results in Table 4 suggest that Credit/GDP doesn't cause any changes in economic growth; however GDP growth causes changes in Credit/GDP ratio. In other words, causality runs from growth to financial deepening when we use Credit/GDP ratio. When using M2/GDP as a measure of financial deepening there is no causality between the two variables. When using banks and financial institutions assets to GDP (*Fin*) as a measure of financial deepening it cause changes in economic growth, however, there is no effect from economic growth on financial deepening. Finally, when using financial market assets (*FM*) as measure of financial deepening the causality also runs from financial deepening to economic growth, and not in the opposite direction. Indeed, our results support those of Muyambiri, and Odhiambo (2018) who state the relationship between the two variables depends on the technique and measurement method.

Table 4. Granger Causality test between growth and financial deepening indices

Null Hypothesis	Statistics	Probability	Causality direction
<i>Credit/GDP</i> doesn't Granger cause growth	1.56	0.34	No causality
Growth doesn't Granger cause <i>Credit/GDP</i>	12.14	0.01	GDP → <i>Credit/GDP</i>
<i>M2/GDP</i> doesn't Granger cause growth	1.45	0.36	No causality
Growth doesn't Granger cause <i>M2/GDP</i>	1.17	0.45	No causality
<i>Fin</i> doesn't Granger cause growth	12.31	0.03	<i>Fin</i> → GDP
Growth doesn't Granger cause <i>Fin</i>	1.56	0.77	No causality
<i>FM</i> doesn't Granger cause growth	16.85	0.002	<i>FM</i> → GDP
Growth doesn't Granger cause <i>FM</i>	1.25	0.43	No causality

CONCLUSION AND POLICY IMPLICATIONS

Using GMM method and time series data for the period 1990-2017 for a group of developing countries, the estimated results suggest that financial deepening only have a significant impact on economic growth when measured by financial institutions' assets (including private banks and hedge funds). The estimated results also suggest that Corruption Index has a negative impact on economic growth and plays a more important role than financial deepening and other macroeconomic fundamentals such as debt and inflation. The results here highlight the fact that economic growth in developing countries require more transparency and rule of law to avoid corruption at the government and private level.

The Granger Causality tests between economic growth and financial deepening indicators suggest that *Credit/GDP* and *M2/GDP* do not Granger cause economic growth, while when using banks and financial institution assets (*Fin*) and financial markets assets (*FA*) causality runs from financial deepening to economic growth. Indeed, contrary to the findings of [(Chang & Wu (2012), Alrabadi & Kharabsheh (2015))] we don't find a bi-directional causality between financial deepening and economic growth. Indeed, the results here support those of Muyambiri, and Odhiambo (2018) who state the relationship between the two variables depends on the technique and measurement method.

This study can be developed in several directions; one of the directions for future research on the topic is to use different techniques such as Vector Error Correction Model (VECM) and Autoregressive distributed lags (ARDL) to capture the reaction function of economic growth to financial deepening. Another issue that may be addressed in the future research is to use fixed effects random effects model to capture for the country specific characteristics.

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