Correlation analysis between financial market development and economic growth

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Abstract

The correlation between financial market development and economic growth was and is still an intensively studied theme from the theoretical and empirical point of view. However, there is no consensus in this regard, the existing studies providing conflicting conclusions of this relationship.

Because of this fact, the main goal of this article is to theoretically and empirically discover the relationship between the financial markets and economic growth using cluster, stationarity, multiple regressions and Granger causality methods.

The database used is composed from some variables for 27 UE countries during the period 1988-2013 and the frequency of the data is annual. The first step is to cluster the countries into two categories considering their own level of financial development. The results of the stationarity analysis confirm that there is a long-term relationship between financial development and economic growth no matter the cluster.

The multiple regressions applied on every country from the developed UE countries cluster show that the banking market and the economic growth are negatively linked while the relationship is reverse for the stock exchange market. In the case of the less financial developed countries the financial system and economic growth are positively and strongly linked.

Considering the long term relationship discovered, I used the error correction model in order to correct the possible short-term disequilibrium. The Granger causality methodology leads to different conclusions depending on the analyzed cluster. The causality is bidirectional for the developed countries and unidirectional for the less developed countries.

Key words

Financial markets development, economic growth, banking market, stock exchange market,cluster, unit root tests, stationarity, multiple regressions, vector error correction model, Granger test

Introduction

I will try in this paper to discover the relationship between financial markets development and the economic growth. As a result, I will identiy if the financial markets promote economic growth or if it is hampering the economic growth process. Considering the existing differences between the countries economies, I will answer the question: the financial markets promote economic growth on the long run?

I will use a database of 27 UE countries and I will firstly identify if there is along term relationship between the financial and the real sector. Using unit root tests I will conclude that there is a long term relationship between financial development and economic growth in the both clusters cases. For the developed countries cluster, the banking market impacts negatively the economic growth, while the stock exchange market impacts it in a positive and semnificative manner. The regressions applied on the group of the less financial developed countries reveal that the financial markets and the economic growth are positively and strongly linked.

The Granger causality reveals various results depending on the analyzed cluster. As a result the causality is bi-directional for the first cluster and unidirectional for the cluster containing less developed countries.

I consider that for sure this paper brings novelty into the economic growth literature. In the first step, the database and the variables employed are unique. Secondly, as from my own knowledge, no empirical research have had classified the analyzed countries into two clusters depending on their level of financial development so I think that this study is the first of its kind. Finaly, the econometric methods employed lead to novelty, their conclusions could lead to more efficient financial policies for UE countries for promoting sustainable long term growth.

Theoretical concepts

The economic growth is one of the most studied economical subjects. The empirical studies on this theme propose to analyze the possible correlation between various macroeconomic variables and the real sector growth on the long term.

The economic crisis revealed the negative effects of a set of inappropriate macroeconomic policies for financial sectors and the disastrous consequences on the economic growth of a specific country. As from the conclusions from the Financial Development Report the national economies which experienced a financial crisis return to the initial growth path after a longer period that the national economies which experienced recession without financial crisis. However, the countries which had financial crisis, had a financial growth rate higher that those which developed under more stable financial conditions. As a result, the understanding of the financial crisis effects on the short term on the financial development gain more importance.

How to quantify the correlation between financial development and economic growth

As I mentioned before, there is no consensus regarding the correlation between financial development and economic growth. Some of the economists consider that if a country has developed financial markets then the sustainable economic growth on the long run is insured. King and Levine (1993 a, b) pointed out that the financial markets development have a positive impact on economic growth by the functions fulfilled by the financial intermediaries such as transaction costs reduction and risk diversification.

On the other hand, there are some studies that focused on the reverse correlation between financial development and economic growth for stock exchange and banking markets. One possible cause of this negative effect for the stock exchange case is related to the existing of some speculative pressure. Other potential cause could be that the stock exchange is not so well developed for the less developed countries. As a result the banking sector helps the stock exchange market by financing people and companies depending of their own performance.

Of course the negative effect can be extended also for the correlation between banking and economic growth. For example if the interest rates diminish, there will be identified a preference for the current consumption and not for a future one. As a result the savings rate will diminish under its optimum level.

For the less developed countries, the financial markets have a diminished impact on economic growth and even a negative one. This kind of relationship can be theoretically identified using McKinnon – Shaw model – the governmental restrictions applied on the banking market such as limited interest rate, minimum reserves requirements and imposed financial programs will lead to less financial development. La Porta et al. (1997) and Levine (1999) considered as mandatory for a country to implement a legal environment for protecting investor rights. The macroeconomic policies must be developed in order to ensure an optimal financial markets development. The growth of the financial transactions costs will be the effect of a lack of a set of sustainable macroeconomic policies as we can see in the less developed countries.

Related empirical studies

In this chapter I will present the related empirical studies written on this subject together with the econometrical methodologies employed and the conclusions reached.

The first studied article is from 2013 from Narayan, P.K., Narayan, S. The database used is compiled from 65 less developed countries during the period 1995-2011. The econometric methodology employed is the Generalized Method of Moments. After the analysis was finalized the authors reached a set of conclusions: the stock exchange market has a positive impact on economic growth, the banking system has a reverse impact; at regional level (besides Asia), the influence of stock exchange market in economic growth is low.

Firicescu, B. (2012) composed a database by 5 post-communist countries in the period 1989-2009 and used OLS regressions. He reached the main conclusion that on the long run the countries must consolidate their own financial system so as to deal with the global financial new architecture. Another important point emphasized was that the exports have a positive impact on GDP growth.

The third study (N'dri, Leon K., (2010)) used an interesting methodology – a specific regression named Zeller SUR. The analysis period was 1962-2002 on 6 WAEMU countries. The authors reached some conclusions: the financial development leads to economic growth more in case of developed countries than in case of developing countries.

The following article contained an entire set of econometric methodologies such as panel regressions, VAR, Granger on a database composed by 168 states during the period 1980-2007. Hassan M. K., Sanchez B. and Yu J-S reached the conclusion that a functional financial system is a necessary precondition, but not a sufficient one for ensuring sustainable economic growth for less developed countries.

Betyak O., (2012) studied five European countries during the period 1986-2010 using OLS methodology. Some important findings are the two following ones: inflation rate and trade are positively or negatively correlated with growth depending on the country and internal investments and savings rate are positively associated with the GDP growth rate for all the countries.

The next study used a huge database composed by 71 countries (developed countries and developing ones) during 1960- 2004. Bangake C. and Eggoh J.C. (2011) employed DOLS, VECM and Granger Causality on the database composed. They reached the conclusions that there is a long term relationship between economic growth and financial development and that the causality is bi-directional.

The last article studied is one from 2014 by Christopoulus D.K. and Tsionas E.G. They used an entire set of econometric analysis starting with stationarity analysis and finalizing with panel regressions and VECM. The considered period is 1970-2010 for 10 developing countries. The results emphasized that the causality financial development-economic growth is bi-directional and that the policies create for sustaining financial markets positively impact growth, but this effect is delayed.

Analysis of the correlation between financial markets and economic growth

In this study, I have used some econometric methodologies so as to identify the correlation between financial development and economic growth for all UE countries.

The database and variables used were built by taking into consideration the previous empirical studies with the same theme, but exceeding them by the originality of the work. I have considered mostly the article ''Financial development and economic growth'' of D. K. Christopoulus and E.G. Tsionas (2004) which investigates the correlation on the long run between financial development and economic growth employing unit root test, cointegration and vector error correction analysis. The database used is made by the 27 UE countries during the period 1988-2013. The data was taken from the official web page of the World Bank

The variables from the study are anual data which can be categorized in three different groups:variables for banking market development, variables for stock exchage market development and control variables.

More details regarding this variables are presented in the bellow table:

Table 1 – Employed variables

Employed variables	
Economic growth variable	Real GDP/ capita growth rate (%)
Stock Exchange market variables	Capitalization of listed companies (%GDP) Traded stocks total value (%GDP)
Banking market variables	Credit to private sector (%GDP) Credit to domestic sector (%GDP)
Control variables	Industry, value added (%GDP) Inflation – consumer prices(%)

Afterwards I have classified the countries by their financial development in two different clusters: developed countries and less developed ones.

Stationarity testing

The stationarity analysis is a mandatory precondition for any econometric model in order to reach to valid conclusions. As a result, I have conducted this analysis considering the most important tests for this case: Augmented Dickey Fuller and Phillips-Perron (PP) tests. I have reached the conclusions that all the series are described by stationarity , no matter the cluster of countries considered. In conclusion, in this case a Vector Error Correction Model is the most appropriate methodology to be used in order to correct any potential short term disequilibrium.

Multiple regressions applied for all the considered countries

I have built some multiple regressions so as to explain the dependent variable modifications determined by the modifications in the independent ones. The equation regression will be the following one:

$$Y_t = \propto X_t + \beta F_t + \varepsilon_t$$

- Y_t – Real GDP/ capita in the period *t*,
- $\propto$ and β – the estimated parameters ,
- X – control variables vector containing inflation rate and industry – value added;
- F – financial development level (containing variables for banking and stock exchage markets);
- ε – the error

The results for the first cluster – developed countries are presented in the bellow tables:

Table 2 – Correlation type: economic growth – banking market for developed countries

Country	**+/ -**	**Country**	**+/-**
Austria	-	Italia	/
Cipru	/	Luxemburg	+
Danemarca	-	Olanda	-
Finlanda	-	Portugalia	+
Franţa	+	Spania	+
Germania	-	Suedia	-
Irlanda	-	Marea Britanie	-

Table 3 - Correlation type: economic growth – stock exchange market for developed countries

Country	+/-	Country	+/-
Austria	+	Italia	+
Cipru	+	Luxemburg	+
Danemarca	-	Olanda	+
Finlanda	-	Portugalia	+
Franţa	+	Spania	+
Germania	-	Suedia	+
Irlanda	+	Marea Britanie	+

As from the above tables, the banking market has a negative impact on economic growth on the long run for the majority of the countries. However, the impact of the stock exchange market is positive and semnificative for economic growth.

If we are analyzing the second cluster (the developing countries) we will reach the following results: the banking and stock exchange markets are positively influencing the economic growth.

Causality Testing

As I have mentioned before, I have utilized a Vector Error Correction Model in order to cope with the short term possible disequilibrium. The related equation is the bellow one:

$$\Delta Y_t = \beta_1 \Delta X_t + \beta_2 (Y_{t-1} - \gamma X_{t-1} - \alpha) + Z_t + u_t$$

Where:

- $(Y_{t-1} - \gamma X_{t-1} - \alpha)$ - The term from the quotation which corrects the short term disequilibrium.
- γ – The term which depicts the long term relationship between the two categories of variables (X and Y)
- β_1 – The term which depicts the short term relationship the two categories of variables (X and Y)
- β_2 – The term which depicts the correction speed so as to reach the optimum level (equilibrium level) on the long term.
- Z – The term which contains all the exogenius variables (the control variables).

The validation test used for all the VECM is Lag Exclusion – Wald Test.

Afterwards, in order to identify the causality I have employed Granger Causality test. The obtained results are described in the following section.

Table 4. Causality Testing – Developed countries – banking market

Country	Causality Type	Country	Causality Type
Danemarca	⇦ ⇨	Olanda	⇦ ⇨
Cipru	⇦	Luxemburg	⇦
Austria	⇦ ⇨	Italia	⇦
Irlanda	⇦ ⇨	Marea Britanie	⇦ ⇨
Franta	⇦	Spania	⇦ ⇨
Germania	⇦ ⇨	Suedia	⇦
Finlanda	⇦ ⇨	Portugalia	⇦

As a result, for the majority of the developed countries for the banking market case there is a bi-directional causality and for the stock exchange market the causality is the same type.

Table 5. Causality Testing – Less developed countries – banking market

Country	Causality Type	Country	Causality Type
Cehia	⇨	Polonia	⇨
Ungaria	⇦	Slovenia	⇨
Belgia	⇨	Lituania	⇨
Estonia	⇨	România	⇦
Grecia	⇦	Slovacia	⇨
Bulgaria	⇨	Malta	⇨
Letonia	⇨		

For the less developed countries the causality is as follows:

- ✓ Unidirectional causality, economic growth influences the banking market
- ✓ Unidirectional causality, economic growth influences the stock exchange market

Conclusions

The scope of this work is to identify the impact of the financial development on economic growth. I have started by presenting the results of the previous empirical studies published on the same theme.

In the selection of the econometric methodology employed I have considered mostly the article ''Financial development and economic growth'' D. K. Christopoulus and E.G. Tsionas (2004) which analyzed the existing correlation between financial development and economic growth by using unit root test and Vector Error Correction Model.

The conclusions obtained by myself are similar which those obtained in other studies. The long term correlation between economic growth and financial development were identified also by Bangake C., Eggoh J.C. (2011) and D. K. Christopoulus, E.G. Tsionas (2004).

In order to identify the type of relationship between the real sector and the financial one, I have used multiple regressions. As a conclusion, for the developed countries cluster the banking sytem has a negative impact on economic growth and the stock exchange has a positive one. These types of correlations were also identified in the study of Narayan, P.K., Narayan, S. (2013).

For the less developed countries for both markets the correlation with the economic growth is a positive one. The correlation type is similar with the results of Hassan M. K.,Sanchez B., Yu J-S (2011), and the reverse with those of N'dri, Leon K. (2010).

In order to cope with the short term disequilibrium, I have considered the Vector Error Correction Model and the Granger Causality Testing. The conclusion was that for the majority of the developed countries the causality is bidirectional and for the less developed ones the causality is unidirectional – the economic growth leads to financial markets development.

I consider that the econometrical results express the fact that in order to sustain a long term economic growth it is mandatory to consider on a high level of importance the financial markets. The study developed can be further analyzed, by considering the financial crisis effects or the entire financial system including taxation, insurance and so on.

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