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**SVILUPPO FINANZIARIO E CRESCITA ECONOMICA:  
IL CASO DELL'ALBANIA**

**(Financial Development and Economic Growth: Time Series Evidence from Albania)**

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## **Abstract**

The main objective of this thesis is to explore the short and long run causality patterns in the finance – growth nexus and finance-growth-trade nexus before and after the global financial crisis, in the case of Albania. To this end we use quarterly data on real GDP, 13 proxy measures for financial development and the trade openness indicator for the period 1998Q1 – 2013Q2 and 1998Q1-2008Q3. Causality patterns will be explored in a VAR-VECM framework. For this purpose we will proceed as follows: (i) testing for the integration order of the variables; (ii) cointegration analysis and (iii) performing Granger causality tests in a VAR-VECM framework. In the finance-growth nexus, empirical evidence suggests for a positive long run relationship between finance and economic growth, with causality running from financial development to economic growth. The global financial crisis seems to have not affected the causality direction in the finance and growth nexus, thus supporting the finance led growth hypothesis in the long run in the case of Albania. In the finance-growth-trade openness nexus, we found evidence for a positive long run relationship the variables, with causality direction depending on the proxy used for financial development. When the pre-crisis sample is considered, we find evidence for causality running from financial development and trade openness to economic growth. The global financial crisis seems to have affected somewhat the causality direction in the finance-growth-trade nexus, which has become sensible to the proxy used for financial development. On the short run, empirical evidence suggests for a clear unidirectional relationship between finance and growth, with causality mostly running from economic growth to financial development. When we consider the pre-crisis subsample results are mixed, depending on the proxy used for financial development. The same results are confirmed when trade openness is taken into account.

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## I. INTRODUCTION

The relationship between financial development and economic growth has been broadly discussed in the economics literature and the causality direction – whether financial development causes economic growth or vice versa – is far from being a resolved issue. “*It represents not only an intellectual curiosity but a crucial policy issue as well*” Chakraborty (2007). The objective of this thesis is to explore the causality pattern in the finance-growth nexus and finance-growth-trade openness nexus in Albania before and after the global financial crisis. Although there’s an extensive literature regarding the finance and growth nexus, there’s only one study available considering the casual relationship between financial development and economic growth for Albania. Whether financial development spurs growth or vice versa is of great concern since it serves as an important guidance for policymakers especially in developing countries. However, the literature suggests for a strong disagreement of the economists about the role of finance in boosting economic growth. There are five alternatives around which the debate evolved:

- “*Banks are the best engines that ever were invented for creating economic growth Bagehot (1873)*”, Schumpeter (1912), Goldsmith (1969), Gurley and Shaw (1955) etc., suggesting that financial development is the key to economic growth through efficient capital accumulation and higher saving rates.
- “*Where enterprise leads, finance follows, Robinson (1952)*”, identifying economic growth as the main driver of financial development;
- In his work, Patrick (1966) proposed the “*stage of development hypothesis*”, identifying two important patterns of the relationship between finance and growth as *demand following* and *supply leading*, each prevailing according to the stage of development of the economy. Blum, Federmaier, Fink, and Haiss (2002) suggest the interdependence hypothesis between finance to growth (bi-directional causality): real economy and financial sector influence each other mutually. Financial markets promote economic growth, while a flourishing economy augments demand for finance satisfied by a more developed financial system.
- The relationship between finance and growth is “*badly overstressed, Lucas (1988)*”, considering finance totally irrelevant in the process of economic development (Lucas.

1988; Stern, 1989). If the Lucas – Stern hypothesis is found to be valid, finance and growth seem to be casually independent. This hypothesis has been rejected by the high number of empirical studies which have shown the existence of a relationship between finance and growth.

- Negative causal link from finance to growth (Blum et al 2002).

To this end, we will follow a time series approach to explore the dynamics of causality patterns in finance and growth nexus. In addition to the classic framework a third intermediate variable will be introduced, trade openness, to account for the openness policy followed in the country in view of the aspired membership to EU and EMU. Also, in both cases, finance – growth nexus and finance – growth – trade openness nexus we will check if the breakthrough of the financial crisis affected these relationships. Specifically, the objectives of this study are to examine whether in Albania:

1. It exists a positive relationship between financial development and economic growth; financial development, economic growth and trade openness;
2. Explore the long run causality patterns between financial development and economic growth over 1998Q1 – 2013Q2 and pre-crisis subsample 1998Q1 -2008Q3;
3. Explore the short run causality patterns between financial development and economic growth over 1998Q1 – 2013Q2 and pre-crisis subsample 1998Q1 -2008Q3;
4. Explore the long run causality patterns between financial development, economic growth and trade openness over 1998Q1 – 2013Q2 and pre-crisis subsample 1998Q1 -2008Q3;
5. Explore the short run causality patterns between financial development, economic growth and trade openness over 1998Q1 – 2013Q2 and pre-crisis subsample 1998Q1 -2008Q3;
6. Did the breakthrough of the global financial crisis change the observed causality patterns in the finance-growth nexus and finance-growth-trade nexus?

We will assess the stated hypothesis considering a sub sample from 1998Q1 to 2008Q3 and full sample from 1998Q1 to 2013Q2. Data availability was the main constraint to this study, since as in many developing countries time series on macroeconomic variables are too short and lack of accuracy.

In the finance-growth nexus, empirical evidence suggests for a positive long run relationship between finance and economic growth, clear unidirectional relationship between finance and growth, with causality running from financial development to economic growth. The global financial crisis seems to have not affected the causality direction in the finance and growth nexus, thus supporting the finance led growth hypothesis in the long run in the case of Albania.

In the finance-growth-trade openness nexus, we found evidence for a positive long run relationship the variables, with causality direction depending on the proxy used for financial development. The introduction of trade openness in the finance and growth nexus has modified somewhat the causality patterns. When the pre-crisis sample is considered, we find evidence for causality running from financial development and trade openness to economic growth. The global financial crisis seems to have affected somewhat the causality direction in the finance-growth-trade nexus, which has become sensible to the proxy used for financial development.

On the short run, sample 1998Q1 – 2013Q2 empirical evidence suggests for a clear unidirectional relationship between finance and growth, with causality mostly running from economic growth to financial development. When we consider the pre-crisis subsample results are mixed, depending on the proxy used for financial development. The global financial crisis seems to have affected the short run causality patterns in the finance and growth nexus. We observed that there is more evidence on bi-directional causality between finance and growth. The same results are confirmed when trade openness is taken into account.

*Motivation and novelties of the study:*

The importance of the causality patterns in finance – growth and finance-growth-openness nexus in the case of a developing country like, Albania comes from the fact that it might have important policy implications for the long term economic development. Albania represents an interesting case study, since in the last two decades it has undergone various economic and financial experiences trying to catch-up with the EU neighboring countries (especially Italy and Greece) and in the foreseen integration in EU. Whether finance leads economic growth or vice versa is an issue to be addressed, especially after the XXI<sup>th</sup> century financial crisis witnessed global markets. Albania was not immune to the external shock that involved global markets, although its financial backwardness delayed somewhat crisis effects spillovers in domestic

markets. To the best of our knowledge there's only one study to consider the growth and finance nexus in the case of Albania (Dushku, 2009), using data from 1996 to 2007, using a limited set of proxies for financial development. This would be the first country specific study to account for the financial crisis effects on the finance and growth nexus and to consider the effects of trade openness on finance and growth nexus. Summing up, the novelties of this thesis consist in: (i) longer time series (1998Q1 -2013Q2), (ii) a new set of 13 proxies for financial development, (iii) account for the global financial crisis effects (1998Q1 – 2008Q3), (iv) trade openness effects.

The remainder of the thesis proceeds as follows: in Section II a brief overview of the Albanian economy and financial system development will be presented. Section III comprises overall literature review on the finance-growth nexus and finance-growth-trade nexus. In section IV a description of methodological issues and stylized facts on the data will follow. Empirical results will be summarized in the V Section of this thesis. Thesis conclusions and final remarks follow.

## II. MACROECONOMIC OVERVIEW OF ALBANIA

### II.1 The Republic of Albania: facts and stages of development

Table 1. Some facts about Albania

<b>Name</b>	Republic of Albania (formerly People's Socialist Republic of Albania)
<b>Population:</b>	2.821.977 inhabitants (-8.0% compared to 2001 census) (estimated 500.000 immigrants living abroad)
<b>Total surface</b>	28,748 km <sup>2</sup> (land: 27,398 km <sup>2</sup> , water: 1,350 km <sup>2</sup> )
<b>Land boundaries:</b>	717 km border; Greece 282 km, Macedonia 151 km, Montenegro 172 km, Kosovo 112 km
<b>Coastline:</b>	362 km on Adriatic and Ionian Sea (strategic location along Strait of Otranto)
<b>Average age of inhabitants:</b>	35.3 years (from 30.6 years in 2001);
<b>Natural resources</b>	Petroleum, natural gas, coal, bauxite, chromite, copper, iron ore, nickel, salt, timber, hydropower.

Source: Population and Housing Census 2011, INSTAT.

#### *Socialist era (1945-1990)*

The socialist era has been defined and referred to in literature as one of the most severe communist regimes ever installed in the South East European Countries (SEEC). The approximately 45 years of communist, centrally planned economy led to unbearable economic and social costs. Despite being a well-endowed country in natural resources (arable lands, minerals, metals, waters, coasts, young population) combined with a very favorable geographic position, the country never succeeded in becoming a well-developed country. In presence of an inappropriate use of disposable resources, directing of enormous amounts of financial resources in low productivity investments, centralization of every aspect of economic activity, widespread social repression, expropriation and absolute denial of private property rights and the cut-off of international relations led, around the '80s, to an almost autarchic – self-sufficient, closed (capital and current account transactions totally under strict control) and tremendously underdeveloped economy. Given the unsustainable – survivable situation, economic and political revolution became immediate, the only solution to the dramatic economic and social situation for a country in the center of Europe was experiencing.

### ***Democratic revolution (from the 90's)***

The dramatic economic and social situation at the end of the '80s fueled the popularly called "*students' movement*" in a democratic revolution in the beginning of the 90's, inspired by a total rejection of everything hereditary from the previous regime. The beginning of the 90's witnessed the Albanian transformation from a centrally planned toward an open market economy through a combined and simultaneous process of economic and financial liberalization, democratization and accelerated privatizations process. The first package of measures adopted by the Albanian government in June 1992 with the support of the "stand-by agreement" with the International Monetary Fund (IMF) included: (i) the macroeconomic stabilization (fiscal consolidation, public debt management and inflation control) and reformation of the financial system; (ii) price liberalizations and removal of subsidies; (iii) constitution a free market based economy and free business initiative, private property and progressive privatization process, openness to international trade through elimination of the state monopoly on foreign trade and currency convertibility. The process, in its entirety, was implemented with the valuable support of the International Monetary Fund and World Bank. The "*invisible hand*" of the (newly constituted) market mechanisms was assigned the function of distributing the available resources to the best uses, but with arguable success. According to Bundo, Luçi, and Cane (2005) goods market was the first to be installed in Albania, since trade and tradable activities may be exercised even in presence of limited finance. Also, the transition process required the establishment of a new enriched institutional setting, a new regulatory framework in order to facilitate the emergence of a healthy and significant private sector. Due to the lack of solid institutional arrangements and weak formal financial markets, among other weaknesses, it took a while for the private sector to surge and contribute to the overall economic growth of the country. Further, the half a century suppression of every kind of entrepreneurial initiative and private property, acted as an obstacle to the open market transformation of the Albanian economy. The emergence of the private sector, entrenched with massive migration, mitigated somehow the economic – social cost of the planned economy collapse. Overall the economy grew progressively even with double digit rates driven by consumption and investments, but also relying in external anchors such as the IMF surveillance (first agreement in 1991), World Bank and the EU institutions (EU relation installed in June, 1991). The labor market suffered the massive internal and external migration, especially brain drain abroad, which accompanied the

first years of transition and deficiencies on the supply side in proceeding years. The weak and not efficient production factor's markets (labor market, not well developed financial markets, land and property rights still not fully settled) and a fragile macroeconomic environment were the main determinant factors of the current under potential economic growth and the not so optimistic future prospects.

### ***The new growth model of Albania***

As the economic development proceeded and huge structural changes took place over the years, a consumption driven growth model (Fullani, 2012) was established in Albania. The outbreak of the last global financial – economic crises highlighted the deficiencies of the Albanian economy, the long run unsustainability and inappropriateness of the consumption driven economic model. Strong domestic demand (main driver of economic growth in the last 20 years) defined large current account deficits, in turn financed prevalently from: remittances, public assets privatization and inflows of foreign direct investments. Financial intermediation, based mainly on deposits and capital, nourished prevalently the non-tradable sectors of the economy (those presenting the highest growth rates), and less the tradable ones. Consequently, high imports of consumption and investment goods determined trade and current account imbalances. Today, the external financing sources seem to be drying up with the privatizations programme soon to be concluded, the migration cycle coming to maturity and the difficulties in Greek and Italian labor markets leading to a declining trend of remittances and a reverse process in emigration (migrants are returning in Albania). The dry up of this external financing sources combined with a contraction of financial intermediation from the Albanian banking system, determined a sluggish domestic demand and low investment levels, thus hindering overall economic growth. Those main drivers, who nourished economic growth in the last two decades, now result to be exhausted, thus new ones have become indispensable. Despite the global economic downturn, the inflow of foreign direct investment have grown steadily (partly on the back of privatization process) guided prevalently from labor cost factors. In a globalized economy, labor costs are not sufficient to attract foreign investors, especially after a threshold level. A friendly – favorable overall business environment and well-trained-specialized work force seems the key to attracting foreign direct investments toward the tradable sectors of the economy. It is important to note that more than a source of external financing, FDI's (especially

those called Greenfield FDI's) represent a conduit of new technologies and know-how in the destination country. Nurtured by the re-orientation of financial intermediation toward high productivity investment projects, especially on the tradable sector, finance can catalyze the growth process in Albania. Existing abundant resources should be mixed in an innovative and efficient way in order to create unique comparative advantages which in turn would enhance the competitiveness (beyond price competitiveness) of the Albanian economy and an export led growth. Thus, facing the XXI<sup>th</sup> century challenges, a new different growth model, centered in the quality of human capital, represent a precondition in promoting and boosting long run sustainable economic development of the country.

### ***Macroeconomic outlook in Albania***

A consumption driven growth model has fostered the Albanian economy since the first years of transition. For many years it has constituted the main driver of investments and growth, relying heavily on imported goods. Since the emergence and spreading of the global financial – economic crisis, the consumption based growth model signaled its inappropriateness for long run growth and development of the country. The latest available data on the main macroeconomic indicators for 2013 suggest for a slow economic growth, given the high internal and external surrounding uncertainties, tight financing policies followed by the banking system and the weaknesses of the domestic demand.

Table 2. Main macroeconomic indicators

	2008	2009	2010	2011	2012	2013
<b>Inflation (y-o-y, average, in %)</b>						
Core Inflation (in %)	2.8	1.4	1.7	3.0	1.5	0.3
Total inflation (in %)	3.4	2.3	3.6	3.5	2.0	1.9
<b>Economic Growth</b>						
Real GDP growth rate (in %)	7.5	3.3	3.8 <sup>1</sup>	3.0	1.3	0.4 <sup>2</sup>
Nominal GDP (ALL million)	1,089,293	1,148,082	1,222,462	1,282,255	NA	NA
<b>Labour Market</b>						
Employed (/000)	974.1	899.3	916.9	928.0	955.0	966.0 <sup>2</sup>
Unemployment Rate (in %)	12.7	13.7	13.5	13.3	13.0	12.8 <sup>2</sup>
<b>Fiscal Sector</b>						
Fiscal Balance (incl. grants, % on GDP)	-5.5	-7.0	-3.1	-3.6	-3.5	-4.8
Public Debt ( % of GDP)	54.7	59.4	58.0	59.7	61.7	63.9 <sup>2</sup>
Revenues (% of GDP)	26.7	26.0	26.6	25.8	24.9	24.1
Expenditures (% on GDP)	32.3	33.0	29.7	29.4	28.4	28.9
<b>External Sector</b>						



Current Account (% on GDP)	-15.6	-15.3	-11.5	-13.0	-10.7	-9.9 <sup>2</sup>
Goods imports (fob, % on GDP)	37.7	35.1	36.7	39.9	37.0	34.0 <sup>2</sup>
Goods exports (fob, % on GDP)	10.3	8.6	13.2	15.4	16.0	17.9 <sup>2</sup>
Foreign direct investments (inflow, % on GDP)	7.5	8.2	8.9	8.2	7.8	9.8 <sup>2</sup>
Foreign Reserve Assets (EUR million)	1,675	1,646	1,904	1,912	1,972	2,015 <sup>1</sup>
<b>Monetary and Financial Sector</b>						
Repo rate (end of period)	6.25	5.25	5.00	4.75	4.00	3.00
M3 Aggregate (y-o-y, end of period)	7.7	6.8	12.5	9.2	5.0	2.3 <sup>1</sup>
Credit to Private Sector (y-o-y, end of period)	32.2	11.7	10.6	10.4	1.5	-1.2 <sup>1</sup>
12M Yield (annual average)	8.16	9.17	7.98	7.34	7.03	5.16
Average USD/Lek ER	83.9	95.0	103.9	100.8	108.2	105.7
Average EUR/Lek ER	122.8	132.1	137.8	140.3	139.0	140.3
Nominal Effective ER, NEER	99.7	107.1	113.4	113.8	113.3	113.7

Source: INSTAT, Ministry of Finance, Bank of Albania and IMF assessments.

<sup>1</sup> Preliminary data.

<sup>2</sup> Nine months period average and end of the third quarter for the data relating labour market, external sector and public debt.

\*All ratios on GDP are based on annual projections of GDP.

Starting from 2008, real GDP growth rate has followed a sensible moderation resulting in about 0.4% in 2013, the lowest value of this indicator in the last decade and notably below its potential. The low real economic growth rate was not sufficient to employ all production capacities available in the economy, in turn generating low inflationary pressures. Economic growth during 2013 was primarily driven by the foreign demand while domestic demand is assessed as weak. For 2013, average inflation rate stood at 1.9%, below the objective of the Bank of Albania (3%) and below the lower target range (2%-4%). Labour market indicators indicate for a downward trend in the unemployment rate suggesting for lower pressures on wages and labour costs. Indicators from the fiscal sector show stimulating patterns, expressed in higher expenditures and fiscal deficits. Public debt increased to 63.9% of nominal GDP during 2013, exceeding the EU criteria of 60% of GDP. The external sector of the economy marked some improvement during 2013, with current account narrowing and capital and financial account improvement. Low domestic demand determined a lower level of imports in the economy. Meanwhile, exports continued to grow steadily, although at a slower pace compared to the previous years. The accommodating – easing monetary policy implemented since the surge of the financial crisis was reflected in higher liquidity and lower interest rates (at the historical minimum). M3 growth rate moderated during 2013 (with deposits constituting about 82.7% of broad money indicator in 2013), reflecting household's preferences on other investing instruments (longer maturity bonds) and low domestic demand for money. Slow economic activity, higher uncertainties for future developments, low capacity utilization rate determined a low demand for loans by both

enterprises and households. On the supply side, banks continue to follow a conservatory lending policy reflecting higher perceived risks. All of these developments entrenched with a stable exchange rate with the two main foreign currencies USD and EURO safeguarded somewhat macroeconomic and financial stability over the year 2013.

Despite stimulating economic and financial policies implemented in the last year, aggregate demand and overall economic growth continued to be weak. That is a reflection of the conservatory – low risk oriented behaviour of economic agents, which entrenched with external sector vulnerabilities determine economic growth rate to be below its potential. From a structural point of view, the Albanian economy suffers from a low efficiency, low diversification and low competitiveness in international markets, political and legal instability which doesn't allow for higher inflows of foreign direct investments. Also, the economy remains oriented to non-tradable goods, which serve only the internal market. Services and construction sectors of the economy have absorbed huge amounts of capital over years but growth in both sectors has stopped. The construction sector from time is facing liquidity problems, a halt on construction permits, high inventories and low efficiency. In such circumstances, long term sustainable growth requires the reallocation of financial resources to more productive uses in order to generate sustainable growth sources, reorientation of labour market and increase of productivity, stimulation of exporting sectors of the economy and those industries competing with imported goods. This process will require time to be implemented and should be supported by appropriate structural reforms and macroeconomic accommodating policies. In the meantime, the IMF agreement subscribed at the beginning of 2014, the EU integration process requirements (Boka and Torluccio, 2013) will impose those external constraints to the Albanian authorities for a long-term sustainable growth.

### II.3 Financial sector developments in Albania

The financial system development is generally viewed as an important promoter of a country's economic development. The Albanian financial system, shaped as a universal bank-based system, has undergone considerable structural changes over the last two decades. Despite qualitative and quantitative progress in terms of financial intermediates, instruments and markets, Albania still lacks behind countries in the Region. There is a vast body of literature

suggesting that the shape of the financial system should be in line and determines the stage of economic development of a country. The most important thing is to set-up a financial sector which better serves the most competitive sectors of the economy. In mid-low income countries, SME's are the training force and main determinant of economic development. Thus, advanced stock markets are unlikely to be a major force for the economic development since they are not the best conduit for providing finance to small and medium – sized businesses which characterize the early stages of countries economic development. Generally, banks, microfinance institutions and non-banking institutions are the best entities for providing financial services to this kind of enterprises. That may be the case of Albania: shaping the financial system as a universal bank based system might have been appropriate given the structure and the needs of the economy, at least till the third quarter of 2008. After that, something happened, the universal bank seems not enough to stimulate economic growth of the country. Also among others, a new challenge such as the evolution of the EU integration process requires the establishment of a well-developed financial system able to conduit sufficient financial resources to the best uses in the real economy.

In this section, we will briefly give the definition and the main functions of the financial system in general. A presentation of the main stages of development of the financial system, with special emphasis on banking system, will be presented following a general historical perspective. Also, the current structure of the financial sector will be presented.

### ***...definition of financial sector***

The World Bank (1989) defines the financial system as consisting of many institutions, instruments and markets. Usually, a financial system is the result of the combination of these three elements, in line with the characteristics of the respective country. In the financial intermediation literature, financial markets may be categorized broadly as bank based financial systems and market based financial system. Rousseau and Sylla (2001) argue that there are five key components of a good financial system:

- Sound public finances and public debt management;
- Stable monetary arrangements (medium of exchange, store of value, standard of deferred payments;

- Banking system, domestic and foreign or mixed;
- An efficient central bank to stabilize domestic finances and manage international financial relations;
- Well-functioning securities markets.

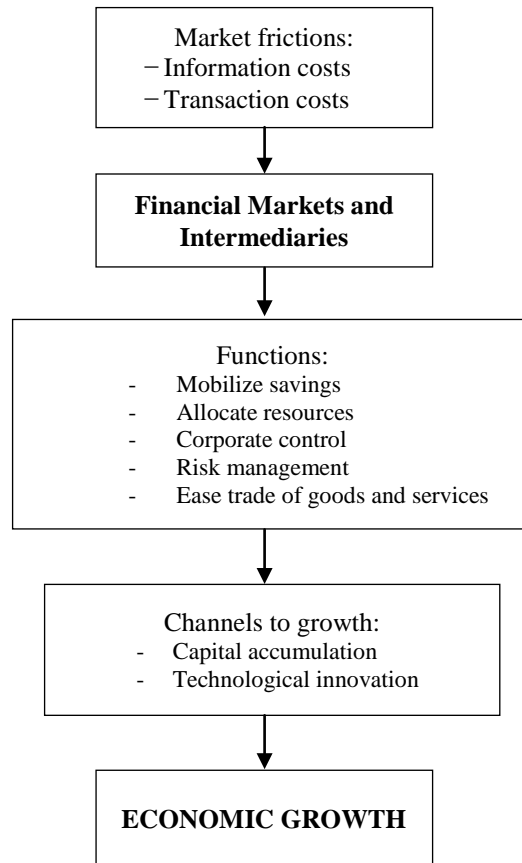
If such components are well established, financial systems may exert all of these functions to efficiently mobilize and allocate funds in order to promote economic growth of the country.

*...functions of the financial sector*

In the ideal world of Arrow (1964) and Debreu (1959), transaction and informational cost were absent, so that there was no reason for the existence of financial systems in the intermediation process of funds from savers to borrowers. But, in the real world, both these problems exist and should be addressed. According to Levine (1997) functional approach, financial systems emerge to mitigate informational and transactional frictions and their combination may determine the emergence various kind of contracts, institutions and markets. Thus, the primary function of the financial system concerns resource allocation, in time and space, in an environment surrounded by uncertainties. Levine (1997), in classifying the literature on economic growth and finance, breaks the primary function of the financial system in five basic functions:

- Information acquisition and resource allocation concerning the identification of most promising investment projects and allocate resources to the best uses;
- Savings mobilization which involves pooling and collecting financial resources from different saving units to channel to investments units.
- Exchange of goods and services facilitation through lower transaction costs as a medium of exchange easily recognizable.
- Manager and corporate governance control ex post resource allocations
- Risk management (trade, hedge, diversify and pool risks) in reference to liquidity and idiosyncratic risks.

Figure 1. A theoretical approach to finance and growth



Source: Levine (1997)

Thus, financial systems provide payment services, mobilize saving, allocate credit, manage risks etc. In different combinations, market agents such as households, enterprises, governments use the services offered by the financial system through different instruments (credit, bonds, stocks etc.) and institutions (banks, insurance companies, brokers etc.). The quality and quantity of financial services and the efficiency in their delivery determine the contribution of the financial system in the overall economy (World Bank, 1989). All the functions specified above, through capital accumulation and technological innovation, can boost overall economic growth<sup>1</sup>.

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<sup>1</sup> For an extensive discussion on the financial market functions see Levine 1997.

### *The financial system evolution in Albania*

In the last two decades the Albanian financial system has witnessed fundamental transformations up to the current relative stabilization. A great dynamism can be noticed in financial development after the year 2000, particularly in the banking system. New international banking groups entered the Albanian market, existing banks furtherly consolidated their position, and competition stimulated a relatively diversified supply of banking products. Alongside the positive development, difficult challenges also have been faced by the banking system. In this section we will briefly present the most important developments which can be categorized under: (i) financial system under the communist regime; (ii) after 1990's transformation and financial distresses of 1997 and 2002; (iii) current structure of the Albanian financial system in the context of EU harmonization and integration.

At the very beginning of the 1990's, Albania inherited from the communist – central planning system a very poor and underdeveloped financial system. To a large extent, the communist financial sector was represented only by public banks in a one tier level. The State Bank of Albania (from January 1945) had the function of a monetary authority and that of a second-tier bank. From 1949, a General Directorate for Savings (Drejtoria e Arkave të Kursimit) as established and acted as a depositing institution of public savings. Given the attention paid to the agriculture development, an Agricultural Bank was established with the main aim to provide funds to the agricultural sector of the economy. In 1953, alongside the savings accumulation function, the Savings Directorate embodied an additional function of public insurance of wealth yielding the Institute of Savings and Insurance (Instituti e Arkave të Kursimeve dhe Sigurimeve). All their activity consisted in passively providing funds to the state and firms according to a centrally coordinated plan. The Institute of Savings and Insurance (Instituti i Arkave të Kursimeve dhe Sigurimeve) exercised its activity until 31.07.1991, becoming later the Savings Bank (with law no. 7505). Also, given the agricultural orientation of the country, a Rural Bank (as a section of the Bank of State) was established and started to operate in January 1970. Its activity was strictly monitored and centrally planned till 1990 (with law no. 7378 it was transformed in the Rural Commercial Bank). Thus, the fragile financial system installed in the communist Albania suffered heavily a low financial intermediation, inexperienced management; accounting standards were missing and nonexistence risk assessment and management. Overall

we can conclude that during the 45 years of communist regime in Albania finance and growth were at best weakly correlated to each other, thus financial intermediation stood at very low levels.

The beginning of the 90's, among other transformations, witnessed important changes regarding the financial system. The first important pillar of this process was the transition from a mono-bank to a two-tier banking system, where the central bank exerts the traditional functions of a central bank (issuance of the currency, monetary policy, supervision etc.) and the commercial banks are authorized to raise deposits and allocate credit; the second is the privatization of the state owned banks and entry of new banks in the market; and the third pillar is a new comprehensive legal and regulatory framework. The two tier system was formalized with the law no. 7559, on 22 April, 1992, "*On the Bank of Albania*" and the law "*On Banks in the Republic of Albania*" which resulted in the creation of the Bank of Albania under the direct dependence of the Albanian Parliament (previously under complete control of the central government). The bank of Albania was granted the exclusive right to implement the monetary policy with the aim "*to maintain the internal and external stability of the domestic currency*" and the supervision of the banking system (and preparing the relative regulatory framework). Thus, the financial system at the time was constituted by the central bank (Bank of Albania), and three second level banks with state owned capital: National Commercial Bank (active from 1990), Savings Bank (hereditary of the savings Institute) and Rural Commercial Bank (which closed at the end of 1998 due to bad loans which accounted for about 90% total loans). Beside the state owned banks, two banks with mixed capital (foreign and state of Albania) entered the market: the Italian-Albanian Bank and the Arabian-Albanian Islamic Bank.

Table 3. Albanian banking system in 1992

<b>Banks</b>	<b>Ownership</b>
Bank of Albania	State owned
National Commercial Bank of Albania	State owned
Savings Bank of Albania	State owned
Savings Bank of Albania	State owned
Rural Commercial Bank of Albania	State owned
Italian-Albanian Bank	Joint venture (NCBA- Banca di Roma, Italy)
Albanian-Arabian Bank	Joint venture (NCBA- Arab Islamic Bank of Bahrain)

Source: (Ceca, Rexha, & Orhan, 2008)

In 1993, Dardania Bank was constituted from the government of Kosovo and in 1996 two other foreign (Greek) banks were licensed: Tirana Bank and a branch of the National Bank of Greece. The banking system, the only component of the financial system, was taking the first steps under a weak and what turned to be an inadequate regulatory framework. An important characteristic of the banking system was the dominance of the state owned banks, which accounted for about 90% of total deposits (Cani, 2004) but exerting low intermediation of available funds toward the private sector. As defined by Ceca, Rexha and Orhan (2008) the banking system tradition can be denominated as a “*slow motion process*”. At the time, the banking system could not satisfy the high demand for financial resources of the growing private sector of the economy. Credit rationalizing, the tightened lending policy through credit ceilings, and the high level of nonperforming loans resulted in a low supply of loanable funds. A novelty for the Albanian financial system was the establishment of the Tirana Stock Exchange based on the Law no. 8080 “*On the Securities*”, under the jurisdiction of the Bank of Albania. To date no companies have been listed. It had some marginal activity regarding treasury bills transactions, government bonds and privatization vouchers.

Table 4. Credit limit and realization (in ALL million)

	1993	1994	1995	1996
Credit limit	7.4	5.4	2.9	3.1
Realized	2.9	3.5	1.75	2.9
Realized (%)	39	64	60	95
Credit limit on GDP (%)	0.006	0.003	0.01	0.001

Source: Bank of Albania

Given the inability of the banking sector (focused prevalently on foreign exchange transactions and some trade financing) and the limited activity of TSE, the private sector demand for financial resources, at some point met the supply of loanable resources from the informal market. Also, households withdrew their deposits from the banking system offering the on the informal market, lured by the high interest’s rate they offered. Thus, huge amounts of capital flowed in the counters of this informal financial institution, obviously illegal since they were not licensed to collect deposits, while, investments in productive activities were minimal. At the time, public authorities were too weak to exercise control and were also suffering the lack of experience in an open market economy. Also, it was not clear who was responsible to supervise the informal market financial institutions. All of these factors nourished the informal economy growth in Albania (Boka and Torluccio, 2013a), culminating with the pyramid schemes collapse in 1997



with the inevitable loss of confidence on the money deposit institution and in the domestic currency beside other political, economic and social disasters that followed. Output shrank, inflation took the toll to about 40%, fiscal and current account deficit both widened markedly but the most devastating effects came from the civil disorder. In these conditions, the Bank of Albania acted prudently supplying overall liquidity needs of the banking system and of the government, intervention in the foreign exchange market to avoid speculative attacks and tried successfully to anchor public confidence on the banking system. Following the 1997 financial crisis, the failure of the state owned banks to perform their primary role in a market economy made the privatization and restructuring of the financial system an imperative. A new law regarding the banking system activity adopted in 1998 represented a milestone for the Albanian financial system and created normal conditions for banks operational activities. In accordance with the modern central banks and under recommendation of international institutions a new regulatory framework was approved with law no. 8269, dated 27.12.1997 “*On the Bank of Albania*” and law no. 8365 dated 02.07.1998 “*On Bank in the Republic of Albania*” that states that the Bank of Albania is the only supervising authority issuing licenses and supervising all banks in Albania. Further, the Article 161 of the Albanian Constitution (December, 1998), ratifies the status of the Bank of Albania. The new, well-structured and comprehensive regulatory framework stimulated new banks entrance in the market and a gradual increase in financial intermediation through new products and more loanable funds to the private sector of the economy.

Table 5. Banking system composition 1998 - 1999

Second tier banks at end of 1998	Second tier banks at the end 1999	Ownership
1. National Commercial Bank	1. National Commercial Bank	State owned
2. Savings Bank	2. Savings Bank	State owned
3. Italian-Albanian Bank	3. Italian-Albanian Bank	Joint venture
4. Arab Albanian Islamic Bank	4. Arab-Albanian Islamic Bank	Joint venture
5. Dardania Bank	5. Dardania Bank	Private bank
6. National Bank of Greece	6. National Bank of Greece	Branch of foreign bank
7. Tirana Bank	7. Tirana Bank	Private bank
8. International Commercial Bank	8. International Commercial Bank)	Private bank
9. Alpha Credit Bank	9. Alpha Credit Bank	Branch of foreign bank
10. American Bank of Albania	10. American Bank of Albania	Private bank
	11. FEFAD Bank	Private bank

	12. First Investment Bank	Branch of foreign bank
	13. Inter Commercial Bank	Private bank

Source: Bank of Albania.

From 1998 a relative stabilization can be noticed in the economy. Banks continued to implement a conservatory credit policy through rationalized credit, high interest rates tightened credit standards, with some shadows of the informal economy still present and inhibiting. The progressive entry of new banks in the market stimulated a higher financial intermediation: total deposits represented about 44.5% of nominal GDP and domestic credit amounted to about 47.8% of nominal GDP. Although following an upward trend these financial intermediation indicators are very low compared to those of neighbor countries and the region in general. Also, other problems like competitiveness in the banking system, insufficient crediting to the private sector, high foreign currency loans characterize the banking system in 2002.

In the spring of 2002, a new confidence crisis hit the Albanian banking system and a massive deposit withdrawal from the two biggest banks (the Savings Bank and National Commercial Bank) followed. According to Sheqeri (2003) the confidence crisis had its roots in the poor financial culture of Albanians in relation with the deposit insurance scheme, problems raised with the Savings Bank privatization and specific problems related to the CEO of one of the banks in the system. That said, differently unlike the 1997 crisis, it did not spread to other banks in the system and remained isolated in only two banks. Effects on the real economy were also limited to some temporal fluctuations of the exchange rate and some added inflationary pressures, partly inherited from the previous years. GDP growth rate moderated somewhat at the time was affected among others, from the power cut-off and political turmoil.

In summary, both of the shocks faced during the first two decades of the XX<sup>th</sup> century presented some common features (Sheqeri, 2003): macroeconomic problems entrenched with political instability, fragile financial system and an incapable banking sector.

With the finalization of the privatization process of the Savings Banks from the Raiffeisen International Bank AG in August 2014, banks in the system were obliged to reevaluate their business strategies, especially in relation to their lending policies, seeking to build their credit portfolio and consolidating their position in the market. On the supply side, banks in the system lowered interest rates, eased credit standard, applied more favorable terms and conditions and

started to introduce new financial instruments. On the demand side, both businesses and households were demanding external financial resources supported by the accelerated growth rate the economy was experiencing in presence of low inflationary pressures, decreasing unemployment rate, stability of the exchange rate, fiscal consolidation, wealth effects from the real estate market etc. Thus, higher competitiveness and dynamism in the banking system, wide supply of financial resources driven by an augmented credit demand from both private sector and households, triggered the credit boom of 2005-2007. Credit to the private sector increased by about 75% in annual terms in 2005 and continued to grow at more than 50% in annual terms till the beginning of the global financial crisis (2008Q3). The financial crisis from the USA escalated sharply at the end of 2008, spreading to the EU developed countries and later on to less developed economies such as the Central and Eastern European Countries. Albania neither could be immune! The evolution from a financial to an economic and then debt crisis especially in the European countries affected economic and financial developments in Albania. Strong economic (foreign trade and remittances flow) and banking sector ties with Italy and Greece exposed Albania to spillover effects of the global financial crisis. The low integration in international market of Albania and the relatively low level of financial deepening delayed for some time the direct effects of the financial crisis.

In the aftermath of the financial crisis, in the Albanian economy the first effects concerned some fluctuations in the banking sector confidence accompanied with deposit withdrawal, some liquidity problems increasing interest rates. During the last quarter of 2008 the effects of the financial crisis spread gradually to the real economy, GDP growth rate moderated and monetary indicators oscillated markedly (Bank of Albania, 2009). Banks reacted adopting conservatory lending policies, through tightened credit standards and tight terms and conditions. Some fluctuations were registered in the exchange rate which accentuated higher credit risk materialized in the higher level of non-performing loans (a large of credit is in foreign currency so that exchange rate fluctuations determine the repayment ability of borrowers). The immediate and precautionary reaction of the Bank of Albania, through liquidity injection and preserving public confidence in the banking system, mitigated successfully the first effects of the external global shock. Furthermore, the flexible exchange rate (Albania has adopted a managed-free

floating regime of the exchange rate) dampened the economy's growth rate deceleration and partly mitigated the effects of the external shock.

### *Current structure and development of the financial system in Albania*

As the financial sector continues to be shaped mainly as a universal bank – based system, with relevant foreign capital especially from EU financial institutions, other segments of the financial system have followed a moderate progress over time. Accounting for the challenges that the overall globalization process involves, the aspired European integration and the current performance of the economic growth model in Albania, the existence of a well performing banking system able to face international competitiveness, has become a key issue to future stable economic growth and development. The same development should follow even other segments of the financial market. Thus, the insurance market is the most developed among other non-banking financial institutions presents enough room for further development. Capital markets (Tirana Stock Exchange) and Private Pensions and Investments funds are still at an infant stage of development.

Table 6. Financial system components (% on GDP)

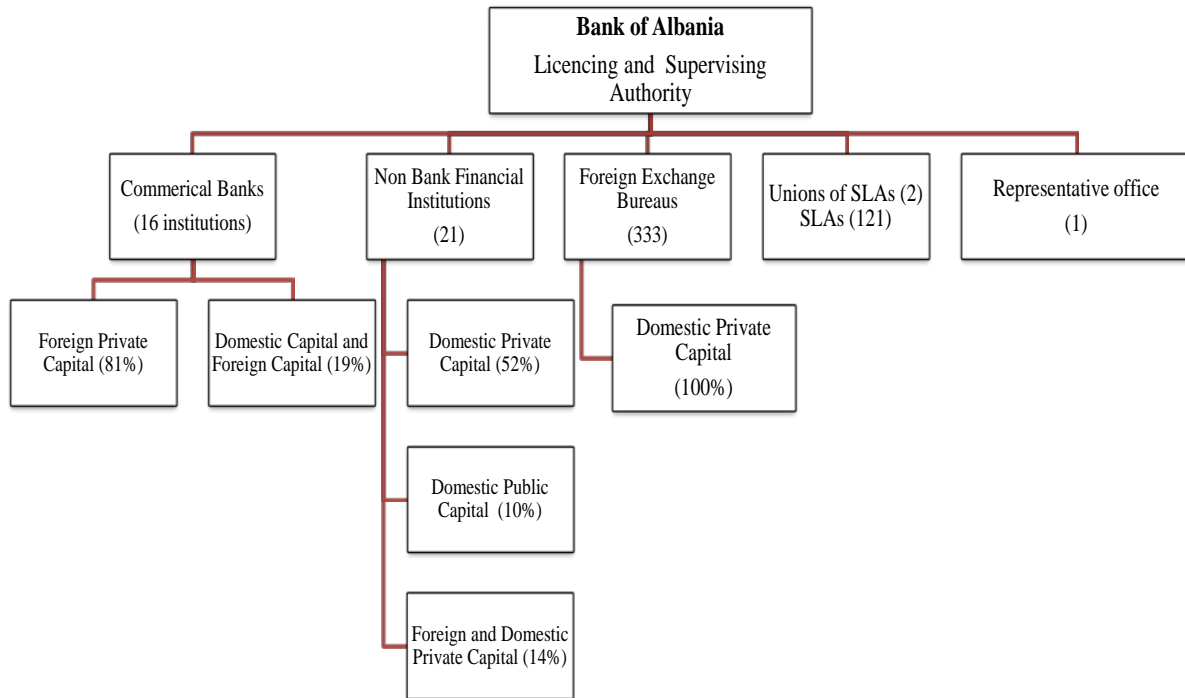
Licensing and Supervisory Authority	Financial System	2008	2009	2010	2011	2012	2013H1
Bank of Albania	<b>Banking system</b>	<b>76.7</b>	<b>77.5</b>	<b>80.9</b>	<b>84.7</b>	<b>87.9</b>	<b>88.7</b>
	Non – bank institutions	1.7	2.2	2.7	2.5	2.6	2.6
	Unions of SLAs and SLAs	0.7	0.8	0.8	0.7	0.7	0.7
Albanian Financial Supervisory Authority	Insurance Companies	1.4	1.5	1.4	1.5	1.5	1.6
	Pension Funds	-	0.01	0.01	0.01	0.02	0.02
	Investment Funds					1.1	1.8

Source: Bank of Albania, Albanian Supervision Authority.

### *... the banking system, some stylized facts:*

At the end of December 2013, the banking system of Albania consists of 16 universal commercial banks (retail and wholesale) exerting their activity throughout the Albanian territory via their agencies and branches. The Banks network consolidated from year to year till 2012, covering almost all the Albanian territory. Bank of Albania is the licensing and supervision of the banking and other institutions as following.

Figure 2. Institutions under the supervision and licensing of the Bank of Albania



Source: Bank of Albania

In 2013 some reverse trend can be observed due to deceleration of banking activity in the country. The total number of agencies and branches decreased by 9 agencies/ branches compared to the preceding year. Given the sluggish results on banking activity, some banks choose to cut operational costs by lowering the number of branches and agencies. The banking system has supported the economic growth of Albania since the beginning of the transition to an open market economy. Increasing lending activity triggered double high economic growth rates through higher investment and consumption until the global financial crisis. At the current stage of development, the banking system is considered consolidated, although there's enough room for important improvements. The latest data show that banking system accounts for about 88.7% of nominal GDP, Non-bank institutions account for 0.7% of GDP and Unions of SLAs and SLAs account for about 2.6% of GDP at the end of the first half of 2013.

Table 7. Banks specific shares on total banking system (in %)

	Total balance sheet	Permanent resources	Shareholders' Equity	Outstanding loans	Non-Performing Loans	Treasury bills	Securities	Total deposits
Raiffeisen Bank	23.2	24.9	23.2	21.8	24.0	17.4	30.5	23.7
National Commercial Bank	21.9	15.2	16.6	15.7	8.1	23.7	30.5	21.4
United Bank of Albania	0.5	0.9	1.1	0.3	0.6	0.8	0.0	0.5
Vento Bank	1.8	3.0	3.6	2.5	1.4	0.8	0.3	1.7
Tirana Bank	7.4	6.9	8.0	7.4	15.9	14.9	4.3	7.6
Nation Bank of Greece	3.2	3.8	2.4	4.9	7.1	4.5	1.1	3.2
International Commercial Bank	0.7	1.0	1.2	0.5	0.4	1.0	1.0	0.7
Alpha Bank	6.1	5.6	4.6	6.0	9.4	10.5	6.3	6.6
Intesa San Paolo Bank	11.0	11.6	13.7	8.9	12.2	7.8	16.6	11.2
ProCredit Bank	3.3	4.0	3.5	4.4	3.0	4.2	0.3	3.2
Credit Agricole Albania	2.4	3.7	2.9	3.7	5.3	1.0	0.0	1.9
Credit Bank of Albania	0.1	0.8	1.0	0.0	0.0	0.1	0.0	0.1
Credins Bank	8.8	10.4	8.6	13.2	8.2	5.7	0.4	9.0
Societe Generale Albania	5.6	5.3	6.3	6.9	2.6	5.4	3.9	5.5
Union Bank	2.6	1.8	2.1	2.5	1.3	1.7	2.8	2.7
First Investment Bank	1.4	1.1	1.2	1.2	0.6	0.5	1.9	1.3

Source: Bank of Albania

The latest data show that the banking system is dominated by the foreign capital (about 81% in 2012), and the rest from domestic and private foreign capital. Since the first years of transition, the Albanian banking market has attracted large inflows of foreign direct investments suggesting for high profitability of this sector. The three biggest banks (Raiffeisen, National Commercial Bank, Intesa-Sanpaolo Bank) dominating the market in term of credit to and deposits represent all international financial groups. At the same time, the low participation of domestic capital raises questions about the managerial capacity and entrepreneurship of Albanian business community.

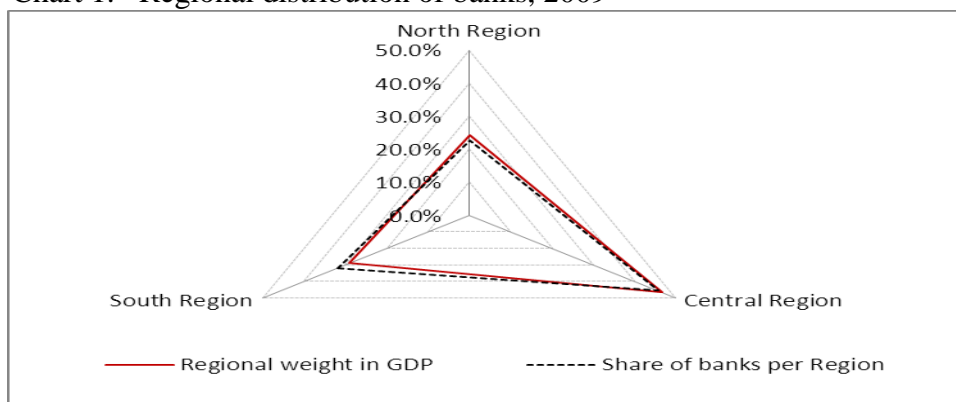
Table 8. Geographic distribution of banks by prefectures, as at the end of 2012.

Branches or Agencies in Albania							
	2007	2008	2009	2010	2011	2012	2013
Tirana	161	208	210	210	212	218	213
Durres	36	46	51	54	54	55	53
Fier	32	43	45	44	44	43	40
Elbasan	23	28	29	30	30	30	30
Korça	30	37	38	38	37	37	38
Shkodra	17	23	24	25	25	25	24
Vlora	32	38	39	41	41	42	41
Lezha	21	26	26	25	26	25	24
Berat	14	21	21	20	21	21	22
Gjirokastra	20	25	24	24	24	23	23
Kukës	6	8	9	9	10	9	9
Dibra	7	8	8	9	10	10	10
Branches or Agencies Abroad							
Greece				1			
Kosovo				1	1	1	1
<b>Total</b>	<b>399</b>	<b>511</b>	<b>524</b>	<b>531</b>	<b>535</b>	<b>539</b>	<b>530</b>

Source: Bank of Albania

The geographical distribution of banks (branches and agencies) shows a non-uniform distribution in the Albanian territory, determining development problems for the peripheral areas. Most of the banks have installed their agencies close to the most developed areas, especially the district confined to Tirana, Elbasan and Durrës. Other territories, especially those located in the North of Albania, are not fully served by the banking system. Under the profit maximization logic, the distribution of banks in the Albanian territory has followed the areas with highest number of enterprises, serving those territories mostly contributing to overall GDP.

Chart 1. Regional distribution of banks, 2009



Source: Bank of Albania, INSTAT

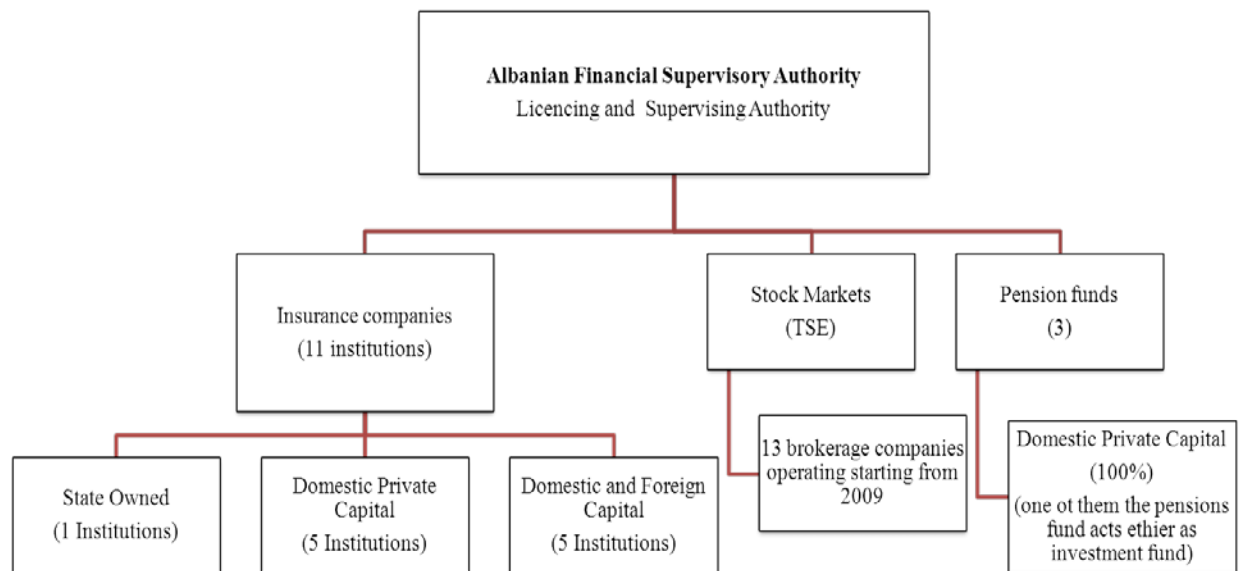
Note: The latest data on GDP distribution by regions regard year 2009. We use bank distribution by regions for the same period to build the chart.

Alongside the banking system there are as well 21 non- bank financial institutions specialized in lending and money transfer operations, 2 Unions of Savings and Lending Associations and 121 Saving and Loans association, about 333 Foreign exchange bureaus and 1 Representative Office (Representative Office of Popular Bank of Puglia in Albania). Although their share as a percentage of GDP is quite low compared to that of the banking sector, they have e key role in financing small entrepreneurs, especially in agriculture, who cannot access bank credit.

***...other segments of financial system***

As mentioned above, the other segments of the financial system are yet not or underdeveloped. Tirana Stock Exchange (TSE) is the most underdeveloped segment of the financial system for several reasons, not object of this study.

Figure 3. Institutions under AFSA, 2013.



Source: AFSA, 2013.

The absence of the capital market restricts heavily financing possibilities of businesses and other agents. The insurance market, although accounting for about 11 insurance companies, is not sufficiently developed. Some improvement was experienced with the market entry of international insurance groups. There are 3 private pension funds operating in Albania but their activity is too low, since the pension fund system is based on public funding (known as the



Social Insurance Scheme, Pay As You Go System). Three Private Pension Funds have been licensed in 2011 and one of them operates either as an investment fund. It has been gaining some popularity over the last two years, but, the low financial culture inhibits its further development. TSE, Insurance companies and Private Pension Funds are all supervised by the Albanian Financial Supervisory Authority.

*...some performance indicators:*

Total assets of the banking system, in absolute terms and as a percentage of GDP have followed an upward trend, although in certain periods at a slower pace. Spillover effects from neighbor countries and problems experienced in regional countries both are assessed to have affected the banking sector development.

Table 9. Banking system indicators

Indicator	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total Assets, (ALL Mill)	373.6	426.4	496.6	624.3	742.9	834.1	886.3	990.6	1120.2	1187.9	1,234.3
Total Assets/GDP	53.8	56.	60.9	70.8	76.8	76.7	77.5	81.0	86.1	87.9	89.8
Total Loans/GDP	7.3	9.3	15.7	22.4	30.2	36.5	39.3	40.1	40.0	42.7	41.3

Source: Bank of Albania

The main financing instrument of the banking system is represented by deposits and the main activity by loans, even though not at the desired level. Total credit to the economy witnessed a sensible slowdown in the last three years. Lower credit was translated structurally in higher level of nonperforming loans and shifting to T-bill investments.

Table 10. Quality of credit portfolio

NPL (%)	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
System	4.2	2.3	3.1	3.3	6.6	10.5	13.9	18.8	22.5	23.5
Private sector	5.4	2.6	3.5	3.6	7.6	12.3	15.5	20.8	26.0	na
Households sector	1.5	1.7	2.2	3	5.5	8.2	11.7	15.8	17.4	na
Domestic currency	1.9	1.7	2.8	3.9	7.5	10.1	14.4	16.9	19.5	na
Foreign currency	4.7	2.5	3.1	3.1	6.3	10.6	13.8	19.6	24.4	na

Source: Bank of Albania

The economic rate of return on average assets (ROA), determined as the ratio of net profits on total assets of the banking system, after the pronounced deterioration in 2008 started to pick up in the proceeding years. In 2011 another drop was marked and ROA resulted about 0.5% in 2013. The return on equity (ROE) indicator, determined as the ratio of net profits on equity, provides information in relation to the profit registered by a single accounting unit of the shareholder's investment in banks capital. Prior to the financial crisis, for every unit invested, shareholders were receiving about 20.7 in return. The breakthrough of the financial crises halved the ROE in 2008 and a progressive reduction has followed over time. A pickup in this indicator was marked in 2013.

Table 11. Banking system indicators, (in %).

	2007	2008	2009	2010	2011	2012	2013
ROA	1.6	0.9	0.4	0.7	0.1	0.3	0.5
ROE	20.7	11.4	4.6	7.6	0.8	3.8	6.4

Source: Bank of Albania

In presence of financial distress, special attention is paid to assets concentration, deposits and loans which can be measured by the Herfindahl (HI) index. The Herfindahl Index decreased following the 2008 turmoil and stabilized somewhat. Although decreasing, it still lags behind its optimum level.

Table 12. Herfindahl Index\*

Indicator	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
HI Assets	0.27	0.21	0.18	0.15	0.15	0.14	0.14	0.15	0.15	0.15
HI Deposits	0.31	0.24	0.20	0.17	0.17	0.15	0.16	0.16	0.15	0.16
HI Loans	0.11	0.10	0.11	0.12	0.11	0.11	0.11	0.12	0.12	0.12

Source: Bank of Albania

\*Herfindahl Index also known as Herfindahl-Hirschman Index (HHI) is an indicator of the competitiveness degree in the markets. Its values range from 0 to 1 with values close to 1 suggesting for a lower competition in the market and vice versa. Values below 0.01 indicate an almost perfect competition, values below 0.15 indicate for some concentration in the markets, values between 0.15-0.25 indicate for a moderate concentration and above 0.25 indicate a highly concentrated market.

Another feature of the banking system in Albania is related to the dollarization/euroization of the economy. Before Euro adoption a considerable share of deposits and loans were in USD. The introduction of the Euro marked some reverse tendency, foreign currency deposits and loans shifted from denominated in USD to Euro. The latest data on foreign currency depositing activity suggest for a progressive and yet slow pace increase of this ratio to about 48% of total deposits.

Instead, foreign currency lending activity accounted for more than 60% in the last decade. Usually, borrowers in Albania have been unaware about the exchange risks when contracting debts in foreign currency with income generated in domestic currency. The problem became evident especially in the aftermath of the financial crisis, reflected in higher level of non-performing loans. Thus, banks have introduced some new policies in order to promote lending in the currency borrowers realize their earnings (how much they have succeeded is discussable).

Table 13. Euroisation of deposits and loans (in % of total)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Foreing Currency Deposits/Total Deposits	31.4	31.2	29.0	30.1	34.6	37.6	41.7	42.1	44.3	47.9	48.3	48.8	48.0
Foreing Currency Lending/Total Lending	81.7	76.9	79.6	78.3	73.0	69.8	71.1	71.2	68.1	67.5	65.2	61.2	59.9

Source: Bank of Albania

Loan distribution by economic activity shows a continuing concentration in financing the trade and services sector of the economy over years. Following the difficulties in the construction sector, banks reoriented funds toward other sectors of the economy. From 2011, the industry has been attracting a higher amount of credit reaching the highest level of 28.8% of total credit to the economy in 2013. Agriculture still represents a problematic sector and banks are not willing to invest their resources. Land property rights, the lack of experience and disorganized farms are mentioned by banks as factors determining a tightening lending policy for this sector of the economy.

Table 14. Credit distribution by economic activity, (end of period, % on total credit)

	2007	2008	2009	2010	2011	2012	2013
Agriculture, hunting and forestry	1.34%	1.27%	1.25%	1.48%	1.70%	1.63%	1.80%
Industry	26.1%	24.7%	24.5%	23.5%	26.1%	27.9%	28.8%
Construction	21.1%	21.9%	20.4%	19.9%	18.2%	15.8%	14.0%
Trade	32.8%	32.9%	33.7%	34.5%	33.1%	34.3%	33.6%
Services	11.0%	11.3%	11.2%	11.5%	10.5%	11.9%	12.2%
Other services	7.7%	7.9%	7.1%	6.5%	7.1%	6.6%	7.5%

Source: Bank of Albania

*...banking system prices:*

Positive real deposit interest rates represent a key precondition for financial deepening, since it encourages savings in financial assets. Also, positive lending rates are very important since support deposits rates and promote investment projects with real positive rates of return (Lynch, 1996). Furthermore, as predicted by neoclassical and endogenous growth models, nominal interest rates should also present some flexibility to account for changes in inflation expectations. With the exception of the turbulent year 1997, a predomination of positive real interest rates can be noticed. Both deposits and lending rates have followed almost the same path, with a progressive stabilization following 2002. From the chart we can notice that lending rates are set at a margin above deposit rates, determining a positive intermediation spread.

Table 15. Lending and deposit weighted average interest rates.

	Deposit		Lending		Inflation
	Nominal*	Real**	Nominal*	Real**	
1995	13.75	5.77	19.22	11.24	7.98
1996	16.47	3.71	19.56	6.80	12.76
1997	29.69	(3.24)	30.28	(2.65)	32.93
1998	22.69	1.07	33.53	11.90	21.63
1999	13.22	12.82	23.47	23.07	0.40
2000	7.88	7.82	24.57	24.51	0.06
2001	7.11	4.00	16.12	13.01	3.12
2002	7.74	2.52	15.13	9.92	5.22
2003	7.23	4.86	13.13	10.75	2.38
2004	5.50	2.62	13.64	10.76	2.88
2005	4.34	1.97	13.70	11.33	2.37
2006	4.24	1.87	13.61	11.24	2.37
2007	4.66	1.72	13.57	10.62	2.94
2008	5.58	2.22	12.85	9.49	3.36
2009	5.46	3.22	13.59	11.35	2.24
2010	5.19	1.57	12.82	9.19	3.63
2011	4.92	1.49	11.92	8.50	3.43
2012	4.52	2.49	11.01	8.99	2.03
2013	3.66	1.60	10.32	8.25	2.07

Source: Bank of Albania, INSTAT

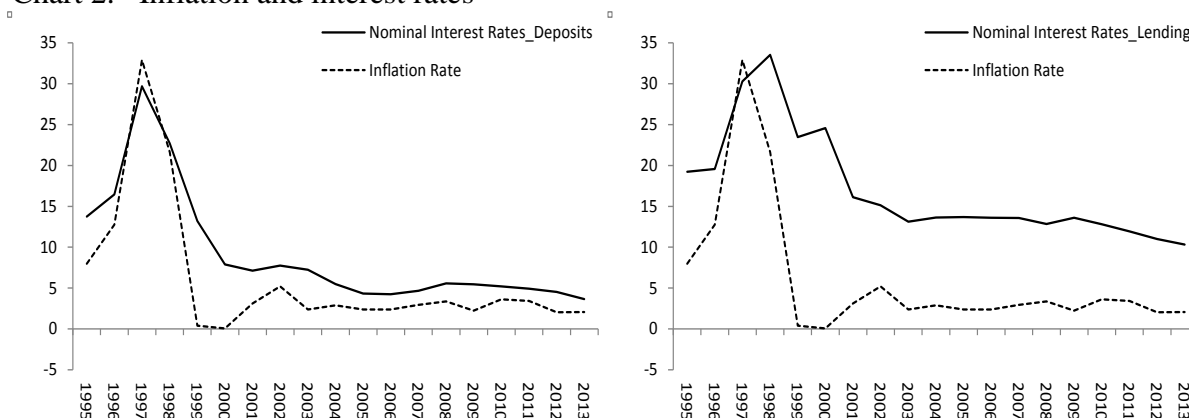
\*Average nominal interest rate on deposits and lending are calculated as a weighted average of interest rates for all maturities of deposits and credit in ALL.

\*\*Real interest rates on deposits and lending are calculated by subtracting consumer price inflation (annual changes) to nominal interest rates.

Under liberalized interest rates, an efficient financial market should facilitate adjustments to expected changes in economic conditions (Lynch, 1996). Data show that in the case of Albania,

interest rates on deposits and lending activity responded to shifts in the inflation level, thus showing good flexibility to changes in economic conditions. The gap between nominal interest rates and inflation is higher in lending data, reflecting somewhat higher uncertainties related to economic conditions and success of investment projects.

Chart 2. Inflation and interest rates



Source: Bank of Albania, INSTAT

On the contrary, with regard to lending interest rate volatilities, volatility in real interest rates is higher compared to nominal interest rate volatility. As aforementioned, until 2000 the Bank of Albania implemented its monetary policy through direct measures: credit limits for commercial banks and interest rate pavement on deposits (time deposits in ALL) by state owned banks as announced by the BoA. Following monetary base expansion, the direct measures aim to control money supply expansion. Restricting banking activity both on deposit and lending has hindered financial intermediation over this period.

Table 16. Interest rate volatility

	Deposit Volatility Rate		Lending Volatility Rate		Volatility Inflation Rate	Deposits Nominal-Real Volatility	Lending Nominal-Real Volatility
	Nominal	Real	Nominal	Real			
1995-2002	8.0	4.8	6.6	8.7	11.5	3.2	-2.1
2003-2013	0.9	1.0	1.2	1.2	0.6	-0.01	-0.01

Source: Bank of Albania, INSTAT

\*Volatility is measured as the standard deviation on annual data.

What results more important is that volatility followed a downward path in the sub-period 2003-2013 compared to the previous one. Thus, as suggested by the low volatility (almost at the same

level for nominal and real interest rates for both deposits and lending rates) some price efficiency might have occurred making investment evaluation less uncertain and suggesting for lower financial risks. The same for the nominal and real interest rates differential, both on deposits and lending.

*...products range:*

As the financial system develops, more sophisticated financial products should be introduced. The wider range of products determines a wider set of choices matching specific requirements for investors and borrowers, thus promoting financial services usage. The following table highlights the products offered by the Albanian banking system as by January 2014.

Businesses financial opportunities are limited to bank loans for investment and working capital financing. Investment banking, bond and equity markets, other institutional lenders are unknown for the Albanian market. Savings instruments are limited to deposits (time, demand) and some activity in T-bills (3, 6, 12 months maturity). Recently, interest has been shown by savers on the issuance of longer term government bonds (5, 7 and 10 year maturity bonds, issued sporadically). No information is available non risk management instruments (at least not in each of the official web pages of commercial banks).

Table 17. Banking system products

	e-Banking						Loans					Saving instruments		Current and Saving Accounts
	ATM	POS	Internet Banking	Phone banking	Mobile/SMS banking	Electronic cards	Mortgage	Consumer	Investment	Working Capital	Overdraft	Deposits	T-bills	Current and Saving Accounts
Alpha Bank Albania	a	a	a			a	a	a	a	a	a	a	a	a
Credins Bank	a	a	a			a	a	a	a	a	a	a	a	a
Crédit Agricole Bank (Albania)	a					a	a	a	a	a	a	a	a	a
Credit Bank of Albania	a		a			a	a	a	a	a	a	a	a	a
First Investment Bank Albania	a	a	a			a	a	a	a	a	a	a	a	a
International Commercial Bank	a					a	a	a	a	a	a	a	a	a
Intesa Sanpaolo Bank of Albania	a	a	a			a	a	a	a	a	a	a	a	a
National Commercial Bank	a	a	a		a	a	a	a	a	a	a	a	a	a
NBG Bank Albania	a					a	a	a	a	a	a	a	a	a
Procredit Bank	a	a	a			a	a	a	a	a	a	a	a	a
Raiffeisen Bank	a	a	a		a	a	a	a	a	a	a	a	a	a
Societe Generale Bank Albania	a		a			a	a	a	a	a	a	a	a	a
Tirana Bank	a		a	a	a	a	a	a	a	a	a	a	a	a
Union Bank	a		a		a	a	a	a	a	a	a	a	a	a
United Bank of Albania	a		a			a	a	a	a	a	a	a	a	a
Veneto Banka	a		a			a	a	a	a	a	a	a	a	a

Source: Bank of Albania, respective commercial banks web pages.

### **III. LITERATURE REVIEW**

For years economic growth differentials across the world have captured economic researchers' attention. Why do countries with similar characteristics grow at different rates? Economic growth literature proposed different explanations (theoretically and empirically) for these cross-country differences in growth: resource endowments, factor accumulation, educational issues, international trade, macroeconomic stability, institutional development and efficiency, legal systems effectiveness etc. Among others, an interesting critical factor such as financial markets development, received special attention over time in the economic growth literature. The consideration of financial markets development as a key growth accelerating factor broke ground to an extensive theoretical and empirical work, still ongoing. Both theoretical and empirical literature agree on the positive association between finance and economic growth, but, a contentious issue remains regarding the direction of causality between these two variables. Since the seminal works of Bagehot (1873), Schumpeter (1912), Robinson (1952), Gerschenkron (1962), the finance and growth nexus have fascinated many authors over time especially over the last two decades. Overall, empirical works have followed three main theoretical schools of thought which can be distinguished in: (i) structuralists, (ii) repressionists, (iii) and endogenous growth theory supporters. The finance-growth nexus has been explored (with different results) by using different methodologies (time series, panel data, or cross section analyses), different proxies for the related variables, distinguishing between bank-based and market-based financial systems and by considering different characteristics of the economy (such as trade openness, inflation, foreign direct investments, oil prices, regulatory frameworks etc.). However the direction of causality between economic growth and financial development still remains a controversial issue.

The literature concerning the finance – growth nexus will be analyzed following a chronological perspective on the evolution of this issue, reviewing the most relevant studies from the pioneering works to the most recent ones. Firstly, we will consider the literature on the finance and growth nexus, and secondly we will introduce the literature considering the effects of trade openness in the finance – growth nexus.



### III.1 The finance-growth nexus

#### III.1.1 The structuralists view: Finance promotes growth!

Although still attracting too much attention, the finance - growth relationship is not a recent discovery. For more than a century, renowned economists have been debating about the role of the financial system in the process of economic development. Such debate traces back to the work of Bagehot (1873) who argued that financial development played an important role in channeling the industrialization process in England through the mobilization of capital for “immense works”. According to Bagehot (1873), “*banks are the best engines that ever were invented for creating economic growth*”. Schumpeter (1912) aiming to analyze the importance of technological innovation in the long run growth pointed to the productivity and growth enhancing effects of financial services offered by well-developed financial systems. He argued that financial services constituted a paramount role in promoting economic growth. Also, Keynes (1930) considers banking system as an important driver of economic growth: “*bank credit is the pavement along which production travels, and the bankers if they knew their duty, would provide the transport facilities to just the extent that is required in order that the productive powers of the community can be employed at their full capacity (p.220)*”. In a later work, Keynes (1936) suggested a new alternative institutional structure including governmental direct control of investment. Robinson (1952) argued that it was economic growth to promote demand for different types of financial services stating that “*where enterprise leads, finance follows*”. Similar to Schumpeter (1912), Gurley and Shaw (1955) argue that financial system development is crucial in promoting economic growth. In his Europe’s industrial history approach to understand how countries develop, Gerschenkron (1962) put the role of the banking sector into the context of what he called “economic backwardness”: the degree of economic development of a country at the beginning of the industrialization process determined the role of its banking sector. Later, the propulsive role of the financial system in promoting economic growth has been extensively discussed in the works of Patrick (1966) and Goldsmith (1969)

Patrick (1966) tried to focus more specifically in the causal relationship between finance development and economic growth. According to his “stage of development hypothesis”, the causality direction between financial development and economic growth changes over time and it can be attributed to the specific stages of development process. He identified the phenomena in

which the creation and supply of financial services depends on their demand from investors and savers in the economy as “*demand following*”. In this case, “*the evolutionary development of the financial system is a continuing consequence of the pervasive, sweeping process of economic development*” (Patrick, 1966). The financial system, through channeling funds from slow growing sectors (industries) of the economy to fast growing ones, supports and sustains the leading sectors of the economy. From this point of view, economic growth leads financial development which is considered “*passive and permissive in the growth process*” (Patrick, 1966). The “*supply leading*” phenomena concerned the creation and supply of financial services in advance of demand for them. This is the case supply creates demand, similar to the Schumpeterian concept of innovation financing. In this case, financial system channels funds from small savers and slow – non growing sectors towards large investors and modern – high growth sectors of the economy. In particular, the supply leading patterns “*stimulates and promotes an entrepreneurial response*”, “*opens new horizons as to possible alternatives and enables the entrepreneur to think big*”. The supply leading pattern usually dominates in the early stages of economic development, inducing growth by financial means. As the economic development advances it gradually shifts its leading role to the “*demand following*” one. Patrick’s (1966) shed light and provided a comprehensive framework on the economic growth and financial development issue providing a clear-cut and empirically testable hypothesis (Eschenbach, 2004). Cameron (1972) provided historical case studies of 19th century successful industrialization processes considering the interactions between financial sector and economic growth. He found that a financial system may be growth inducing (Japan, Belgium and Russia) and growth induced (Germany before 1870). What makes the difference is the quality and efficiency with which they are provided by financial intermediaries.

Overall, the financial structuralists contend that financial development can boost growth through a direct effect on higher savings encouragement.

Goldsmith (1969), using a sample of 35 countries (when data were available), over the period from 1949 to 1963 and using the value of financial assets on GNP (called FIR financial interrelations ratio) as a proxy for financial development, stressed the connection between “*countries financial superstructure and its real infrastructure*”. Under the assumption that the size of the financial system is positively correlated to the provision and quality of financial

services, he found parallelism between economic growth and financial development and periods of higher growth were associated by an above-average rate of financial development for some of the countries. He suggested that the financial superstructure of a country “*accelerates economic growth and improves economic performance to the extent that it facilitates the migration of funds to the best user, i.e., to the place in the economic system where the funds will yield the highest social return*”. Among others, the main critique moved to Goldsmith’s work, also recognized by himself, relates to the fact that “*there is no possibility, however, of establishing with confidence the direction of the causal mechanisms, i.e., of deciding whether financial factors were responsible for the acceleration of economic development or whether financial development reflected economic growth whose mainsprings must be sought elsewhere (p.8)*”.

Using annual data from 1947 to 1982, Fritz (1984) tested for Patrick’s (1966) hypothesis in the case of Philippines. Time series causality tests support the view of Patrick (1966), according to which in the initial phases of developments causality runs from finance to economic growth. Later, the causal pattern reverses with the real economy demanding more sophisticated financial services.

Jung (1986) tested empirically the hypotheses provided by Patrick’s (1966), supply leading and demand following one. He employed Granger causality tests in a sample of 56 countries (divided in developed and developing countries) from 1950 to 1981. Financial development was proxied by the currency ratio, defined as the ratio of currency to the narrow definition of money (M1), and by the monetization variable defined as the ratio of M2 to nominal GNP (or GDP). Economic growth was proxied by per capita GNP or GDP, depending on data availability. He found that in cases in which financial development is proxied by currency ratios, causality runs from financial to economic development (supply leading evidence) in developing countries, and in the reverse direction for developed countries. The monetization variable does not appear to yield different results distinguishing between developed and developing countries in terms of the direction of causality.

### III.1.2 The 1970s: Financial repressionists – liberalization view

The pioneering works of Gerschenkron (1962), Patrick (1966), Cameron (1967) and Goldsmith (1969) on the financial development and economic growth dilemma induced a surge

of interest on the issue even considering other factors affecting it. In the 1970s, government intervention under credit ceilings, credit programmes, high reserve requirements etc., was common factors believed to promote growth. These kind of restrictions fall under the term of financial repression, which translates into low savings, credit rationing and low investments in the economy. In contrast to the Keynesian advocates of financial repression, McKinnon (1973) and Shaw (1973) introduced the financial liberalization element in the finance and growth nexus. First, they introduced the term of “*financially repressed economy*” in the literature to account for distortions in the capital market as a result of governmental intervention. Their argument was that a low interest rate - below market interest rates- reduces savings and in turn hinders growth. According to McKinnon (1973), the financial sector is important in the economic development. The intertemporal complementarity hypothesis outlined in McKinnon (1973) states that investors must accumulate deposits (or financial assets) in advance in order to finance their investment projects later. The higher deposits interest rates are, the lower is the opportunity cost of saving real balances to invest. This can be interpreted as incentive for firms to invest. If deposits real interest rates are low (or negative) firms cannot accumulate liquid assets to invest. Self-financing is then improved with the removal of interest ceilings. Since the model is based on the assumption that all units are constrained to self-financing and investment is subject to important indivisibilities, McKinnon’s model can be interpreted as an outside money model (Eschenbach, 2004). Shaw’s (1973) introduced the debt intermediation view by relaxing the intertemporal complementarity assumption considering not self-financing investors. He provides an explicit money approach in which financial intermediaries accumulate deposits, raise real returns to savers and increase their lending potential. Through economies of scale, risk diversification, lower information costs, and adjustable liquidity preferences. They lower real costs of borrowing to investors and increase investment efficiency. Higher deposits are translated into higher investments and economic growth will follow. Although from different theoretical approaches, McKinnon (1973) and Shaw (1973) approaches are complementary and they both argue in favor of interest rate liberalization (the equilibrium one which maximizes growth) and abolition of any other financial repression measure (selective or directed credit programmes, restriction of the competition in the banking sector by prohibiting free entrance). They conclude that financial liberalization promotes growth through savings mobilization. World Bank (1989) also argues in favor of the financial liberalization view, stating that an efficient financial system contributes to

higher level as well as to the mobilization of financial resources and directing them to the best uses.

McKinnon (1973) and Shaw (1973) developed a theoretical framework in which financial repression reduces both quality and quantity of investment, but, they did not provide a formal financial economic growth model. As an extension to McKinnon – Shaw (1973) framework, Kapur's (1976) model showed that financial liberalization (by letting nominal deposit interest rates be determined by market forces) enhances growth by improving the quantity of investments. Under circumstances of financial repression (such as interest rate ceilings) there is no risk premium, and therefore low yielding investments crowd out higher quality investments. Galbis (1977) showed that financial liberalization promotes growth by enhancing the quality of investments. Considering an open economy with capital mobility, in a context of fixed or managed exchange rate regime, Mathieson (1979) found that timing and internal – external coordination of reforms affects the quality of investments.

The neo-structuralists economists, who emerged at the beginning of 1980s, severely criticized the financial liberalization stream of thought introduced by McKinnon – Shaw school by introducing some key assumptions different from their framework. Among them, Van Wijnbergen (1982, 1983) and Taylor (1983) suggested that curb or not organized money markets (assumed to be efficient and competitive) determined whether financial liberalization can accelerate growth or not. The financial intermediation process by commercial banks is lower due to reserve requirements which they are subject to. Assuming that households hold only three types of substitutable financial assets (bank deposits, gold and curb market loans), higher bank deposit rates shift households' preferences to bank deposits substituting thus curb market loans. In this case, lower loanable funds will be available for investments which in turns inhibit aggregate output. Thus, neo-structuralists claim that in presence of efficient curb markets, financial liberalization is unlikely able to promote economic growth. Fry (1988) goes further in the argument, suggesting that curb markets may not be as efficient and competitive as commercial banks. The hypothesis of neo-structuralists that financial liberalization hinders growth in presence of curb markets does not hold. Another strand of literature considers the resource allocation efficiency and information asymmetries between borrowers and savers. Diamond (1984) affirmed that financial intermediaries minimize investment monitoring costs,

thus avoiding misallocation of financial resources. Boyed and Prescott (1985) emphasized the role of financial intermediaries (which are coalitions of agents) in alleviating asymmetric information problems, ensuring efficient resource allocation and fostering long run economic growth.

Gupta (1984) examines the experiences of a series of Asian and Latin America developing countries over the 1960-1970 periods. Using Sim's tests he examined the relationship between financial development and economic growth. He found that for the majority of the countries, causality runs from financial development to economic growth. In his work, Gupta (1984) used the industrial output as a proxy for economic growth, which represents only a small portion of total output and therefore does not represent a satisfactory proxy for economic growth. Using simultaneous equation model, Gupta (1986) considered the role of financial liberalization in India and South Korea. Although both countries present particularities in the way the liberalization process took place in each of them, they found that financial liberalization affected positively financial development and economic growth. Overall, they conclude that financial repression seriously harms the economic growth. In a later study, Gupta (1987) used pooled time-series and cross section data over the 1967 – 1976 period to estimate a model of savings for Asia, Latin America and the total sample. In this case he could not find unequivocal support for either the “financial repressionists” hypothesis or the “financial structuralists” hypothesis. However, in both groups of countries, he found that interest rates have a positive sign, *“thus lending some credence to the financial repressionists views that a liberalization of interest rates, say, by lifting ceilings on interest rates will be conducive to increasing savings in developing countries”*.

Besides the growing literature proposing the positive and growth enhancing properties of financial development, there are some well-known economists who consider finance totally irrelevant for growth. The Nobel Laureate in Economics, Robert Lucas in argued that the debate on the relationship between financial and economic development is *“badly overstressed”* (Lucas, 1988). Stern (1989) surveying the literature on development economics totally ignored financial development role in the process of economic development.

### III.1.3 The endogenous growth theory supporters

In early 1990s, the debate on finance and growth received new impulses from the evolution of endogenous growth models which incorporated the role of financial institutions. Trew (2006) summarizes some of the most influential finance and endogenous growth theoretical models differentiating in three aspects: types of endogenous growth, finance mechanism and treatment of asymmetric information.

Table 18. Core features of some finance and growth models

	Source of endogenous growth	Finance mechanism	Information problem
Bencivenga and Smith (1991)	Production externalities	insurance market and entrepreneurship	exogenous liquidity shock
Saint - Paul (1992)	Production externalities	capital market	exogenous productivity shock
King and Levine (1993 a, b)	Vertical innovation	entrepreneurial funding, heterogeneous agents	adverse selection (screening)
Bose and Kothren (1996)	Production externalities	contract or screen heterogeneous entrepreneurs	adverse selection (ration or screen)
De la Fuente and Marin (1996)	Horizontal innovation	funding and monitoring entrepreneurship	moral hazard (effort aversion)
Blacburn and Hung (1998)	Horizontal innovation	entrepreneurship, project appraisal, risk diversification	moral hazard (deceit)
De Gregorio and Kim (1998)	Human capital accumulation	credit market vs interrogational altruism	none
Morales (2003)	Vertical innovation + Capital accumulation	entrepreneurship, screening	moral hazard (effort aversion)
Aghion et al (2005)	Vertical innovation + Capital accumulation	entrepreneurship, credit constraints	moral hazard (deceit)
Blacburn et al (2005)	Production externalities	entrepreneurship, markets and banks	adverse selection and moral hazard

Source: Trew (2006), page 32.

The endogenous growth models support the leading role of finance through more efficient resource allocation and informational frictions alleviations, regardless of the sources of growth. Some policy implications arise too: financial liberalization fosters real growth! That follows the McKinnon-Shaw school vein of thought, though presenting differences in investment focus, and the trade-off between quantities versus quality. According to the McKinnon-Shaw school, financial liberalization through higher savings increases investments (a quantity approach). In the endogenous financial development and growth models the focus is on higher investment efficiency through resource allocation and information asymmetries reduction. Greenwood and Jovanovic (1990) developed a theoretical model in which both financial development and growth are endogenously determined. They found that financial development and economic growth are

*“inextricably linked”*. On one hand, by pooling idiosyncratic investment risks and reducing ex-ante uncertainties about return rates, financial development can foster growth; on the other hand, growth provides the means to implement and develop the financial structures.

Bencivenga and Smith (1991) found that under certain specified conditions, the introduction of financial intermediaries shift the composition of savings towards capital, causing intermediation to be growth promoting. Similarly, Bencivenga Smith and Starr (1995) found that in circumstances of higher capital market efficiency (lower transaction costs), agents engage in longer term, productive and transaction - intensive investments. Saint – Paul (1992) analyzed the impact of financial markets on technology choice. He found that markets allow for riskier technologies and technological choice affects the viability of financial markets. The model allows for multiple equilibriums: low equilibrium with underdeveloped financial markets and unspecialized technology and high equilibrium with developed financial markets and specialized technology. The mechanism may account for growth differences between countries.

In their valuable work, King and Levine (1993a and 1993b) employing an endogenous growth model, showed empirically that financial development of a country spurs long run economic growth. Using a sample of averaged data over 80 countries for the 1960 – 1989 period, King and Levine (1993a) investigated whether higher levels of financial development are significantly and robustly correlated with faster current and future rates of economic growth, physical capital accumulation and economic efficiency improvement. Financial development was proxied by four indicators: ratio of liquid liabilities to GDP, ratio of deposit money bank domestic assets to deposit money bank assets plus central bank domestic assets, credit to non-financial private firms to total credit (excluding credit to banks) and credit to non-financial private firms on GDP. Growth indicators were represented by per capita GDP growth, capital accumulation rate, ratio of domestic investment to GDP and a residual measure of efficiency improvements of physical capital allocation. They found that higher financial development was positively correlated to growth indicators before and after controlling for country and policy characteristics. Also, the predetermined component of financial development is a good predictor of long-run growth over the next 10-30 years. Built on the Schumpeterian view, King and Levine (1993b) developed an endogenous growth model featuring connection between finance, entrepreneurship and economic growth. They found that financial systems promote entrepreneurial activities which lead to



productivity improvements by (i) evaluating and choosing the most promising investment projects; (ii) mobilizing savings efficiently to finance promising projects; (iii) risk diversification for investors and (iiii) reveal the potential rewards to engaging in innovation relative to continuing to make existing products with existing techniques. Using cross country regressions and case studies they supported their idea that better financial systems promote higher productivity and economic growth by funneling financial resources to innovative, productivity enhancing and promising investment projects. In both their works, King and Levine (1993 a, b) showed that financial intermediation presented a good predictor of long run economic growth rates. Institutional distortions (such as deposit rate ceilings) hinder innovation and thus long run economic growth.

Differently from the financial liberalization supporters, the endogenous growth theory stresses the importance of cautious and fast development of stock markets, particularly in developing countries. From here, a debate on bank based or capital market based financial system followed. Based on an endogenous growth model, Levine (1991) argued that stock markets are found to be growth accelerating through “(1) *facilitating the ability to trade ownership of firms without disrupting the productive processes occurring within firms and (2) allowing agent to diversify portfolios*”. Atje and Jovanovic (1993), using data on 40 countries over the period 1970 – 1988 also found that stock markets positively affect both the level and the rate of economic growth. Subsequent studies, Demirgüç-Kunt and Maksimovic (1998) and Levine and Zervos (1998) also found a strong positive correlation between indicators of stock market development and economic growth. Rousseau and Wachtel (2000) employing data on 47 countries over the period 1980-1985 confirmed Levine and Zervos (1998) results. Using panel VARs they show the leading roles for stock market liquidity and the intensity of activity in traditional financial intermediaries on economic growth.

After the works of King and Levine (1993 a, b), the finance and growth nexus drew the interest and attention of numerous authors who explored empirically the relationship by using different methodologies (time series, panel data, cross section), different proxies for the related variables (economic growth and financial development), distinguishing between bank based and market based financial systems, and considering different aspects of the economy (such as trade openness, inflation, informal economy, regulatory framework, foreign direct investments etc.).

Despite the voluminous literature, the finance and growth nexus remains far from being a settled issue.

#### III.1.4 Further evidence on finance and growth nexus

##### *Cross section and panel data evidence*

Using annual data on about 100 countries for the period 1960-1985 and panel data on 12 Latin American countries over 1950-1985, De Gregorio and Guidotti (1995) found mixed results. In the first case, they found that financial development leads to improved economic performance. Also, the main transmission channel from finance to economic growth is represented by the higher investment efficiency rather than investment volume. Using six-year averages in a panel of 12 Latin American countries, they found evidence of a negative relationship between financial development and economic growth mainly due to the absence of a regulatory framework for the liberalization process and expectation of government bailouts.

Recognizing the external effects of financial development on economic growth and input factors productivity, Odedokun (1996) found strong support for the “finance causes growth” hypothesis. Using a sample of 71 low growth countries over varying periods spanning from 1960–1980, the author estimated regression equations for every country in the sample in order to get evidence on the causality issue. He came to the conclusion that: (i) in 85% of the countries, financial development promotes growth, (ii) compared to other factors considered as growth promoting in literature, financial intermediation is at par with exports expansion and capital formation ratio and superior to labor force growth in promoting economic growth, (iii) the growth promoting effects of financial development are higher in low income countries compared to high income LDC’s and (iiii) growth promoting effects of financial intermediation are almost invariant across regions of the globe.

Demetriades and Hussain (1996) explored the finance and growth causal links using annual data on 16 countries over the period 1960-1990. Using time series techniques they provided little support to the view that finance represents a leading sector in the process of economic development. They also found considerable evidence of bi-directionality and some reverse causation. In their findings they stress that causality patterns vary across countries and that statistical inference based on cross-country studies may be dangerous. Demetriades and Lunitel

(1996) using data from the Reserve Bank of India also found bi-directional causality between financial deepening and economic growth. Thus, policies aiming to exert influence on financial development are likely to affect economic growth and vice-versa.

Arestis and Demedriades (1996, 1997) reexamine the finance and growth causality patterns and found that cross section studies do not address the issue satisfactory. Country specific factors are likely to affect the causal nature of the relationship, which in turn is expected to vary across countries. According to Arestis and Demedriades (1996) the causality issue varies among countries due to institutional factors, financial sector policies and effectiveness of financial institutions in designing and implementing those policies. Also, the definition of the financial indicator (capital market and bank based financial systems) used in the analysis is of considerable importance.

Analyzing the historical evidence from five industrialized countries over the 1870 – 1929 period, Rousseau and Wachtel (1998), supported the leading role for financial intermediation for rapid industrial transformation in USA, UK, Canada, Norway and Sweden, while, feedback effects resulted insignificant. Using a multivariate VAR framework for 10 countries, Luintel and Khan (1999), using data on 10 countries, demonstrate that a bidirectional relationship exists between economic growth and financial development.

Using a large cross section sample and five years average panel of 159 (industrial and developing) countries over the period 1960-1999, Khan and Senhadji (2000) find a positive effect of financial development on economic growth but its size is sensitive depending on the proxies used for financial development, estimation method, data frequency and the functional form of the relationship. Levine, Loayza and Beck (2000) and Beck, Levine and Loayza (2000) using both dynamic panel data techniques and cross-country data found that financial development exert a large positive impact on economic growth through total factor productivity growth.

Using a large panel data set of 93 countries over the period 1970-1990, Graff (1999) found support for Patrick's hypothesis over the considered period. Finance matters for growth, it matters more in less developed countries and causation runs more from financial to real development with little evidence for mutual causation and no evidence for reverse pattern. An

important and distinctive finding is that finance matters more in countries with higher adult literacy (Graff 1999). In a subsequent study, Graff and Karmann (2001), for the period 1980-1990 showed empirically that finance was predominantly a supply leading determinant of growth. This finding cannot be confirmed for less developed countries.

Deidda and Fattouh (2002) applying a threshold model to King and Levine (1993) data set, found evidence that the relationship between interest rate, financial deepening and economic growth are positive only for developed countries. In less developed countries, high fixed resource costs related to financial services provision inhibits growth. They conclude in favor of a nonlinear relationship between financial liberalization and economic growth.

Calderón and Liu (2002) employed the Geweke decomposition test on pooled data of 109 developing and industrial countries over the period 1960 – 1994 to study the causal direction between financial development and economic growth. Their empirical results show five main findings: (i) that overall, financial development leads to prosperous economic growth; (ii) there is a bidirectional relationship between the two variables when the sample is split in developing and industrial countries; (iii) financial deepening has stronger effects to the causal relationship in developing countries; (iv) longer sample period allow for larger effects of financial development on economic growth and (v) financial deepening propels economic growth through both a more rapid capital accumulation and productivity growth, with the latter channel being more prominent.

Rioja and Valev (2003) investigated the channels through which financial development may affect economic growth in a panel of 74 industrial and developing counties during the period 1961-1995. Using GMM dynamic panel techniques, they found evidence of a strong positive influence of finance on productivity growth in more developed economies. In less developed region finance affects growth primarily through capital accumulation. In a later work, Rioja and Valev (2004) suggest that the positive effects of countries' financial development on economic growth may vary according to the level of financial development. They divide the sample of 74 countries in three regions and found that in the low region (the one with low financial development) improvements in financial development have uncertain effects on growth, while in the intermediate region a large positive effect on growth can be observed and in the high region, the effect is positive but smaller.

Back and Levine (2004) investigated the role of stock markets and banks on economic growth by using a panel data set for 40 countries during the period 1976 – 1998. On balance, they found that both stock markets and banks positively affect economic growth.

Using a combination of cross-sectional and time series data on 10 developing economies, Christopoulos and Tsionas (2004) explored the relationship between finance and economic growth. Apart from the drawback of both approaches, they found strong evidence in favor of the hypothesis that long run causality runs from finance to economic growth, the relationship is significant and there is no evidence of bidirectional causality. Also, no short run causality between financial deepening and output can be found.

Rousseau and Sylla (2005) suggest that a well-functioning financial system is central to economic growth. In their study, they bring together two strands of literature, the finance – growth nexus and that on capital market integration, and explores historically and empirically both of them. In a panel of 17 countries, using annual data for 1850 – 1997, they found evidence in support to the view that finance affects growth most emphatically in the earlier stages of economic development. Countries characterized by more sophisticated financial systems engage in more trade and appear more integrated with other economies by empirically identifying roles for both finance and trade in the absolute convergence in long term interest rates observed among Atlantic economies between 1850 and the start of the First World War. Evidence from historical case studies of the Dutch Republic, England, the U.S., France, Germany and Japan over the past three centuries, suggest that economic growth and increasing globalization of the Atlantic economies might indeed have been finance-led.

In a recent study, Pan and Wang (2013) apply a Bayesian dynamic factor model to explore the relationship between finance and growth. Using a sample of 89 countries divided in three different income groups (industrial countries, emerging market economies and other developing countries), they estimate the common, country and idiosyncratic factors that drive the dynamics and co-movement of financial development and economic growth over the period 1970-2009. They found that: (i) the common factor is of importance to explain output growth and financial development variance decompositions in less volatile economies; while the country factor is more important in more volatile economies, a pattern that is consistent in the different income groups of countries; (ii) other country characteristic variables, such as the level of income, the

size of the government and the of the manufacturing sector, and the interest rate spread show variations in explaining the cross-country patterns of the common and country factor variance decompositions in the different income groups of countries.

### *Time series evidence*

While cross countries studies, generally, assume that a possible relationship between finance and growth must run from finance to economic growth, studies using the time series approach address the causality issue (Blum, Federmaier, Fink, & Haiss, 2002). Granger causality tests are used broadly to define the causality direction in the finance and growth nexus.

Arestis, Demetriades, & Luintel (2001) studied the finance and growth nexus for Germany, USA, UK, Japan and France in the context of market- versus bank-based financial systems for the period of 1968-1998. Using time series techniques, they found that although stock markets and banks both contribute positively to economic growth, bank-based financial systems like those of Germany and Japan are better promoters of long run economic growth. Meanwhile, they acknowledge that results to some extent may highlight the international pattern that characterizes the UK and USA financial systems which in turn may result in a weaker finance – growth relationship.

Kar and Pentecost (2000) examined the relationship between financial development and economic growth in Turkey employing annual data for the period 1963 - 1995. In a vector correction model framework, they found evidence that the direction of causality between the variable is subject to the proxy used for financial development. However, they conclude that growth seems to lead financial sector development in Turkey. Using the same methodology for data related to 1970-2001 period, Ünalmiş, (2002) found different results on the causality issue. Except for one of the proxies of financial development, in the short run, financial development caused economic growth. In the long run, a bi-directional causality was observed. Ince (2011) found evidence of the presence of a strong relationship between economic growth and finance in the short run and causality running from finance to economic growth in Turkey over the period 1980 – 2010.

Thangavelu and Ang (2004) explored the finance (using capital market and bank indicators) and growth nexus in the case of Australia using a VAR model. Their findings contrast those of

Arestis, Demedriades and Lunitel (2001): economic growth Granger causes banking sector development and stock markets are essential in fuelling economic growth in line with the Schumpeterian view. In a bi-variate VAR framework, Waqabaca (2004) found a positive relationship between financial development and economic growth in Fiji over the 1970-2000 period, and causality running predominantly from economic growth to financial development.

Ang and McKibbin (2005) using time series data on Malaysia from 1960 to 2001 assessed the finance and growth link by taking into account savings, investments, and trade and real interest rates. They found that output growth causes financial depth in the long run. Law, Azman –Saini and Smith (2006) contributed to the debate on financial development and economic growth in Malaysia by using quarterly data from 1980 to 2002. Using a large set of indicators for financial development, taking into account real interest rates and capital stock, found that finance played a crucial role in economic growth promotion. In another study on Malaysia, Ang and McKibbin, (2007) investigated the finance – growth link by taking into account the real interest rates and financial repression. They found that financial liberalization stimulates financial sector development. Contrary to conventional findings, they found support for Robinson (1952) view in which economic growth causes financial development in the long run.

Chakraborty (2007) attempted to address empirically the causality relation between financial development and economic growth in India. Using quarterly data during 1996Q3 – 2005Q1, he investigated three empirical models: the whole economy to financial sector development, industrial sector growth to financial sector development, growth of services sector to the financial sector development. Overall, the empirical results suggest the existence of a stable long run relationship between stock market capitalization, bank credit and growth rate of GDP. Causality runs from real GDP growth rate to stock market capitalization. Industrial and services sector growth rates are found to be cointegrated with both stock market and banking sector development and causality runs from real growth to stock market capitalization. Overall, in the case of India, economic growth has Granger caused financial development, although the relationship results to be rather weak.

Perera and Paudel (2009) aimed to investigate the causal relationship between finance and growth in the case of Sri Lanka using time series data over the period 1955-2005. Using six alternative proxies for financial development, they found that broad money causes economic

growth with two way causality. Also, one-way causality running from private credit to economic growth is present. One way causality runs from economic growth to narrow money, total credit, private credit, and total domestic credit. Overall, the authors did not find strong empirical support for the view that financial development boosts economic growth in the case of Sri Lanka.

Using data over the period 1965-2007 for Ireland, Adamopoulos (2010) investigated the finance and growth nexus in the context of a VECM and taking into account the positive effects of the industrial production index. Using as proxies for financial development both banking and stock market indicators, Granger causality test indicated a bi-directional causality between economic growth and stock market development and a unidirectional causality running from economic growth and credit market development.

Considering both bank and stock market oriented approaches, Gurgul and Lach (2011) found that the direction of causality in Poland over the 2000-2009 period strongly depends on the particular area of the financial sector considered. When financial development is proxied by the stock market indicator, causality runs from financial development to economic growth. In the case of banking sector indicators, a reverse causal relationship can be observed. In a subsequent study on Poland, Gurgul and Lach (2012) extended the time series till 2011Q4 and accounted for the effects of global financial crisis. In the pre-crisis period (till 2008Q3), causality runs from stock market development to economic growth and from economic growth to banking sector development. The results corroborate those obtained in Gurgul and Lach (2011). When the whole sample is considered in order to account for the financial crisis effects, the results suggest for a higher influence of the banking sector on economic growth than before the crisis. Also, the positive impact of stock market indicator on economic growth before the crisis resized due to negative shocks occurred.

Craigwell, Wright and Carby (2012) and Carby, Craigwell, Wright and Wood (2012) seek to test Patrick's (1966) stage of development hypothesis in the case of Barbados for the period 1946 - 2011. Using M2 to GDP as a proxy for financial development and real GDP as a measure of economic growth, results support the demand following hypothesis throughout the entire sample and subsamples.



In a study on India, Kamat and Kamat (2007) explored the financial infrastructure and economic growth indicators relationship for the period from 1971-2004. In a VAR framework, they found robust empirical evidence in favor of a short run supply leading hypothesis. Hussain and Chakraborty (2012) examined empirically the dynamics of the casual relationship between financial development and economic growth in the context of the Indian state of Assam. In a VAR framework annual data for the period 1985 to 2009 have been used. Also, the principal component method was employed to build a financial depth indicator to be used as a proxy for financial development. Overall, they found that causality runs from financial development to economic growth suggesting that financial development in Assam needs to be plunged as it represents an important channel through which economic growth nourishes.

Ono (2012) provided time series evidence on the growth and finance issue in the Russian case. Employing a VEC model, the author found a bi-directional causality over the period 1999-2008; money supply led economic growth while economic growth led loans-to-GDP.

Maduka and Onwuka (2013) investigated both short and long run relationships between finance and growth using time series data in the case of Nigeria. For the sample period considered, the authors found a significant negative effect of financial markets on economic growth and argue that the supply of financial assets itself is not sufficient to stimulate the economic growth of the country. Torruam, Chiawa and Abur (2013) study the causal relationship between finance and growth in the case of Nigeria for the period 1990-2011 found a unidirectional causality running from economic growth to financial development. The outcome is similar to that of other countries with less sophisticated financial system. Ewetan and Okodua (2013) used time series data on Nigeria for the period 1981-2011 in a multivariate VAR-VECM framework to explore the causality direction between finance and growth. The empirical results confirm the long run relationship between financial development and economic growth in Nigeria, but causality direction depends on the proxy used for financial development.

Using Cobb-Douglas production functions augmented by incorporating financial development, Uddin, Sjo and Shahbaz (2013) re-examine the finance and growth nexus in Kenya over the period 1971-2011. They found that, conditional on the interest rate, labor and capital, development of the financial sector has positive impact on economic growth.

Ndlovu (2013) examined the causality issue on finance and economic growth in Zimbabwe for the period between 1980-2006, using stock market and banking system indicators along with three control variables namely: inflation, real interest rates and openness of the economy. He found that in the case of the Zimbabwean economy, financial system development is a passive reaction to economic growth, the result of the pressure for institutional development and modernized financial instruments by economic growth. The author motivates the reverse causality on the back of countries specific socio-economic, political and institutional history.

Reviewing the theoretical and empirical literature we can say that, most of the authors agree that there exists a strong and positive relationship between financial development and economic growth in the long run. Meanwhile, the causality issue seems to be far from being resolved. Other studies dealing with literature review on the topic support the same result (Levine 1997, 2005; Demetriades and Andrianova (2003); Eschenbach, 2004; Ang and McKibbin 2007). Empirical evidence shows an enormous heterogeneity in the results depending on methodologies employed, sample periods, countries or regions, variables used to proxy financial development and economic growth (Eschenbach, 2004; Trew, 2006) Surveying 67 studies on the effects of finance on growth and using meta-analysis methods, Valíčková, Havránek and Horváth (2013) found that heterogeneity is driven by both real factors and differences in research design.

### III.2 Financial development, trade openness and economic growth nexus

Beside the rich theoretical and empirical literature on growth and finance nexus, another strand of literature also considered the positive role of trade openness in promoting economic growth. Despite the considerable theoretical elaboration and empirical research the issue remains subject to controversy. In the growth literature, two competing frameworks can be distinguished: the neoclassical and endogenous growth theories. What differences these theories is whether policy changes affect economic growth in the long-run. In neoclassical models Solow (1956) technological changes were considered exogenous and not affected by the country's economic policy and degree of economic openness. In the new growth theories, supplying the missing explanation of long term growth, trade policy affects long run growth due to technological changes. In an open economy, the trade channel serves as a special vehicle transferring knowledge and technology and thus promoting economic growth. Prebisch (1950) and Singer (1950) are somehow skeptic about the effects of trade openness to economic growth. If

developing countries are lacking industrialization, decreasing international prices of raw materials and primary commodities would lead to higher differences between developed and developing countries. In developing countries, the industrialization process to start up and proceed requires some short – medium term protection of new born industries. In these countries, exports concern mainly raw materials and a few primary products and imports represent mostly manufactured goods. Thus, given the low price elasticity of developing countries' exports, they continuously face deteriorating terms of trade (Hamori and Razafimahefa, 2003). Jung and Marshall (1985) found inconclusive results from OLS regressions over a sample of 37 developing countries. The boosting effects of trade on growth have been evidenced by the new growth theory models led by Romer (1986) and Lucas (1988). According to Grossman and Helpman (1991) there are four channels through which openness boosts growth: (i) trade increases the availability of intermediate goods and capital equipment which promote productivity of country's other resources, (ii) permits developing countries to access improved technologies embodied in imported capital goods, (iii) allows for higher capacity utilization rates implying higher quantities of products produced and consumed and (iiii) offers access to new larger markets for domestic producers permitting them to reap benefits of economies of scale.

### III.2.1 Cross section and panel data evidence

Roubini & Sala-i-Martin (1991) analyzed the relation between trade regimes, financial development and economic growth performances in a large cross section of countries. Systematically they found that trade distortion have an adverse effect on growth, thus a negative relation between them. Also, they found that financial repression has negative consequences on growth. For the subsample of Latin American countries, a large fraction of the negative growth experience is explained by distortionary policies both in the trade and financial sectors.

Using cross section and panel data set for the period 1960-1987, Harrison (1995) found a positive association between growth and different measures of openness in developing countries and causality runs in both directions. Harrison (1995) considers that, in the case of trade, the concept of openness is synonym with neutrality: "*neutrality means that incentives are neutral between saving a unit of foreign exchange through import substitution and earning a unit of foreign exchange through exports*". An export promoting or import oriented economy cannot be

considered neutral in this sense. But, in average, it is possible for a regime to be neutral even in presence of intervention in some sectors (Harrison, 1995).

Vamvakidis (2002) checked the robustness of the growth – openness connection using a sample of developed and developing countries using cross section data over the period 1870-1990. Due to missing data, growth regressions have been estimated for the period 1920-1990. Interestingly enough, he found that there was not any correlation between trade openness and economic growth for the sub-period 1870–1970 (except for the interwar period during which negative correlation was evidenced). For the sub-period from 1970 to 1990, the results are in line with those of the literature, suggesting for a positive correlation between openness and growth. The significance of the relationship is sensitive to the proxy used to represent openness. The positive relationship between trade and growth seems to be phenomena of recent decades. The findings may suggest that a world economy with low protectionism is a prerequisite for openness to nurture growth. Thus, domestic trade policy should be aligned with the world trade policy.

Using the bounds testing approach to export and output data from 44 developing countries, Oskooee and Oyolola (2007) found support for the export led growth hypothesis in 60% of countries.

Employing the Pedroni co-integration technique on data of twenty nine Asian developing countries over the period 1994-2008, Hanh (2010) found bi- causality between trade openness and financial development/openness. Trade openness seems necessary to attract foreign capital inflows (financial openness) and in turn promoting financial system development. Thus, financial development and financial openness seem to be important preconditions for trade openness to take place in Asian developing countries. A novelty in their study is related to the impact of the financial crisis on trade and financial openness. Their results suggest that financial crisis have negative effects on financial and trade openness. The relationships between financial openness and financial development are heterogeneous, depending on the proxies used. Also, in the case the financial crisis does not have any direct impact on financial development, it can disturb financial development indirectly through two channels – financial and trade openness. The more a developing country depends on financial and trade openness, the more its financial system can suffer from a global financial crisis (Hahn, 2010).

Using panel data (fixed effect) method, Vaighan, Kazemi, Nezakati and Nia (2010) investigated the relationship among financial development, trade openness and economic growth for seven developing countries in the Central Asian countries over the period 1993-2008. The authors found a positive and significant bilateral relationship between finance and growth, but not between trade openness and economic growth.

Bordo & Rousseau (2011) studied the finance-trade-growth nexus using data since 1880 for seventeen economies and a set of cross country and dynamic panel data models. They found that before 1930, finance and trade reinforced each other, but the effects vanished after the Second World War. Financial development is found to have positive effects on economic growth over the sample period. In the meantime, trade openness affected economic growth independently and strongly after 1945, on the back of change in tariff regimes and restrictions imposed by the General Agreement on Tariffs and Trade (GATT), the establishing of the European Common Market and progressive abolition of capital controls after 1973 which completed the opening up process of international trade.

### III.2.2 Time series evidence

By means of different time series techniques and using annual data from 1975 – 1995, Siddiki (2002) explored the joint impact of financial and trade liberalization on economic growth. In line with the endogenous growth theory predictions, both trade and financial liberalization beside investment in human capital can boost economic growth. Thus, macroeconomic policies aiming education may speed up growth in the long run in the case of Bangladesh. Relying on previous research, findings that economic growth alleviates poverty Hassan and Islam (2005) examine whether trade openness and financial development can affect positively economic growth in the case of Bangladesh. Using annual data from 1974 to 2003 in a VAR framework, they found no empirical support for the trade led growth and growth led trade hypothesis. Also no support was found either for finance-led growth or growth-led finance hypothesis. Some bi directional causality is evidenced only between trade and financial development, when domestic credit-to GDP is used as a proxy for financial development. Overall, the authors suggest that both international trade and financial development do not alleviate poverty in the case of Bangladesh through their growth enhancing effects. A very recent work of Arouri, Uddin, Nawaz, Shahbaz and Teulon (2013) investigated the relationship

between finance, trade and economic growth in the case of Bangladesh over the 1975Q1-2011Q4. Using the structural break stationarity test to examine the integrating properties of the variables, the ARDL bound testing approach and an innovative accounting approach to explore causality; they show that the three variables are linked in the long run. Overall results indicate that financial development causes economic growth, supporting thus the supply leading hypothesis for Bangladesh. They also found support for the existence of a unidirectional causality running from financial development and economic growth to exports. On the other hand, imports cause growth and a feedback relationship exists between trade openness and economic growth.

Using a VAR model Dritsakis, Vazakides and Adamopoulos (2004) investigated empirically the relationship among financial development, economic growth and the degree of openness of the economy in the case of Greece. The three variables were found to be cointegrated over the period 1960Q1 -2000Q4, suggesting the presence of a long run relationship between these variables. Causality tests showed that there exist a strong bilateral causal relationship between financial development and economic growth and between trade openness and economic growth.

Employing data on a small open economy like Malaysia, Wong Hock (2005) explored the openness – financial development – economic growth issue. Using an augmented production function, they specify real per capita GDP as a function of capital, employment, a measure of trade openness and a measure financial development. The empirical results show that financial development and economic growth have a significant impact on GDP growth in Malaysia. Also they find strong evidence that trade openness causes economic growth. Granger causality between financial development and economic growth is found to be less robust and dependent on the measure used to proxy financial development.

In the case of Japan, Soukhakian (2007) used data covering the period 1960-2003 in order to investigate the causal relationship between financial development, trade openness and economic growth. They found that results depend on the proxy used for financial development. Empirical results show that a long run equilibrium relationship exists between financial development, trade openness and economic growth, except the case in which financial development is proxied by domestic credit. Granger causality tests suggest that financial development, when proxied by broad money, causes economic growth, supporting thus the supply leading hypothesis for the

Japanese economy and supporting the growth driven trade hypothesis, which claims that economic growth causes “more efficient imports and exports” for Japan.

Katircioglu, Kahyalar and Benar (2007) investigated the possible co-integration and causality direction between financial development, international trade and economic growth in the case of India. They employ time series techniques and annual data covering the period 1965-2004. Empirical results show that a long run equilibrium relationship can be found between the three considered variables but results are mixed. Neither the supply leading nor the demand following hypothesis can be inferred in the case of the Indian economy. Furthermore, the import led and export led hypothesis cannot be inferred too, based on the considered sample period.

Kar, Peker and Kaplan (2008) estimated the joint impact of trade liberalization and financial development on economic growth in the case of Turkey for the period 1963 – 2005. Using a simple endogenous growth model framework and principal component analysis to develop better measures for the aforementioned variables, they found that trade liberalization, financial development and the joint impact of both in terms of economic liberalization contributed positively to the Turkish economic growth over the considered period. Yucel (2009) examined the growth – finance – trade openness trilema for the Turkish economy during the 1989-2007 period. Their findings suggest that while trade openness has a positive effect, financial development have negative effects on economic growth. Financial development, trade openness and economic growth present a bi-directional causality suggesting that economic policies aiming the promotion of financial and trade development have a significant (statistically) impact on economic growth. In the case of Turkey, Savrun (2011) investigated the long run relationship between real income, financial development and international trade using data regarding the period 1960-2008. Granger causality tests suggested a unidirectional causality running from financial sector development to real income supporting the supply leading hypothesis; bi-directional causality between real income and international trade in the long term. Results show that financial development and trade openness (as measured by exports-to-GDP) represent two catalysts and are significant sources of real growth in the case of Turkey.

Chimobi (2010) investigated the causal relationship between finance-trade openness and economic growth in the case of Nigeria during the period 1970-2005. Under a VAR and Granger causality framework, Chimobi (2010) found positive effects of trade and financial development

on economic growth on the back of the causal impact they both present on GDP growth. Also, empirical results showed that economic growth is the main driver of financial development and trade openness. The findings of Chimobi (2010) in which growth has causal effects on trade openness implying support for growth led trade but no support for trade led growth corroborate those of Soukhakian (2007) in the case of Japan. Another look on the evidence on Nigeria over the period 1970-2010 was presented by Abubakar and Gani (2013). They found that in the long run, liquid liabilities of commercial banks and trade openness exert a significant and positive influence on economic growth. Conversely, they suggested that credit to private sector, interest rate spread and government expenditure exerts a significant negative influence on growth.

Tash and Sheidaei (2012) investigated empirically the joint impact of trade liberalization and financial development on economic growth in the case of Iran. They use the endogenous growth theory and principal component analysis on annual data for the period 1965 – 2009. Although presenting a negligible impact, trade liberalization and financial development contribute positively to economic growth. The authors identify as the main reasons behind their findings the weak management and disorganized condition under which the trade and financial liberalization process took place.



## IV. METHODOLOGY AND DATA

### IV.1 The methodology

Two different econometric techniques have been prevalently used in the literature to study the causal relationship between economic growth and financial development: cross-section, panel data and time series techniques. A great skepticism surrounds the conclusions obtained from cross country and panel data analysis since they generally do not account for country-specific growth path patterns, omitted variables and endogeneity. According to Arestis and Demedriades (1997), Lee (2005) cross country regressions refer to an “*average effect*”, which represents an important limitation when detecting causality direction since different countries present difference in their causality patterns. At this point, we will employ the time series technique in order to assess the causal relationships stated in the introductory part of this thesis. Arguments supporting the use of time series techniques can be found in Esso (2010), Rousseau and Watchel (1998), Arestis and Demedriades (1997), Trew (2006), according to whom this approach is more fruitful in addressing the causality because it accounts for the economic-specific structure of the economy among other issues. We employ the Granger – Causality test in a Vector Auto Regression (VAR) framework in order to examine the financial development and economic growth nexus: financial development, economic growth and trade openness nexus to explore the causality patterns of the stated relationships.

#### III.1.1 Model specifications

We can simplify by specifying our primary model showing the casual relationship between economic growth and financial development in Albania as:

$$\text{Bivariate model: } EG_t = f(FD_{it}) \quad (1)$$

In a secondary model we will introduce an intermediate variable, which is trade openness. So the model can be written as:

$$\text{Trivariate model: } EG_t = f(FD_{it}, TO_t) \quad (2)$$

Both the models can be written in a log linear format:

$$\log(EG_t) = \alpha_0 + \alpha_1 \log(FD_{it}) + \varepsilon_t \quad (3)$$

and

$$\log(EG_t) = \alpha_0 + \alpha_1 \log(FD_{it}) + \alpha_2 \log(TO_t) + \varepsilon_t \quad (4)$$

Where:

EG is economic growth proxied by quarterly real GDP;

FD is financial development proxied by **13** measures;

TO is trade openness measured as the sum of imports and exports to GDP;

$\alpha_0$  is a constant term;

$t$  is a time trend;

$\varepsilon$  is the random error term.

### III.1.2 Estimation technique

The Granger – Causality test in a Vector Auto Regression (VAR) framework will be employed to explore the causality patterns between financial development and economic growth, and between financial development, economic growth and trade openness. For this purpose we will proceed as follows: (i) testing for the integration order of the variables; (ii) cointegration analysis and (iii) performing Granger causality tests in a VAR-VECM framework.

#### *Unit root tests*

Usually, macroeconomic time series seem to contain unit roots. Thus, standard econometric techniques require, before undertaking any empirical analysis, the investigation of the time series properties in terms of unit roots. Not carrying out this type of analysis and applying regression analysis on non-stationary data invalidates many of the statistical tests (t tests, F tests etc.) and inferences drawn are likely to be erroneous and misleading. Also, the existence of unit roots in the time series implies that a shock in the residuals has permanent impacts on the dependent variable. There are different tests used to examine the stationarity properties of the time series, characterized by different powers and sample size Gujarati (2004). In order to determine whether a time series is stationary or not two standard unit roots test are employed: the augmented Dickey – Fuller (ADF) test and the Phillips-Perron (PP) test.

#### *Augmented Dickey Fuller (ADF)*

Dickey and Fuller (1979, 1981) proposed the Augmented Dickey – Fuller (ADF) test in order to test for the integration order of a time series. As an extension to the Dickey and Fuller

(DF) test, which assumed uncorrelated error terms, the ADF introduces the lagged values of the independent variable in the equation to accommodate some forms of serial correlation in the error terms. The general form of the ADF test can be estimated using the following regressions as stated in Gujarati (2004):

$Y_t$  is a random walk:

$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^m \alpha_u \Delta Y_{t-i} + \varepsilon_t \quad (5)$$

$Y_t$  is a random walk with a drift:

$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \sum_{i=1}^m \alpha_u \Delta Y_{t-i} + \varepsilon_t \quad (6)$$

$Y_t$  is a random walk with a drift around a stochastic trend:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^m \alpha_u \Delta Y_{t-i} + \varepsilon_t \quad (7)$$

Where:  $Y$  represents a time series;  $t$  is a time trend;  $\Delta$  the first difference operator;  $\beta_1$  is a constant;  $m$  the optimal number of lags of  $Y$  determined including enough terms in order that the error term is serially uncorrelated;  $\varepsilon$  is a pure white noise error term; and  $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$ ,  $\Delta Y_{t-2} = (Y_{t-2} - Y_{t-3})$ . The ADF test refers to the t-statistics of the  $\delta$  coefficient. In each of the cases, the null hypothesis is that  $\delta=0$ , or that there is a unit root, the time series is not stationary against the alternative that  $\delta<0$ , the time series is stationary. If a time series  $Y_t$  is said to be integrated of order ( $d$ ),  $Y_t$  is  $I(d)$ , then  $Y_t$  must be differenced  $d$  times to eliminate its stochastic trend (Stock & Watson, 1989). In the case the time series is stationary in levels it is said to be  $I(0)$ .

### *Phillips-Perron (PP)*

In addition to the ADF test, Phillips (1987) and Phillips and Perron (1988) propose a non-parametric statistical test that generalizes the ADF procedure by relaxing some of the restrictive assumptions on the time series. PP test proposes to account for serial correlation in the error term without adding lagged difference terms. In the PP test, the estimation of the following equation is required (without trend in this case, but as in ADF all alternatives are available):

$$Y_t = \beta_t + \sum_{i=1}^T Y_{t-T} + \varepsilon_t \quad (8)$$

The Phillips – Perron test assumes the *presence of a unit root* in the null hypothesis and the stationarity of the variable in the alternative hypothesis. If the calculated statistics is lower than the McKinnon’s critical value, then we reject the null hypothesis ( $H_0$ ), so the considered variable is stationary and vice versa.

In our case, we will employ both unit root tests, ADF and PP tests, to guarantee that inferences related to stationarity are not driven by the choice of the testing procedure (Darrat, 1999).

### *Cointegration analysis*

Very frequently, empirical macroeconomics involves the use of non-stationary and/or trending variables. Thus, after exploring the integration order of the time series, in a second step, for those integrated of the same order, we investigate if they are cointegrated. As proposed by Engle and Granger (1987), if the time series share a common stochastic time trend, their multivariate representation will be cointegrated, thus regression analysis can reveal the presence of long run relationship among variables. In other words, if, in the long run the considered series move closely, the difference between the two is constant, thus stationary (Chimobi, 2010). If the series are found not to be cointegrated, they follow their own path, wandering arbitrarily away from each other (Dickey, Jansen and Thornton, 1991). Frequently, before testing empirically for cointegration between the variables (Johansen, 1988; Johansen and Juselius, 1990) judgments based on economic theory and graphical inspections proceed.

Given a general VAR of order (p) of non-stationary  $n$  variables:

$$Y_t = \mu_t + A_1 Y_{t-1} + \dots + A_p Y_{t-p} + \varepsilon_t \quad (9)$$

$$Y_t = \mu_t + \sum_{i=1}^p A_i Y_{t-i} + \varepsilon_t \quad (10)$$

where  $Y_t$  represents a  $(n \times 1)$  vector of endogenous variables;  $\mu$  a  $(n \times 1)$  vector of constants;  $A_i$   $(n \times n)$  represent the polynomial variance – covariance matrix to be estimated; and  $\varepsilon_t$   $(n \times 1)$  vector of exogenous shocks. If the variables involved in the analysis are found to be integrated of order 1, and a cointegration relationship exists among them, then the vector error correction (VECM) can be represented as:

$$\Delta Y_t = \mu + \Pi Y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta Y_{t-1} + \varepsilon_t \quad (11)$$

Where  $\Pi = \sum_{i=1}^p A_i - I$ ,  $\Gamma_i = -\sum_{j=i+1}^p A_j$  are matrixes of coefficients to be estimated,  $I$  ( $n \times n$ ) is the identity matrix, and  $\Delta Y_t$  ( $n \times 1$ ) denotes the vector of first differences.

The VECM presentation allows capturing information from both short-term and long-term adjustments to  $Y_t$  changes. The short term adjustments to changes in  $Y_t$  are captured form the  $\Gamma$  ( $n \times n$ ) vector. Meanwhile, the  $\Pi$  ( $n \times n$ ) matrix contains the long run coefficients (cointegrating vectors) and of the error correction term.

If there exists  $r$  such as  $0 < r < n$ , the  $\Pi$  matrix can be decomposed as:

$$\Pi = \alpha \beta' \quad (12)$$

$$(r \times r) = [(n \times r) (n \times r)']$$

$$\text{Rank} (\Pi) = \min [\text{Rank} (\alpha), \text{Rank} (\beta)]$$

The columns of  $\beta$  matrix contain the  $r$  linearly independent cointegrating vectors and the columns of  $\alpha$  matrix contain the  $r$  adjustment from disequilibrium vectors. Thus, testing for cointegration implies testing for the rank of the  $\Pi$  matrix ( $\Pi$ 's matrix eigenvalues significantly different from zero).

If the  $\Pi$  matrix has rank 0 ( $r=0$ ), then there is no cointegration between the variables (so we use the first difference VAR ( $p$ )).

If  $\Pi$  has full rank ( $r=n$ ), the variables cannot be  $I(1)$ , thus they are stationary  $I(0)$ .

Johansen (1988) and Johansen and Juselius (1990) propose the maximum likelihood (ML) test to check for the number of cointegrating vectors (or the rank of  $\Pi$  matrix), in a single step procedure. For this purpose they propose two tests: the maximum eigenvalue test and the trace statistics test.

In the case of the maximum eigenvalue test, the likelihood ratio test statistic for the null hypothesis of (r) cointegrating vectors against the alternative of (r+1) cointegrated vectors is given by:

$$\lambda_{max}(r, r + 1) = -T \ln(1 - \hat{\lambda}_{r+1}) \quad (13)$$

Since the null hypothesis of r=0 is tested against the alternative hypothesis of r=1, the null of r=1 is tested against the alternative of r=2 and so on.

In the case of the he trace test, the likelihood ratio test statistic for the null hypothesis that there are at most (r) cointegrating vectors against the alternative that there is more than (r) cointegrated vectors and is computed as:

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^n \log(1 - \hat{\lambda}_i) \quad (14)$$

Where  $\hat{\lambda}_{r+1} \dots \hat{\lambda}_n$  represent  $i^{th}$  ordered eigenvalue from the  $\Pi$  matrix.

The cointegration tests are very sensitive to the lag length selection. In order to choose the appropriate lag we will employ the common information criteria<sup>2</sup> combined with general-to-specific approach. Having obtained the optimal lag length from one of these information criteria, checks for autocorrelation, normality and heteroscedasticity are undertaken to make sure that the errors are white noise. In case they are not, we either reduce or increase the lag length while checking for the same tests.

### *Granger causality tests*

The Granger causality procedure has become quite common in studies testing for the direction of causality in the finance and growth nexus in single country studies. Due to its simplicity, it has gained a lot of popularity among researches since, especially in the case of short time series allows for more degrees of freedom. Granger causality tests should be performed under

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<sup>2</sup> Some of the information criteria are: Akaike Information Criterion (AIC), Sequential Modified LR test statistic (LR), final prediction error (FPE), Schwarz Information Criterion (SC) and Hannan-Quinn Information Criterion (HQ).

stationary time series in order to avoid the phenomena of “spurious regressions” as discussed by Granger and Newbold (1974) and Phillips (1986). Stock and Watson (1989) also showed that if non stationary variables are included in models, the common tests statistics (such as Durbin Watson, F-statistic, t-test etc.) will not have standard distributions. Sorensen (2005) suggests that the causality should not be interpreted in the deep sense of the word. It should be interpreted in terms of a linear prediction, it measures whether one thing happens before the other and helps predict it, *cause predicts effects* (Lin, 2008). When making causality test there are two main assumptions underlying: (i) the future cannot cause the past, the past cause the present and future. In other words, it concerns a precedence in time and information provided by X in explaining current values of Y (Boulila and Trabelsi, 2002) (ii) a cause contains unique information about an effect not available elsewhere (Lin, 2008). Granger (1969) proposed the Granger-causality test to explore the casual relationships between two variables.

In simple words, Granger’s approach to whether  $X_t$  causes  $Y_t$  involves exploring how much of the current value of  $Y_t$  can be explained by past values of  $Y_t$  and then, the introduction of lagged values of  $X_t$  can improve the explanation of  $Y_t$ . Assuming that  $X_t$  and  $Y_t$  are two stationary time series, a causal model can be written in matrix form as:

$$\begin{bmatrix} Y_t \\ X_t \end{bmatrix} = \begin{bmatrix} c_1 \\ c_2 \end{bmatrix} + \begin{bmatrix} \alpha_{11}^1 & \alpha_{12}^1 \\ \alpha_{21}^1 & \alpha_{22}^1 \end{bmatrix} \begin{bmatrix} Y_{t-1} \\ X_{t-1} \end{bmatrix} + \dots + \begin{bmatrix} \alpha_{11}^k & \alpha_{12}^k \\ \alpha_{21}^k & \alpha_{22}^k \end{bmatrix} \begin{bmatrix} Y_{t-k} \\ X_{t-k} \end{bmatrix} \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \end{bmatrix} \quad (15)$$

$$Y_t = c_1 + \sum_{i=1}^k \alpha_{11}^i Y_{t-i} + \sum_{i=1}^k \alpha_{12}^i X_{t-i} + \varepsilon_{1t} \quad (16)$$

$$X_t = c_2 + \sum_{i=1}^k \alpha_{21}^i X_{t-i} + \sum_{i=1}^k \alpha_{22}^i Y_{t-i} + \varepsilon_{2t} \quad (17)$$

under the assumption that the disturbances  $\varepsilon_{1t}$  and  $\varepsilon_{2t}$  are not correlated and are white noise series, and  $i$  is a finite length of the available data;  $\alpha$  are the coefficients to be estimated;  $c_1$  and  $c_2$  are the constants. Checking the causality between  $X_t$  and  $Y_t$  implies checking for the significance of  $\alpha_{12}$  and  $\alpha_{22}$  coefficients. The definition of causality implies that  $Y_t$  is Granger causing  $X_t$ , provided that some of the coefficients on the lagged values  $Y_t$  ( $\alpha_{22}$ ) are nonzero. In

the same way,  $X_t$  is Granger causing  $Y_t$ , if some of the coefficients on the lagged values of  $X_t(\alpha_{12})$  are not zero. In the case that both,  $\alpha_{22}$  and  $\alpha_{12}$  are non-zero, it can be said that no  $X_t$  and  $Y_t$  present a feedback relationship (two way causality).

In the case of financial development and economic growth we can re-write equations (16) and (17) as:

$$EG_t = c_1 + \sum_{i=1}^k \alpha_{11}^i FD_{t-i} + \sum_{i=1}^k \alpha_{12}^i EG_{t-i} + \varepsilon_{1t} \quad (18)$$

$$FD_t = c_2 + \sum_{i=1}^k \alpha_{21}^i FD_{t-i} + \sum_{i=1}^k \alpha_{22}^i EG_{t-i} + \varepsilon_{2t} \quad (19)$$

Where  $\varepsilon_{1t}$  and  $\varepsilon_{2t}$  are uncorrelated, FD stands for financial development indicator and EG for economic growth indicator. We will test for the null hypothesis, according to which there is no Granger causality:

- If  $\sum_{i=1}^k \alpha_{11}^i \neq 0$  and  $\sum_{i=1}^k \alpha_{22}^i = 0$ , there is a unidirectional causality running from FD→EG.
- If  $\sum_{i=1}^k \alpha_{22}^i \neq 0$  and  $\sum_{i=1}^k \alpha_{11}^i = 0$ , there is a unidirectional causality running from EG→FD.
- If  $\sum_{i=1}^k \alpha_{11}^i \neq 0$  and  $\sum_{i=1}^k \alpha_{22}^i \neq 0$ , there is a bidirectional causality, EG↔FD.
- If  $\sum_{i=1}^k \alpha_{11}^i = 0$  and  $\sum_{i=1}^k \alpha_{22}^i = 0$ , EG and FD are independent.

Granger causality test employs the F-test statistic to test the hypothesis. If the computed F-value exceeds the critical F-value (for a certain level of confidence), the null hypothesis is rejected. For example, if the null states that “FD doesn’t cause GDP”, we reject the null in case the F-computed is higher than the critical F-value, therefore, we can conclude that FD causes GDP.

In case of non-stationary variables, say I (1) and in presence of cointegration, Granger causality tests should be performed on a VECM representation:

$$\Delta EG_t = c_1 + \sum_{i=1}^k \alpha_{11}^i \Delta FD_{t-i} + \sum_{i=1}^k \alpha_{12}^i \Delta EG_{t-i} + \delta EC_{1t-i} + \varepsilon_{1t-i} \quad (20)$$

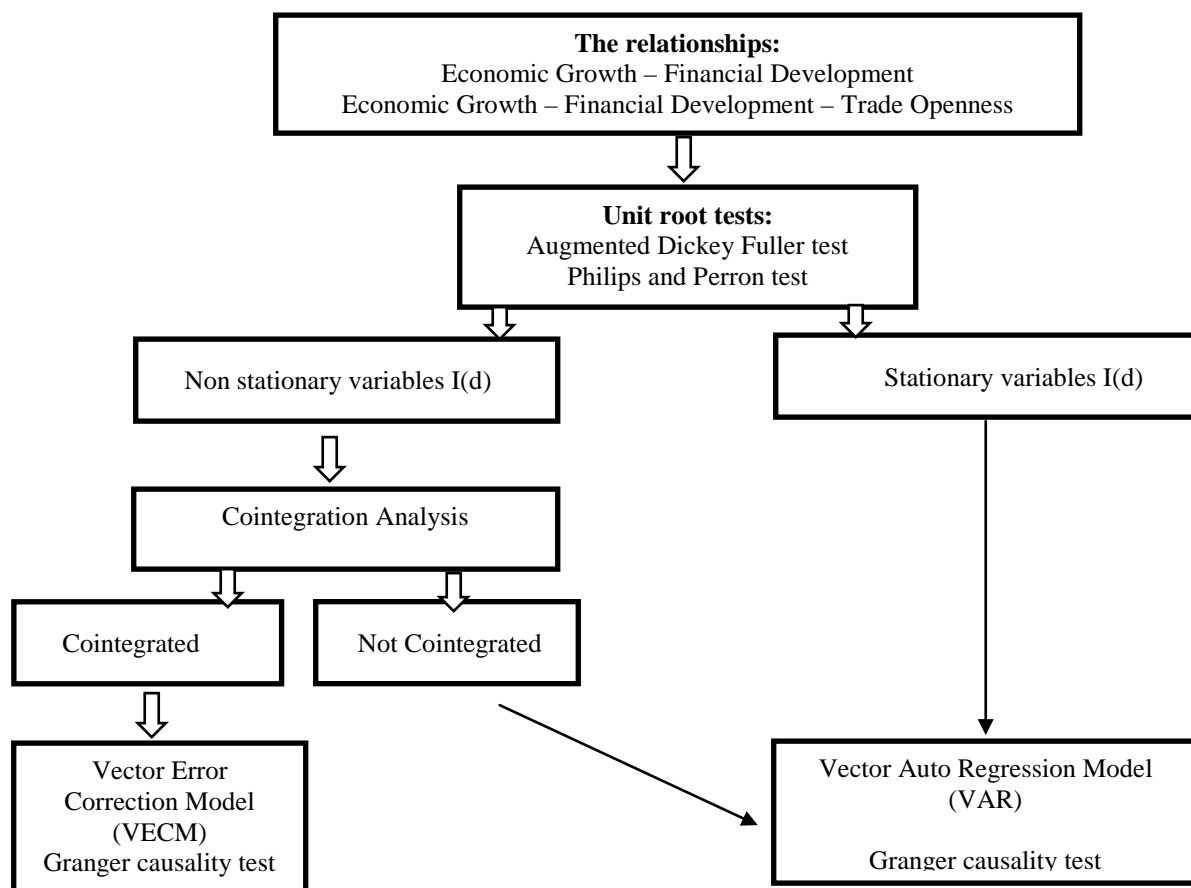


$$\Delta FD_t = c_2 + \sum_{i=1}^k \alpha_{21}^i \Delta FD_{t-i} + \sum_{i=1}^k \alpha_{22}^i \Delta EG_{t-i} + \delta EC_{2t-i} + \varepsilon_{2t-i} \quad (21)$$

where  $EC_{1t-i}$  and  $EC_{2t-i}$  represent the error correction terms. The error correction term should assume a negative sign, and its statistical significance indicates a long run relationship between FD and EG.

The modeling strategy can be summarized as in the following picture:

Figure 4. The way to causality.



The variables that are found to be non-stationary and not cointegrated, a simple VAR (after having differenced the time series in order to become stationary) will be estimated in order to assess causality. The VAR representation can be written as follows:

Bivariate case: financial development and economic growth:

$$\Delta EG_t = c_1 + \alpha_{11}^1 \Delta FD_{t-1} + \alpha_{12}^1 \Delta FD_{t-2} + \dots + \alpha_{1(p-1)}^1 \Delta FD_{t-(p-1)} + \alpha_{11}^2 \Delta EG_{t-1} + \alpha_{12}^2 \Delta EG_{t-2} + \dots + \alpha_{1(p-1)}^2 \Delta EG_{t-(p-1)} + \varepsilon_{1t} \quad (22)$$

$$\Delta FD_t = c_2 + \alpha_{21}^1 \Delta FD_{t-1} + \alpha_{22}^1 \Delta FD_{t-2} + \dots + \alpha_{2(p-1)}^1 \Delta FD_{t-(p-1)} + \alpha_{21}^2 \Delta EG_{t-1} + \alpha_{22}^2 \Delta EG_{t-2} + \dots + \alpha_{2(p-1)}^2 \Delta EG_{t-(p-1)} + \varepsilon_{2t} \quad (23)$$

where  $p$  represents the VAR order,  $c$  is the constant term and  $\varepsilon$  are the uncorrelated residuals of the model.

Trivariate case: financial development, economic growth and trade openness:

$$\Delta EG_t = c_1 + \alpha_{11}^1 \Delta FD_{t-1} + \alpha_{12}^1 \Delta FD_{t-2} + \dots + \alpha_{1(p-1)}^1 \Delta FD_{t-(p-1)} + \alpha_{11}^2 \Delta EG_{t-1} + \alpha_{12}^2 \Delta EG_{t-2} + \dots + \alpha_{1(p-1)}^2 \Delta EG_{t-(p-1)} + \alpha_{11}^3 \Delta TO_{t-1} + \alpha_{12}^3 \Delta TO_{t-2} + \dots + \alpha_{1(p-1)}^3 \Delta TO_{t-(p-1)} + \varepsilon_{1t} \quad (23)$$

$$\Delta FD_t = c_2 + \alpha_{21}^1 \Delta FD_{t-1} + \alpha_{22}^1 \Delta FD_{t-2} + \dots + \alpha_{2(p-1)}^1 \Delta FD_{t-(p-1)} + \alpha_{21}^2 \Delta EG_{t-1} + \alpha_{22}^2 \Delta EG_{t-2} + \dots + \alpha_{2(p-1)}^2 \Delta EG_{t-(p-1)} + \alpha_{21}^3 \Delta TO_{t-1} + \alpha_{22}^3 \Delta TO_{t-2} + \dots + \alpha_{2(p-1)}^3 \Delta TO_{t-(p-1)} + \varepsilon_{2t} \quad (24)$$

$$\Delta TO_t = c_3 + \alpha_{31}^1 \Delta FD_{t-1} + \alpha_{32}^1 \Delta FD_{t-2} + \dots + \alpha_{3(p-1)}^1 \Delta FD_{t-(p-1)} + \alpha_{31}^2 \Delta EG_{t-1} + \alpha_{32}^2 \Delta EG_{t-2} + \dots + \alpha_{3(p-1)}^2 \Delta EG_{t-(p-1)} + \alpha_{31}^3 \Delta TO_{t-1} + \alpha_{32}^3 \Delta TO_{t-2} + \dots + \alpha_{3(p-1)}^3 \Delta TO_{t-(p-1)} + \varepsilon_{3t} \quad (25)$$

In case, variables are found to be non-stationary integrated of order (1), and cointegrated a VECM will be estimated to assess for Granger causality. Thus, the above equations should be written as:

Bivariate case: financial development and economic growth:

$$\Delta EG_t = a_1 + \beta_{11}^1 \Delta FD_{t-1} + \beta_{12}^1 \Delta FD_{t-2} + \dots + \beta_{1(p-1)}^1 \Delta FD_{t-(p-1)} + \beta_{11}^2 \Delta EG_{t-1} + \beta_{12}^2 \Delta EG_{t-2} + \dots + \beta_{1(p-1)}^2 \Delta EG_{t-(p-1)} + \delta_1 EC_{t-1} + \varepsilon_{1t} \quad (26)$$

$$\Delta FD_t = a_2 + \beta_{21}^1 \Delta FD_{t-1} + \beta_{22}^1 \Delta FD_{t-2} + \dots + \beta_{2(p-1)}^1 \Delta FD_{t-(p-1)} + \beta_{21}^2 \Delta EG_{t-1} + \beta_{22}^2 \Delta EG_{t-2} + \dots + \beta_{2(p-1)}^2 \Delta EG_{t-(p-1)} + \delta_2 EC_{t-1} + \varepsilon_{2t} \quad (27)$$

Trivariate case: financial development, economic growth and trade openness:

$$\begin{aligned}\Delta EG_t = & a_1 + \beta_{11}^1 \Delta FD_{t-1} + \beta_{12}^1 \Delta FD_{t-2} + \dots + \beta_{1(p-1)}^1 \Delta FD_{t-(p-1)} + \beta_{11}^2 \Delta EG_{t-1} + \beta_{12}^2 \Delta EG_{t-2} \\ & + \dots + \beta_{1(p-1)}^2 \Delta EG_{t-(p-1)} + \beta_{11}^3 \Delta TO_{t-1} + \beta_{12}^3 \Delta TO_{t-2} + \dots + \beta_{1(p-1)}^3 \Delta TO_{t-(p-1)} \\ & + \delta_1 EC_{t-1} + \varepsilon_{1t} \quad (28)\end{aligned}$$

$$\begin{aligned}\Delta FD_t = & a_2 + \beta_{21}^1 \Delta FD_{t-1} + \beta_{22}^1 \Delta FD_{t-2} + \dots + \beta_{2(p-1)}^1 \Delta FD_{t-(p-1)} + \beta_{21}^2 \Delta EG_{t-1} + \beta_{22}^2 \Delta EG_{t-2} \\ & + \dots + \beta_{2(p-1)}^2 \Delta EG_{t-(p-1)} + \beta_{21}^3 \Delta TO_{t-1} + \beta_{22}^3 \Delta TO_{t-2} + \dots + \beta_{2(p-1)}^3 \Delta TO_{t-(p-1)} \\ & + \delta_2 EC_{t-1} + \varepsilon_{2t} \quad (29)\end{aligned}$$

$$\begin{aligned}\Delta TO_t = & a_3 + \beta_{31}^1 \Delta FD_{t-1} + \beta_{32}^1 \Delta FD_{t-2} + \dots + \beta_{3(p-1)}^1 \Delta FD_{t-(p-1)} + \beta_{31}^2 \Delta EG_{t-1} + \beta_{32}^2 \Delta EG_{t-2} \\ & + \dots + \beta_{3(p-1)}^2 \Delta EG_{t-(p-1)} + \beta_{31}^3 \Delta TO_{t-1} + \beta_{32}^3 \Delta TO_{t-2} + \dots + \beta_{3(p-1)}^3 \Delta TO_{t-(p-1)} \\ & + \delta_3 EC_{t-1} + \varepsilon_{3t} \quad (30)\end{aligned}$$

Where EC is the error correction term;  $\delta$  is the short run coefficient of the error correction term ( $-1 < \delta < 0$ );  $p$  is the VAR order translated to  $p-1$  in the VECM; and  $\beta \neq 0$  before the lagged values captures the short term dynamics of the model.

In summary, according to Granger (1988), Kamat and Kamat (2007), Lin (2008) and Darrat (2009), causality between the variables can run through two channels: through the lagged variables (when their coefficients are statistically significant), which indicates also the short run causality; and second, through the error correction term for the long run causality. If all the explanatory variables including the error correction term (in the case of VECM) turn out to be non-significant, we can argue in favor of strong exogeneity of the dependent variables, thus absence of Granger causality.

### III.2 The data

Data availability was the main constraint of this study, because time series on macroeconomic variables are too short as in many developed countries. We will assess the stated hypothesis in introductory section of this thesis considering a sub sample from 1998Q1 to 2008Q3 and full sample from 1998Q1 to 2013Q2. Also, some data prior 1998 are available, but we do not consider them in this study since they are subject to frequent methodological measurement changes. Also, given the transitional process from an isolated to an open market economy the period before 1998 was characterized by huge structural breaks and shocks such as

the 1997 financial crisis. After 1998 some stabilization in the economy occurred. Since financial intermediation is performed prevalently from the banking system we do not have indicators related to the stock market. All the monetary data used as proxies for financial intermediation comprise the data from deposit money banks and from the Unions of Savings and Loans Associations operating in Albania. All variables enter the empirical estimation in natural logarithm and not seasonally adjusted.

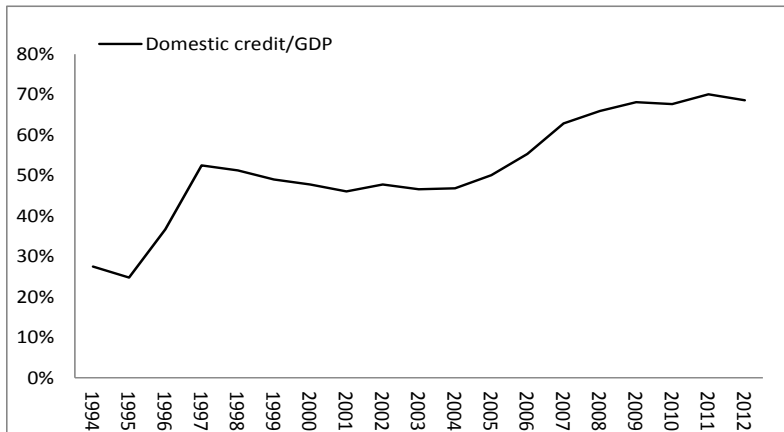
### III.2.1 Proxy measures for financial development (FD):

Financial development has been broadly defined as the qualitative, quantitative, and efficient improvement of services provided by financial intermediaries. The entire process involves numerous activities and institutions. The choice of the proxies for financial development depends on the availability of data at the period during which this study is done. There is not a unique best indicator of financial development. The inclusion of a large set of financial development proxies allows maximizing the information on financial development, as different aggregates can catch different aspects of the financial sector. Also, using a broad set of indicators helps in checking the robustness of the results (Lee, 2005). We will use only bank-based measures of financial development since stock market data are absent in Albania (it exists *de jure*, but *de facto* no companies are quoted). The source of data for monetary and banking indicators is the Bank of Albania. In the fourth quarter of 2006, the monetary data have been subject to methodological changes. To overcome this problem, the data prior to 2006 is obtained by applying the old growth rates to the new time series starting from 2006. The same methodological changes concern deposits time series as well. In December 2002, a new methodology was introduced. The same procedure was applied also to the total deposits time series. All financial development indicators are expressed in terms of nominal GDP. The latter is released by the National Institute of Statistics (INSTAT) in Albania and is available in annual terms in Albania till 2011. The quarterly interpolation was realized using real GDP quarterly weights for the period 2005-2011 and using quadratic match sum interpolation method for the period 1998- 2004. The figures for nominal GDP for 2012 and 2013 are obtained by applying to the last quarter of 2011 the real growth rates plus the inflation rate as released by INSTAT.

*FDI represented by the ratio of domestic credit to nominal GDP.*

In most of literature, domestic credit to nominal GDP represents one of the classical indicators used to proxy financial development. Roughly, it indicates how much of the accumulated resources from the banking system is being channeled to the real economy. High values of this indicator may also signal the degree of dependence on the banking system for financial resources Hassan, Sanchez and Yu (2011). In many transition and developing economies, beside credit to the private sector, this indicator comprises even credit granted to the central government and state enterprises too. This represents one of the main weaknesses of such ratio. Also, it does not reflect whether the financial system is well performing in mobilizing savings, allocating financial resources, diversifying risks etc.

Chart 3. Domestic credit to GDP



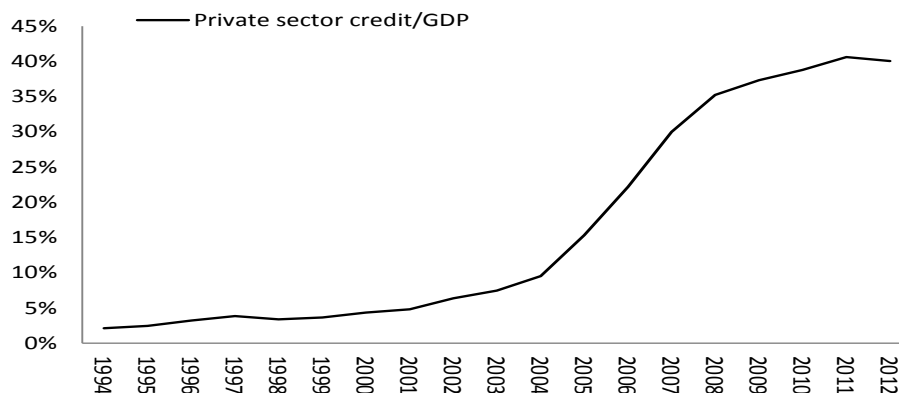
Source: Bank of Albania, INSTAT

That is exactly the case of Albania, where during the first years of transition, domestic credit was mainly driven by the need of the public sector to sustain public finances. The private sector backwardness also contributes to the same direction. In 1994, about 88.8% of total domestic credit was granted to the central government. Partly, funds were also channeled to state owned enterprises. From this period, the relative weight of public funding on total domestic credit marked a progressive decline, with partial contribution of the ongoing privatization process in Albania. The prevalence of the public sector on total domestic credit prevailed until 2008, and then a reverse trend can be observed. From 2008, data show a contraction in the proportion of credit granted to the government in favor of the private sector of the economy. In the last four years, domestic credit amounted to 68.8% of nominal GDP.

*FD2 represented by the ratio of private sector credit to nominal GDP.*

Often in the literature, the domestic credit ratio to GDP has not been considered a good indicator of financial development since funneling government financing does not mean a more efficient allocation of financial resources. Thus, we construct another proxy for financial development, which is the ratio of private credit to nominal GDP. This indicator better indicates the amount of financial resources granted to the private sector and can be seen as a measure of allocative efficiency of the banking system. It can represent a good direct indicator of financial intermediation and financial development especially in developing countries (Odedokun, 1989; De Gregorio and Guidotti, 1995; Kar and Pentecost, 2000; Boulila and Trabelisi, 2002; Ndlovu, 2013). Theoretically, the higher the amount of funds granted to the private sector is, the higher the investment and productivity rate is. According to Levine (2005) those financial systems allocating more credit to the private sector are more prone to search ex-ante for valid investment projects, to monitor investments and exert corporate governance following credit concession, ameliorate risk diversification and management, mobilizing and pooling savings.

Chart 4. Private sector credit to GDP



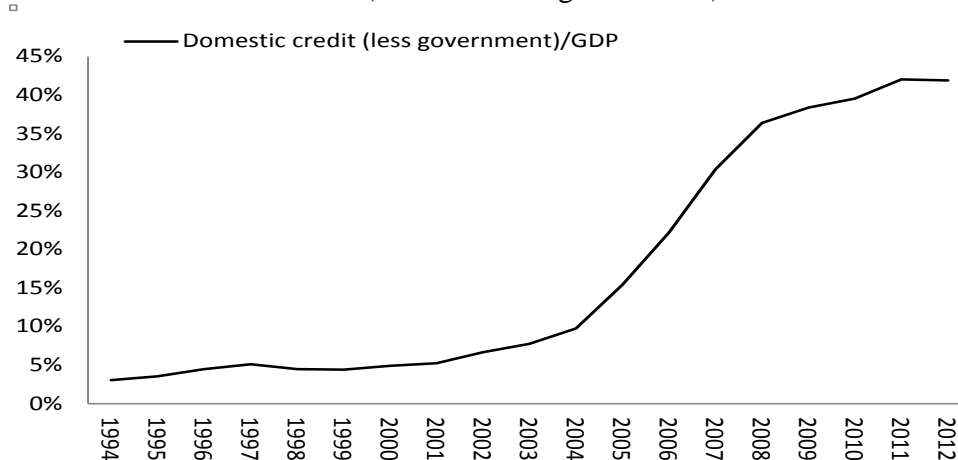
Source: Bank of Albania

During the first decade of transition towards an open market economy and in presence of a weak private sector, credit to the private sector represented on average only about 4.7% on nominal GDP. The sluggish growth of this indicator may be also attributed to the intervention of the government in the credit market (credit ceilings and credit rationing) and the peculiarities of the banking system at the time (dominated by state banks). An upward

trend on private credit as a ratio of GDP can be noticed from 2004. Driven from a higher private sector demand, credit to the private sector in terms of nominal GDP increased progressively at an accelerated rate recording about 40.0% in terms of nominal GDP in 2012.

*FD3 represented from the ratio of domestic credit (less government credit) on nominal GDP.* Since the first years of transition, Albania witnessed a progressive privatization process, which is not yet completely concluded till nowadays. State owned enterprises absorbed great amounts of financial resources. We construct another financial development indicator by subtracting government credit from domestic credit. The ratio of domestic credit (less government) to nominal GDP follows almost the same path as the ratio of private sector credit to GDP.

Chart 5. Domestic credit (excl. credit to government) on GDP



Source: Bank of Albania

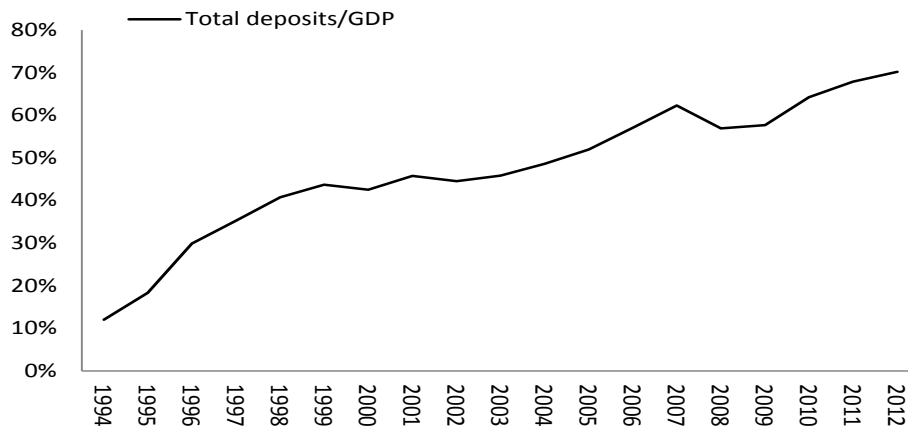
With the privatization process ongoing, the credit directed for state enterprises declined progressively until 2007, when a sudden jump was registered. From 2007 credit to public enterprises rose progressively reaching 2.7% of domestic credit in 2012 (one of the highest values since the beginning of the transition process).

*FD4 represents the ratio of total deposits on nominal GDP*

The ratio of total deposits to nominal GDP has been broadly used as an indicator of financial development (Demetriades and Hussein, 1996; Luinitel and Khan 1999). This indicator represents one of the main functions exercised by the banking system, savings accumulation

function. Depositing activity in Albania witnessed an accelerated growth from 12.1% of nominal GDP in 1994 to 43.7% of GDP during 1999. Due to the confidence crisis of 2002 and consequent deposits withdrawal, a marked slowdown in total deposits growth rate could be noticed. Till 2007 total deposits increased steadily, representing about 62.3% of nominal GDP. The surge of the financial crisis interrupted the positive trend and deposit growth remained sluggish until 2012.

Chart 6. Total deposits to GDP



Source: Bank of Albania

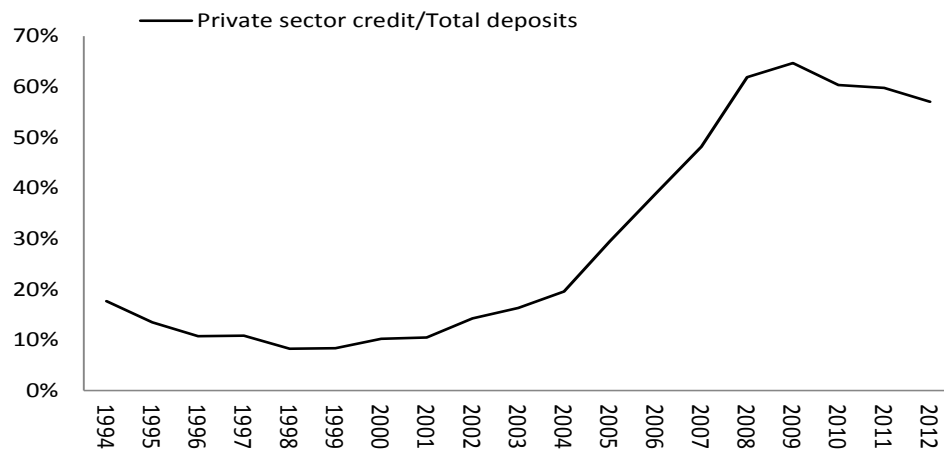
*FD5 represents the ratio of private sector credit to total deposits*

According to Hondroyiannis, Lolos and Papapetrou (2004) the ratio between credits to the private sector to total deposits may be considered as a measure of the ability of the banking system to provide finance-led growth, considered as a measure of allocation efficiency. It shows how much of the accumulated savings are channeled towards financing the real economy thus, affecting directly economic growth of the country.

Hitting the lowest levels in years 1998 – 1999, the ratio of private sector credit to total deposits witnessed a progressive behavior and continues to increase over time, signaling an improvement of banking intermediation from savers to borrowers. Regarding the other indicators aforementioned, the 2008 global financial crisis adversely (through lower deposits) affected this indicator. The financial intermediation as measured by the ratio of credit to private sector to total deposits slowed down its growth rates and represented about 57.0% in 2012.



Chart 7. Credit to private sector/total deposits

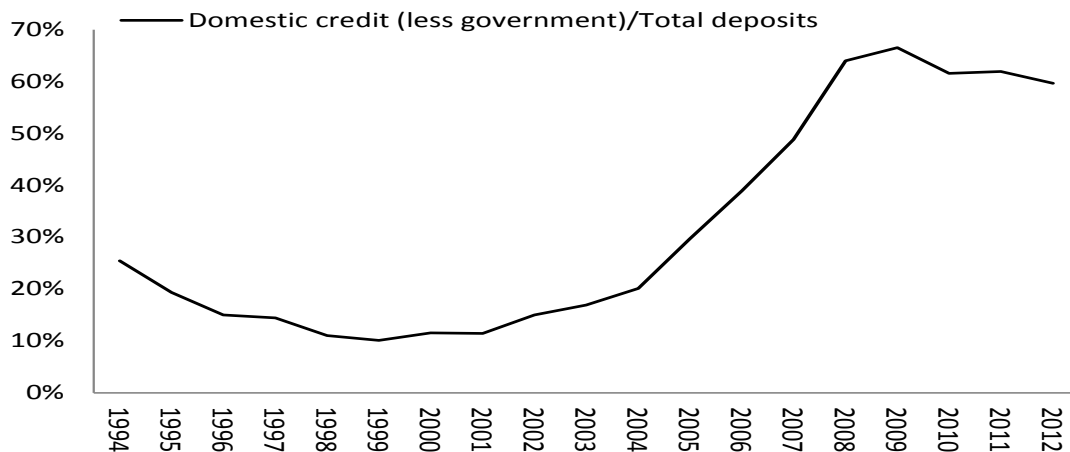


Source: Bank of Albania, INSTAT

*FD6 represents the ratio of domestic credit (less government) to total deposits*

Following the same reasoning as in FD3, we consider as an indicator of financial development the ratio of domestic credit (less government) to total deposits. Hereby we assume that even credit to state owned enterprises can be considered as a proxy of financial intermediation. By adding credit to state owned enterprises to the credit of private sector yields another proxy for financial development in Albania.

Chart 8. Domestic credit (excl. credit to government) on GDP



Source: Bank of Albania

Beside the private sector, state enterprises for a long time have been also absorbing financial resources. There is an open debate on the efficiency usage of these resources. What sounds

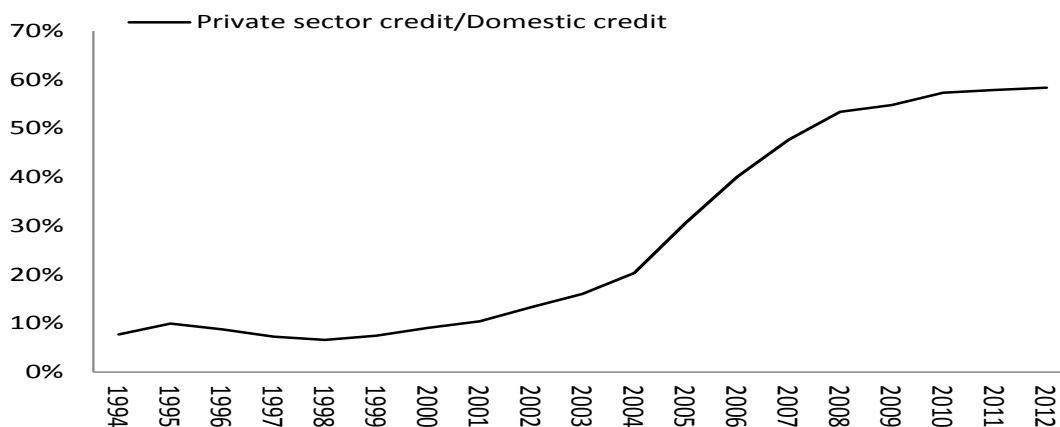
concerning is that those public companies not yet privatized have started absorbing financial resources. In 2012, domestic credit (less government) as a ratio of total deposits amounted on average (for the last three years) to about 61.1%

*FD 7 represents the ratio of credit to the private sector to domestic credit*

King and Levine (1993) and Rousseau and Wachtel (2011) in their empirical work consider that this indicator better allows assessing the size and quality of services provided by the financial system. The volume of credit channeled to the private sector as a ratio of domestic credit may also be used as a proxy to assess whether implemented reforms led to more efficient credit allocation or not. In this case, we assume that the private sector allocates resources more efficiently compared to the public sector. Likewise the ratio of credit private sector as a percentage of GDP, this one is in line with the inside money model of Shaw (1973), where both the ratios are responsible for the economic growth through investment quality and quantity. However, no information can be subtracted on the effectiveness of financial intermediaries in alleviating markets frictions and channeling funds to the best and most productive uses Levine, Loayza and Beck (2000).

After a substantial contraction during 1997 – 1998, the ratio of the private sector to domestic credit has been characterized by an upward trend over time, especially after 2005. Over the last three years, private sector credit amounted on average to about 58% of the domestic credit.

Chart 9. Credit to private sector/total deposits



Source: Bank of Albania

*FD8 represented by the narrow money aggregate (M1) to nominal GDP*

The ratio of the narrow money (M1) to nominal GDP may be used as a proxy for financial development of a country. According to De Gregorio and Guidotti (1995), the monetization ratio does not constitute a good indicator for financial development. They argue that a high level of monetization of the economy is more a result of the underdeveloped financial system. Lynch (1996) suggests that the narrow money to GDP better reflects money as a payment instrument. In the first stages of development, the narrow money indicator is expected to grow in line with economic transactions. As the financial market develops and more sophisticated financial instruments are introduced in the market, the ration of M1 to GDP is expected to decline.

Chart 10. Monetary aggregate M1 on GDP



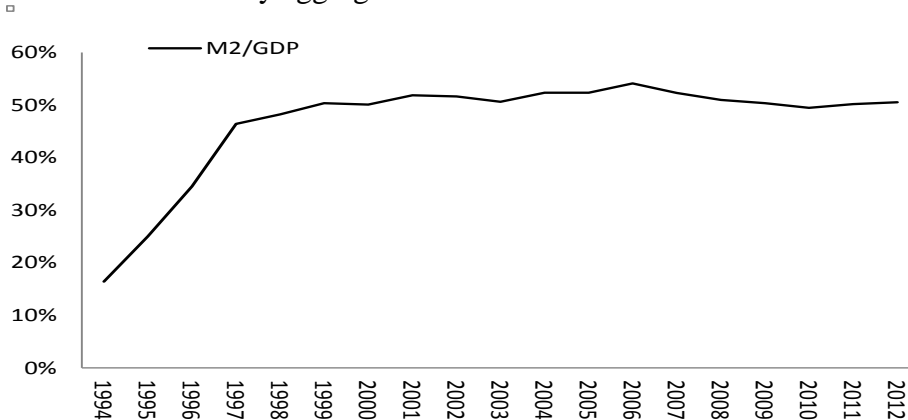
Source: Bank of Albania

In the Albanian case, the M1 monetary aggregate, defined as the most liquid one, encompasses the currency outside banks, demand deposits of non-bank residents except the government. As the 1997 crisis burst out, the M1/GDP indicator witnessed a jump to 25.3% in 1997 from 10.7% in 1994. After that, it never reached levels below 20% of GDP until 2012, despite some fluctuations over the years. The trend observed in this indicator may be guided by the yet high levels of currency outside banks.

*FD9 represented by the ratio of M2 to nominal GDP*

The ratio of M2 to GDP is one of the indicators commonly used to assess financial development. Dushku (2009) has also used this indicator to explore the finance and growth nexus. It measures the monetization degree of the economy, where money is broadly used as a payment and saving instrument. This is in line with the outside money model in McKinnon (1973) or with the intertemporal complementarity hypothesis, according to which investors must accumulate financial assets in advance in order to finance their investment projects later.

Chart 11. Monetary aggregate M2 on GDP



Source: Bank of Albania

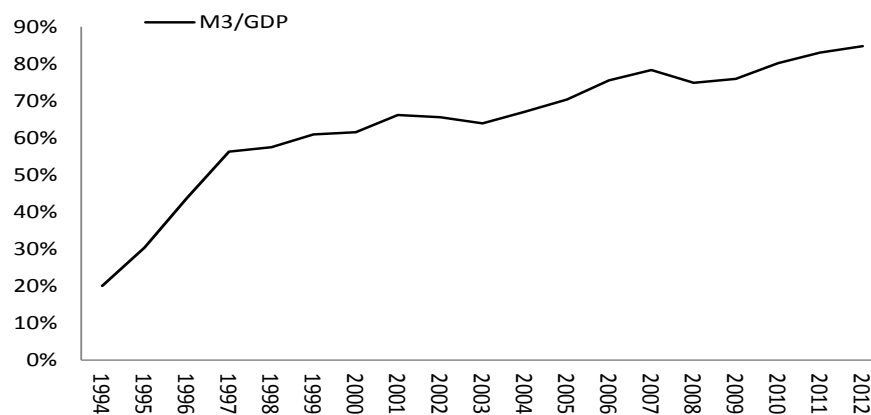
The M2 monetary aggregate is equal to M1 (currency outside banks + demand deposits) plus time deposits of non-bank residents, excluding the government. The M2/GDP ratio accounted for about 20% of nominal GDP in 1994 and marked a progressive increase to approximately 46.5% during 1997. The period from 1994 to 2000 registered an almost invariant ratio of M2/GDP given the economic and political situation in the country. After that, the monetization ratio stabilized around 50% of nominal GDP, with slight changes from year to year. A higher ratio of M2 to nominal GDP implies a larger financial sector thus greater financial development.

*FD10 represented by the broad money aggregate (M3) to nominal GDP*

A standard measure of financial depth in the literature is the ratio of M3 to nominal GDP (Rousseau and Wachtel, 2011). Khan and Senhadji (2000) argue that the M3/GDP may be a more appropriate as a proxy for financial development than M1/GDP and M2/GDP,

especially in economies with less developed financial systems. The rationale is that M1 and M2 reflect more the transactional side of the financial system rather than the allocative ability of the financial system to conduit funds from savers to borrowers. As stated above, narrow money should increase in presence of higher transactions, but if financial deepening is occurring, the broad money indicator should rise at a higher pace (Lynch, 1996).

Chart 12. Monetary aggregate M3 to GDP



Source: Bank of Albania, INSTAT

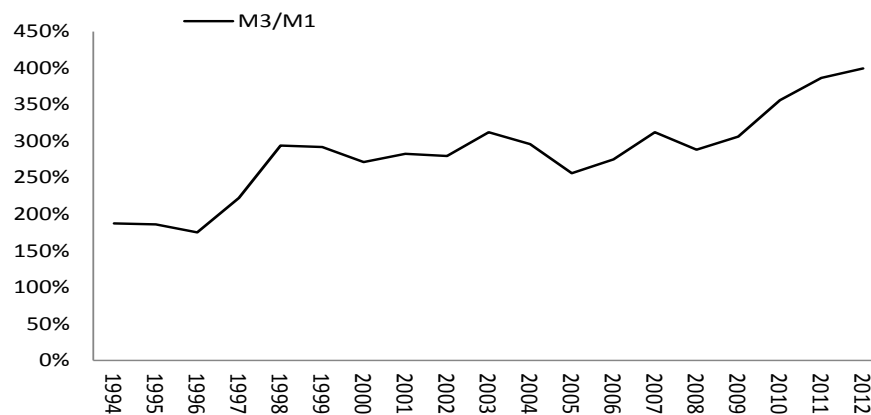
In the case of Albania, the broad money indicator includes M2 plus foreign currency denominated deposits of non-bank residents, except the government. Foreign currency denominated deposits account for a large part of total deposits in the banking system, and therefore it may be important to consider this indicator. M3/GDP indicator followed an accelerated increase over time stabilizing around the average level of 80% in terms of GDP in the last three years.

*FD11 represented by the ratio of broad money aggregate to narrow money aggregate (M3/M1)*

The ratio of the M3/M1 is used as a proxy for financial development in order to capture the resource pooling of the financial intermediaries in Albania. It indicates the ability of the financial system to attract deposits (both time and foreign currency deposits) assuring a pool of resources which potentially inject into the real economy. The M3/M1 ratio should be positively correlated with the countries level of financial development. A higher rate of

M3/M1 indicates for a more rapid increase of deposits versus transactions as the financial sector expands (Lynch. 1996)

Chart 13. Ratio of M3 to M1



Source: Bank of Albania, INSTAT

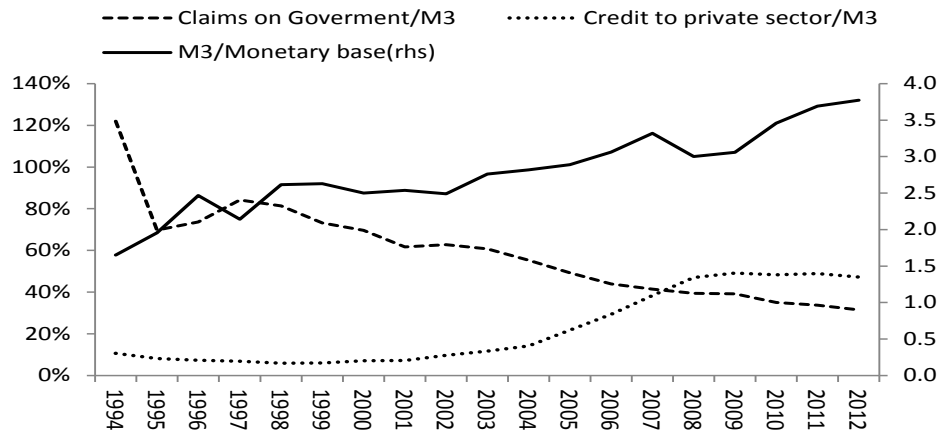
As Chart.13 shows, the M3/M1 ratio presents an upward positive trend with slight fluctuations over time. It reflects i a continuous improvement in the ability of banks in accumulating funds from savers.

*FD12 is represented by the broad money aggregate (M3) to the monetary base*

The ratio of M3 to the monetary base (composed by currency outside banks, required reserves and excessive reserves), defined as the money multiplier, represents an indicator of the financial intermediation. If the money multiplier takes a low value, as it is mostly common in transition and developing countries, it indicates a low intermediation of savings from the banking system. Suljoti (2003) argues that this is an inappropriate indicator of financial development in the case of Albania due to some issues. Since private sector credit to the economy represents a critical point to economic growth, the money multiplier cannot be a good proxy of financial development in case credit to central government is at considerable levels. This is the case of Albania, where Treasury bond investments constituted one of the main investment tools used by the banking system in the first years of transition. Also, the money multiplier is a proxy based only on domestic intermediation since it does not comprise the international financial intermediation of funds. The internal credit can be backed both by domestic deposits and foreign lending (especially bank lending). In the first

years of transition, international financing has represented an important source of funds for the private sector in Albania.

Chart 14. Credit by institutional sectors



Source: Bank of Albania

The improvement of the economic performance of the country over years brought changes into the investment policy applied by the banking system. Higher amounts of funds were channeled to the private sector of the economy fueling economic growth in the country. Since 1994, the gap between credit to government and private credit as a ratio of M3 became narrower. From 2008, credit to private sector represents the main investment tool used by the banking system. At the same time, credit to government remains relatively high, about 31.5% in 2012. Overall, having in mind the main weaknesses of this indicator and considering the reduced importance of governmental credit in favor of the private sector credit, we will consider the money multiplier as an indicator of financial development.

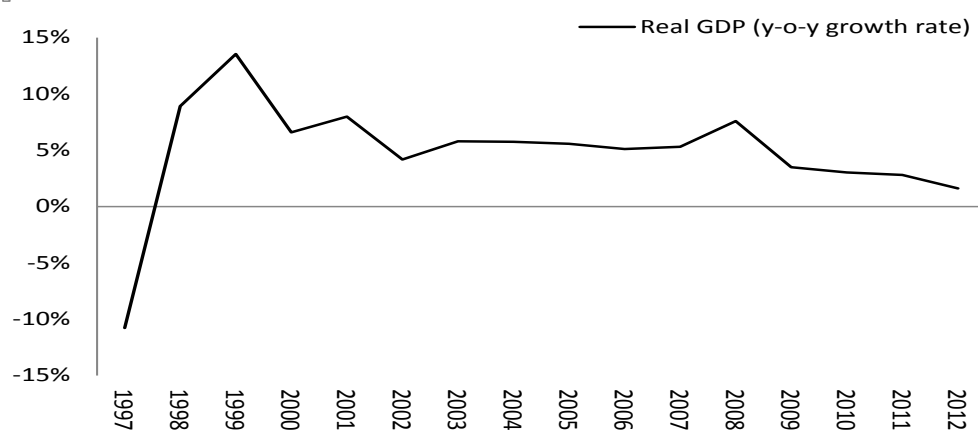
*FD 13 represented by the interest rate spread (weighted average for all maturities)*

The interest rate spread, calculated as the difference between average interest rates on loans and average interest rates paid on deposits (for all maturities), may be an indicator of the intermediation efficiency since it comprises both channels of intermediation: accumulation of savings and their investment. When the interest rate spread is high, it acts as an obstacle to financial development since it discourages potential savers due to lower interest rates and discourages borrowers due to higher interest rates on loans. The later can be translated into a lower intermediating activity, lower investments and thus subdued economic growth rates.

### III.2.2 Economic growth measures

The literature suggests a broad set of indicators in order to approximate economic growth. Following King and Levine (1993 a, b) the real GDP growth rate may be considered as an indicator with high indicative power of the quality and quantity of economic growth. This indicator has been broadly used in the finance and growth nexus literature. A sound and stable macroeconomic situation constitutes a fertile ground for the overall financial system development. In our case, real GDP (not seasonally adjusted) will be used to approximate economic growth. Real GDP is expressed in national currency (Albanian Lek, ALL) and is released by the National Institute of Statistics (INSTAT). The real GDP quarterly time series released by INSTAT is available only from 2005<sup>3</sup>.

Chart 15. Real GDP developments.



Source: INSTAT

According to Meksi (2012) preliminary first estimates of quarterly real GDP, subject to quarterly revisions, makes the GDP time series not very reliable. In her study, she found that revisions were high in average terms when compared to 7 OECD countries, where in average revisions are almost zero. Thus, revised GDP figures are significantly different from the last released ones. Therefore, the short time series (from 2005 – 2013) and the revision process which the real GDP series is subject to, constitute the two main drawbacks of this indicator. Data on real GDP for the period from 1998Q1 to 2004Q4 were built using annual real GDP growth rates provided by

<sup>3</sup> We refer to the latest publication of real GDP, on December 4, 2013. <http://www.instat.gov.al/al/themes/Ilogarit%C3%AB-kombetare/publications/books/2013/rritja-ekonomike-tremujore.-tr-iii-2013.aspx> It is important to highlight the publication date, given the frequent changes that the times series of real GDP is subject to.



INSTAT, while the interpolation was done by applying the quarterly weights of nominal GDP. This represents another weak point concerning the quality of the real GDP series. Dushku (2009) in the case of Albania used as an indicator for economic growth the real GDP per capita (without specifying the quarterly interpolation method or quarterly transformation). Differently, we choose to apply directly the real GDP data, since data on population in Albania diverge largely, according to the source of publication.

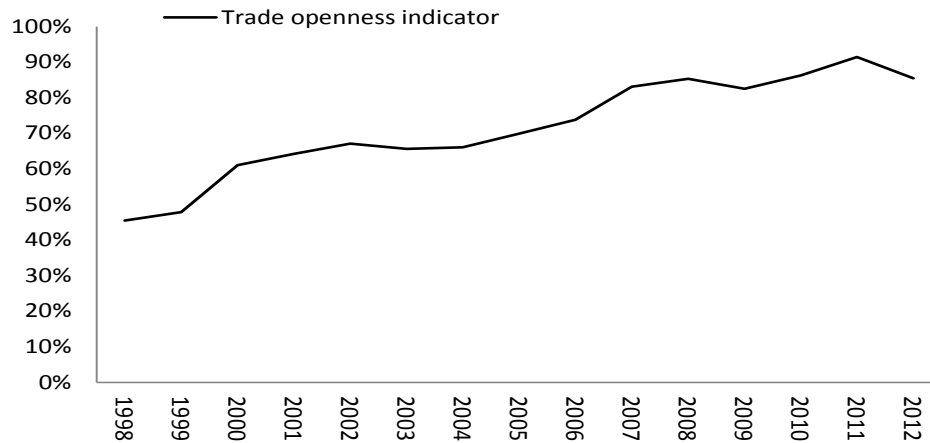
A quick overview of real GDP data shows a double digit yearly growth rate after the huge decline registered in 1997. Real GDP growth picked up very quickly stabilizing around an average growth rate of 6% before the global financial crisis. With the breakthrough of the financial crisis (2008 Q3), things changed and Albania faced a slowdown in real GDP growth. In average, the annual real growth rate slowed down to around 2.7% in the last four years.

### III.2.3 Proxy degree of openness of the economy

As it happens in many developing economies, Albania relies heavily on international trade to boost economic growth, in presence of a financial liberalization process (almost) concluded. Thus, trade openness can give a measure of the size of the real sector of the economy. In literature, different proxies have been used in order to approximate the degree of trade openness of the economy. Harrison (1995) makes use of a broad set of measures of trade openness: exports to GDP ratio, imports to GDP ratio, imports and exports to GDP ratio. Most of these measures show positive correlation with economic growth rates but, as Harrison (1996) states “trade flows are at best an imperfect proxy for trade policy”. Different proxies, obviously yield different results. In the case of Albania, we will refer to the classical definition of trade openness indicator:

$$\text{Trade openness (TO)} = \frac{ABS[\text{Imports (goods + services)}] + ABS[\text{Exports (goods + services)}]}{\text{Nominal GDP}}$$

Chart 16. Trade openness indicator



Source: Bank of Albania, INSTAT.

The source of data on imports and exports is the Balance of Payments, Bank of Albania. They are expressed in US dollars. Nominal GDP has been converted into US dollars using the quarterly average USD/ALL exchange rate from the Bank of Albania. Some effects of the exchange rate are carried on by converting the nominal GDP from ALL to USD currency. We expect the openness of the economy to have positive effects on economic growth. Somehow, this indicator represents the technology spillover effects of openness of the economy. As Grossman and Helpman (1992) suggest a higher degree of openness of the economy facilitates the access to technological information and innovation, which are both key elements to economic growth.

## V. EMPIRICAL RESULTS

### V.1 Unit root test results

The integration order of the 13 time series used in this study is explored using the Augmented Dickey Fuller test (ADF-test) and the Phillips - Perron test (PP-test). Both tests are used to check and to conclude on the stationary properties of the variables involved in the study in order to avoid any spurious regression results. Unit root tests, ADF test and PP test, are performed in the three specifications: with constant, with constant and trend, and none, in natural logarithm and levels (here we present only the results in natural logarithm form). Also, we will check the order of integration of the series over the whole sample (1998Q1 – 2013Q2) and over the shorter pre crisis sample (1998Q1 – 2013Q2).

In both test, the null hypothesis is that “*the variable has a unit root*”. If the calculated ADF test statistics and PP test statistics is higher than the critical value (CV) at the predetermined confidence interval (1%, 5%, 10%), we cannot reject the null hypothesis and conclude that the variable has a unit root. The ADF test applied over the whole sample, 1998Q1 – 2013Q2, shows that the variables (with exception of FD4 and FD13) are not stationary at levels when a constant is considered. When the ADF test is performed including a constant and trend, most of the variables (exception for FD4, FD6 and FD13) are not stationary. Since the ADF test in levels indicates the presence of unit roots, we consider the first difference of the time series and perform unit root ADF test considering a constant, a constant and trend and none. FD4, FD5 and FD13 are found to be non-stationary at levels when we do not account for trend or trend and intercept. To better explore their properties we proceed to graphical inspection and try different versions by shortening the time series. We test for the presence of unit roots of this series from 2000, removing data for the first two years after the 1997 financial crisis, since some structural breaks in the data may be present. We find that these variables are characterized by the presence of a unit root at levels.

Unit root tests are also performed in first differences. All the variables are found to be stationary after first differencing at 1%, 5%, and 10% confidence intervals. Judging on the ADF tests on all alternatives and from the graphical inspection; we conclude that all the variables are integrated of order one  $I(1)$ , at 1% and 5% confidence intervals.

Table 19. ADF unit root test results, 1998Q1 – 2013Q2

Full sample 1998Q1-2013Q2							
Variables	Augmented Dickey Fuller Test (ADF Test)						Final result
	Level: t-Statistic			First differences: t-Statistic			
	C	C+T	N	C	C+T	N	
LN(EG)	-2.748	-1.453	2.680	-3.540	-4.470	-2.153	I(1)
LN(TO)	-2.922	-0.984	-3.259	-8.072	-8.952	-4.620	I(1)
LN(FD1)	0.226	-2.162	-1.454	-7.514	-7.712	-7.268	I(1)
LN(FD2)	-1.030	-1.026	-1.026	-3.109	-3.150	-1.589	I(2)
LN(FD3)	-0.876	-1.371	-2.020	-2.731	-2.680	-1.543	I(2)
LN(FD4)	-4.298	-4.154	-0.466	-3.278	-3.276	-3.299	I(1)
LN(FD5)	-2.590	-2.599	-0.811	-3.809	-3.590	-3.751	I(1)
LN(FD6)	-0.468	-3.647	-3.761	-8.292	-8.214	-3.481	I(1)
LN(FD7)	-0.928	-2.653	-3.383	-7.049	-6.984	-6.284	I(1)
LN(FD8)	-1.136	-0.756	-2.152	-3.261	-3.292	-2.671	I(1)
LN(FD9)	-0.979	-1.679	-1.868	-3.049	-2.991	-2.587	I(1)
LN(FD10)	-1.861	-2.529	0.796	-8.151	-8.085	-8.129	I(1)
LN(FD11)	-1.280	-2.858	1.271	-8.175	-8.107	-8.010	I(1)
LN(FD12)	-2.597	0.217	-3.651	-2.974	-3.689	-1.705	I(1)
LN(FD13)	-5.030	-5.419	-0.517	-11.241	-11.142	-11.331	I(1)
<i>Mackinnon (1991) critical value for rejection of hypothesis of unit root applied: Test Critical Values</i>							
1% level	-3.542	-4.116	-2.603	-3.544	-4.118	-2.604	
5% level	-2.910	-3.485	-1.946	-2.911	-3.487	-1.946	
10% level	-2.593	-3.171	-1.613	-2.593	-3.172	-1.613	

In addition to the ADF-test, we also check for the integration order of the series by employing the Phillips-Perron unit root test. Time series in levels and in first-difference are considered including an intercept, an intercept and a trend, and none. Philips-Perron unit root test confirms the results obtained by the ADF-test.

Table 20. PP unit root test results, 1998Q1 – 2013Q2

Full sample 1998Q1-2013Q2							
Variables	Phillips-Perron Test Results						Final result
	Level: Adj. t-Stat			First differences: Adj. t-Stat			
	C	C+T	N	C	C+T	N	
LN(EG)	-2.716	-9.318	3.638	-39.659	-60.239	-16.881	I(1)
LN(TO)	-2.273	-4.105	-1.606	-14.508	-19.988	-12.026	I(1)
LN(FD1)	0.220	-2.162	-1.454	-7.524	-7.712	-7.268	I(1)
LN(FD2)	-0.588	-1.171	-3.222	-7.143	-7.102	-5.569	I(1)
LN(FD3)	-0.280	-1.705	-2.709	-6.415	-6.364	-5.042	I(1)
LN(FD4)	-2.530	-2.658	-0.128	-8.586	-8.542	-8.666	I(1)
LN(FD5)	-3.119	-3.347	-1.375	-10.719	-11.423	-10.353	I(1)
LN(FD6)	-0.495	-3.322	-3.724	-7.597	-7.512	-6.534	I(1)

LN(FD7)	-0.940	-2.974	-3.221	-7.049	-6.984	-6.260	I(1)
LN(FD8)	-0.575	-1.340	-2.339	-6.568	-6.527	-5.918	I(1)
LN(FD9)	-0.337	-1.959	-1.847	-6.047	-5.984	-5.413	I(1)
LN(FD10)	-1.862	-2.570	0.795	-8.138	-8.076	-8.120	I(1)
LN(FD11)	-1.280	-3.012	1.362	-8.189	-8.121	-8.008	I(1)
LN(FD12)	-1.028	-0.401	-3.540	-7.927	-7.987	-6.357	I(1)
LN(FD13)	-4.988	-5.405	-0.059	-18.537	-18.310	-18.345	I(1)
<i>Mackinnon (1991) critical value for rejection of hypothesis of unit root applied: Test Critical Values</i>							
1% level	-3.542	-4.116	-2.603	-3.544	-4.118	-2.604	
5% level	-2.910	-3.485	-1.946	-2.911	-3.487	-1.946	
10% level	-2.593	-3.171	-1.613	-2.593	-3.172	-1.613	

Overall, over the whole sample( 1998Q1 – 2013Q2), judgments based on graphical inspection and results of the ADF-test and PP-Test show that all the variables under consideration are not stationary at levels (1% and 5% confidence intervals). All variables become stationary in first differences, thus all variables are integrated of order one, say I(1).

Since a shorter sample, from 1998Q1 to 2008Q3, is employed to account for the global financial crisis effects on the growth - finance nexus and growth – finance – trade nexus, we need to examine the stationary properties over the reduced sample as well. Similar to the full sample, we employ graphical inspection, the ADF and the PP test to check for the integration order of all-time series considered.

Table 21. ADF unit root test results, 1998Q1 – 2008Q3

Pre-crisis sample 1998Q1-2008Q3							
Variables	Augmented Dickey Fuller Test (ADF Test) Results						
	Level: t-Statistic			First differences: t-Statistic			Final result
	C	C+T	None	C	C+T	None	
LN(EG)	-2.651	-3.780	12.468	-33.200	-35.000	-1.334	I(1)
LN(TO)	-1.883	-4.909	-3.292	-5.903	-5.980	-3.255	I(1)
LN(FD1)	0.879	-0.609	-1.087	-6.179	-7.419	-6.028	I(1)
LN(FD2)	2.236	-2.465	-1.974	-3.034	-7.674	-1.697	I(1)
LN(FD3)	2.861	-2.371	-1.682	-2.518	-7.283	-1.511	I(1)
LN(FD4)	-3.826	-3.826	0.021	-3.419	-6.605	-6.752	I(1)
LN(FD5)	-1.845	-2.230	-0.383	-3.113	-4.213	-3.201	I(1)
LN(FD6)	-0.537	-1.922	-3.345	-7.080	-6.978	-1.976	I(1)
LN(FD7)	-0.513	-1.979	-3.432	-6.594	-6.512	-5.425	I(1)
LN(FD8)	1.719	-3.242	-2.768	-5.942	-6.811	-2.076	I(1)
LN(FD9)	2.092	-3.103	-2.329	-5.317	-6.577	-1.967	I(1)
LN(FD10)	-2.042	-2.173	0.947	-6.544	-6.482	-6.512	I(1)
LN(FD11)	-0.441	-1.647	1.813	-7.091	-7.139	-6.694	I(1)
LN(FD12)	1.286	-3.036	-4.097	-7.304	-7.934	-1.255	I(1)

LN(FD13)	-4.380	-4.437	-0.504	-9.267	-9.148	-9.378	I(1)
<i>Mackinnon (1991) critical value for rejection of hypothesis of unit root applied: Test Critical Values</i>							
1% level	-3.610	-4.219	-2.626	-3.610	-4.212	-2.627	
5% level	-2.939	-3.533	-1.950	-2.939	-3.530	-1.950	
10% level	-2.608	-3.198	-1.612	-2.608	-3.196	-1.611	

According to the ADF-test and graphical inspection we conclude that, in the reduced sample, all variables are not stationary at levels. They become stationary after first differencing, thus all variables are integrated of order one, I(1) at 1% and 5% confidence interval.

Table 22. PP unit root test results, 1998Q1 – 2008Q3

Reduced sample 1998Q1-2008Q3							
Variables	Phillips-Perron Test Results						Final result
	Level: Adj. t-Stat			First differences: Adj. t-Stat			
	C	C+T	None	C	C+T	None	
LN(EG)	-2.840	-12.692	2.485	-29.268	-29.445	-13.690	I(1)
LN(TO)	-1.319	-5.172	-1.820	-16.036	-16.261	-11.566	I(1)
LN(FD1)	0.970	0.567	-1.077	-6.179	-14.193	-6.027	I(1)
LN(FD2)	2.127	-2.559	-2.818	-6.383	-7.564	-4.410	I(1)
LN(FD3)	2.395	-2.458	-2.233	-5.589	-7.230	-3.990	I(1)
LN(FD4)	-2.012	-2.502	0.026	-6.673	-6.637	-6.763	I(1)
LN(FD5)	-2.691	-2.181	-0.699	-8.141	-18.212	-8.065	I(1)
LN(FD6)	-0.491	-2.726	-4.890	-8.915	-8.687	-5.380	I(1)
LN(FD7)	-0.503	-2.028	-3.480	-6.671	-6.700	-5.402	I(1)
LN(FD8)	1.530	-3.332	-2.056	-5.972	-6.811	-4.783	I(1)
LN(FD9)	1.619	-3.257	-1.655	-5.361	-6.577	-4.504	I(1)
LN(FD10)	-2.381	-2.537	0.899	-6.544	-6.488	-6.512	I(1)
LN(FD11)	-0.337	-1.752	2.014	-7.107	-7.170	-6.704	I(1)
LN(FD12)	1.361	-3.134	-3.133	-7.236	-7.797	-5.171	I(1)
LN(FD13)	-4.359	-4.423	-0.029	-14.045	-13.79	-14.150	I(1)
<i>Mackinnon (1991) critical value for rejection of hypothesis of unit root applied: Test Critical Values</i>							
1% level	-3.597	-4.192	-2.621	-3.601	-4.199	-2.623	
5% level	-2.933	-3.521	-1.949	-2.935	-3.524	-1.949	
10% level	-2.605	-3.191	-1.612	-2.606	-3.193	-1.612	

We employ also the PP unit root test to be sure about the integration order of the time series employed in this thesis. As in the case of the full sample, we check for unit roots in levels and in first difference. The PP test results corroborate those obtained when using the ADF-test. All series under investigation are not stationary at levels; they become stationary in first differences. Thus, all series in the reduced sample are integrated of order one, I(1).

*Conclusion: in both samples, 1998Q1 – 2013Q2 and 1998Q1 – 2008Q3, all 15 variables under consideration are not stationary at levels according to graphical inspection, the ADF, and the PP-test. The variables become stationary in first differences, suggesting that all variables are integrated of order one, I(1)*

## V.2 Cointegration analysis

Since all variables under consideration are found to be integrated of the same order, we proceed with the cointegration analysis. To assess whether there is any cointegrating relationship between economic growth and financial development, we employ the Johansen Cointegration test. In all cases, we allow for a linear deterministic trend in the data, option 3 defined in E-Views. E-Views programme uses MacKinnon-Haug-Michelis (1999) p-values. An important step in the cointegration analysis consists in determining the optimal lag for the endogenous variables. Lag specification for differenced endogenous variables follows the information obtained by employing the lag order selection criteria. All lag order selection criteria are employed (sequential modified LR test statistic, final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan – Quinn information criterion (HQ)) paying special attention to the AIC and SC information criterion. Judgment based on the lag order selection criteria is combined with a general to specific approach, which consists in reducing the number of lags incrementally while checking for diagnostic tests: autocorrelation, normality, stability, and heteroscedasticity.

The Johansen cointegration test yields two statistics: the trace statistics and the maximum eigenvalue statistics. We conclude in favor of cointegration in case both tests suggest the same results. In t case test statistics suggest different results from each other on the number of cointegrating relationships, we conclude that there is no cointegration between the two (three) variables considered.

The cointegration analysis is performed in both samples: over the 1998Q1 – 2013Q2 period and over the 1998Q1 – 2008Q3 period, for both cases: the economic growth and financial development nexus; and the economic growth, financial development and trade openness nexus. In case of the economic growth and financial development nexus, we have only two possibilities:

presence of one cointegrating relationship or no cointegration between the variables. In case of the economic growth, financial development and trade openness nexus, we can have one, two or no cointegrating relationship between the variables. Table 23 and Table 24 summarize the outcomes from the Johansen cointegration test and in parenthesis the optimal lag selected.

Table 23. Cointegration analysis test results, finance-growth nexus

	$H_0$	Sample: 1998Q1 - 2013Q2		Final decision	Sample: 1998Q1 - 2008Q3		Final decision
		Trace	$\lambda_{max}$		Trace	$\lambda_{max}$	
EG-FD1	$r = 0$	0.0252 (4)	0.0300 (4)	Coint	0.0014 (4)	0.0266 (4)	Not Coint.
	$r \leq 1$	0.1819 (4)	0.1819 (4)		0.0026 (4)	0.0026 (4)	
EG-FD2	$r = 0$	0.0012 (4)	0.0021 (4)	Coint	0.0073 (3)	0.0077 (3)	Coint.
	$r \leq 1$	0.0887 (4)	0.0887 (4)		0.2044 (3)	0.2044 (3)	
EG-FD3	$r = 0$	0.0020 (4)	0.0034 (4)	Coint.	0.0013 (3)	0.0024 (3)	Coint.
	$r \leq 1$	0.0914 (4)	0.0914 (4)		0.0820 (3)	0.0820 (3)	
EG-FD4	$r = 0$	0.0002 (6)	0.0004 (6)	Coint.	0.0236 (5)	0.0167 (5)	Coint.
	$r \leq 1$	0.0606 (6)	0.0606 (6)		0.5200 (5)	0.5200 (5)	
EG-FD5	$r = 0$	0.0803 (5)	0.2357 (5)	Not Coint.	0.0234 (4)	0.0141 (4)	Coint.
	$r \leq 1$	0.0350 (5)	0.0350 (5)		0.9981 (4)	0.9981 (4)	
EG-FD6	$r = 0$	0.1006 (4)	0.2260 (4)	Not Coint.	0.1572 (4)	0.1148 (4)	Not Coint.
	$r \leq 1$	0.0571 (4)	0.0571 (4)		0.7471 (4)	0.7471 (4)	
EG-FD7	$r = 0$	0.0415 (4)	0.1011 (4)	Not Coint.	0.0513 (4)	0.0330 (4)	Not Coint.
	$r \leq 1$	0.0522 (4)	0.0522 (4)		0.8698 (4)	0.8698 (4)	
EG-FD8	$r = 0$	0.0016 (4)	0.0020 (4)	Coint.	0.0007 (4)	0.0079 (4)	Not Coint.
	$r \leq 1$	0.1544 (4)	0.1544 (4)		0.0058 (4)	0.0058 (4)	
EG-FD9	$r = 0$	0.0024 (4)	0.0031 (4)	Coint.	0.0001 (4)	0.0047 (4)	Not Coint.
	$r \leq 1$	0.1417 (4)	0.1417 (4)		0.0011 (4)	0.0011 (4)	
EG-FD10	$r = 0$	0.0015 (4)	0.0072 (4)	Not Coint.	0.2875 (4)	0.2759 (4)	Not Coint.
	$r \leq 1$	0.0186 (4)	0.0186 (4)		0.3750 (4)	0.3750 (4)	
EG-FD11	$r = 0$	0.0775 (5)	0.2435 (5)	Not Coint.	0.0732 (4)	0.0507 (4)	Not Coint.
	$r \leq 1$	0.0309 (5)	0.0309 (5)		0.6966 (4)	0.6966 (4)	
EG-FD12	$r = 0$	0.0003 (4)	0.0006 (4)	Coint.	0.0261 (4)	0.0243 (4)	Coint.
	$r \leq 1$	0.0586 (4)	0.0586 (4)		0.2889 (4)	0.2889 (4)	
EG-FD13	$r = 0$	0.0002 (4)	0.0006 (4)	Not Coint.	0.0516 (3)	0.2702 (3)	Not Coint.
	$r \leq 1$	0.0038 (4)	0.0038 (4)		0.0127 (3)	0.0127 (3)	

*Null hypothesis rejections at 5% level. L is the optimal number of lags. MacKinnon-Haug-Michelis (1999) p-values*

In the case of economic growth and financial development nexus, Johansen cointegration test over the full sample (1998Q1 to 2013Q2) suggest the presence of one cointegrating relationship between economic growth and financial development, when proxied by FD1, FD2, FD3, FD4,



FD8, FD9, FD12 at 5% level of confidence. No cointegration was found between financial development proxied by FD5, FD6, FD7, FD10, FD1, and FD13 and economic growth at 5% level of confidence.

Table 24. Cointegration analysis results, finance- growth nexus

<b>Relations</b>	<b>1998Q1-2013Q2</b>	<b>1998Q1-2008Q3</b>
EG-FD1	Cointegrated	Not Cointegrated
EG-FD2	Cointegrated	Cointegrated
EG-FD3	Cointegrated	Cointegrated
EG-FD4	Cointegrated	Cointegrated
EG-FD5	Not Cointegrated	Cointegrated
EG-FD6	Not Cointegrated	Not Cointegrated
EG-FD7	Not Cointegrated	Not Cointegrated
EG-FD8	Cointegrated	Not Cointegrated
EG-FD9	Cointegrated	Not Cointegrated
EG-FD10	Not Cointegrated	Not Cointegrated
EG-FD11	Not Cointegrated	Not Cointegrated
EG-FD12	Cointegrated	Cointegrated
EG-FD13	Not Cointegrated	Not Cointegrated

The same cointegration analysis is followed in the case of reduced sample, 1998Q1 – 2008Q3. When the shorter sample is considered, most of the cointegrating relationships found over the entire sample break down. Specifically, those between economic growth and financial development proxies FD1, FD8, FD9 no longer exist in the case of the reduced sample. The outcome might be due to the relatively small number of observations (43 in total). Trace test and maximum eigenvalue test statistics show that only five proxies of financial development (FD2, FD3, FD4, FD5, and FD12) are cointegrated with economic growth. The cointegrating relationship between economic growth proxies EG and financial development proxies FD2, FD3, FD4, and FD12 remain in both samples. A new cointegrating relationship emerges, the one between economic growth and financial development proxy FD5.

In the same way we conduct the cointegration analysis in the bivariate case, we perform Johansen cointegration test on the three variables case: economic growth (EG), financial development proxies (FD1-FD13) and trade openness (TO). Table 25 shows trace statistics, maximum eigenvalue, and the optimal lag in parenthesis - selected by the above mentioned criteria.

Table 25. Cointegration analysis test results, finance-growth-trade nexus

	H0	Sample: 1998Q1 - 2013Q2			Sample: 1998Q1 - 2008Q3		
		trace	$\lambda_{max}$	Decision	trace	$\lambda_{max}$	Decision.
EG-FD1-TO	$r = 0$	0.0000 (3)	0.0000 (3)	Coint.	0.0006 (4)	0.0145 (4)	Not Coint.
	$r \leq 1$	0.3684 (3)	0.4465 (3)		0.0130 (4)	0.0439 (4)	
	$r \leq 2$	0.2062 (3)	0.2062 (3)		0.0317 (4)	0.0317 (4)	
EG-FD2-TO	$r = 0$	0.0000 (3)	0.0000 (3)	Coint.	0.0001 (4)	0.0033 (4)	Not Coint.
	$r \leq 1$	0.1347 (3)	0.1863 (3)		0.0122 (4)	0.0833 (4)	
	$r \leq 2$	0.1491 (3)	0.1491 (3)		0.0104 (4)	0.0104 (4)	
EG-FD3-TO	$r = 0$	0.0006 (4)	0.0002 (4)	Coint.	0.0002 (4)	0.0034 (4)	Not Coint.
	$r \leq 1$	0.4751 (4)	0.7024 (4)		0.0138 (4)	0.0618 (4)	
	$r \leq 2$	0.1069 (4)	0.1069 (4)		0.0201 (4)	0.0201 (4)	
EG-FD4-TO	$r = 0$	0.0099 (4)	0.0187 (4)	Coint.	0.2117 (4)	0.4832 (4)	Not Coint.
	$r \leq 1$	0.1860 (4)	0.3779 (4)		0.2073 (4)	0.1509 (4)	
	$r \leq 2$	0.0641 (4)	0.0641 (4)		0.9573 (4)	0.9573 (4)	
EG-FD5-TO	$r = 0$	0.3191 (4)	0.2930 (4)	Not Coint.	0.0255 (4)	0.0039 (4)	Coint.
	$r \leq 1$	0.6133 (4)	0.6474 (4)		0.9172 (4)	0.9049 (4)	
	$r \leq 2$	0.3271 (4)	0.3271 (4)		0.5911 (4)	0.5911 (4)	
EG-FD6-TO	$r = 0$	0.2379 (4)	0.3874 (4)	Not Coint.	0.0808 (4)	0.0821 (4)	Not Coint.
	$r \leq 1$	0.3266 (4)	0.2577 (4)		0.4246 (4)	0.3597 (4)	
	$r \leq 2$	0.7780 (4)	0.7780 (4)		0.6540 (4)	0.6540(4)	
EG-FD7-TO	$r = 0$	0.1407 (4)	0.3631 (4)	Not Coint.	0.0070 (4)	0.0020 (4)	Coint.
	$r \leq 1$	0.1777 (4)	0.1322 (4)		0.6500 (4)	0.5686 (4)	
	$r \leq 2$	0.7299 (4)	0.7299 (4)		0.8532 (4)	0.8532 (4)	
EG-FD8-TO	$r = 0$	0.0000 (3)	0.0000 (3)	Coint.	0.0003 (4)	0.0037 (4)	Not Coint.
	$r \leq 1$	0.2722 (3)	0.4576 (3)		0.0258 (4)	0.0741 (4)	
	$r \leq 2$	0.0919 (3)	0.0919 (3)		0.0403 (4)	0.0403 (4)	
EG-FD9-TO	$r = 0$	0.0000 (3)	0.0000 (3)	Coint.	0.1126 (5)	0.1825 (5)	Not Coint.
	$r \leq 1$	0.2039 (3)	0.3771 (3)		0.2974 (5)	0.4459 (5)	
	$r \leq 2$	0.0778 (3)	0.0778 (3)		0.1203 (5)	0.1203 (5)	
EG-FD10-TO	$r = 0$	0.0226 (4)	0.0209 (4)	Coint.	0.4586 (4)	0.7355 (4)	Not Coint.
	$r \leq 1$	0.3716 (4)	0.7212 (4)		0.3308 (4)	0.2582 (4)	
	$r \leq 2$	0.0521 (4)	0.0521 (4)		0.8469 (4)	0.8469 (4)	
EG-FD11-TO	$r = 0$	0.0000 (3)	0.0000 (3)	Coint.	0.0311 (4)	0.0164 (4)	Coint.
	$r \leq 1$	0.1434 (3)	0.2726 (3)		0.5668 (4)	0.4784 (4)	
	$r \leq 2$	0.0770 (3)	0.0770 (3)		0.9588 (4)	0.9588 (4)	
EG-FD12-TO	$r = 0$	0.0000 (3)	0.0000 (3)	Coint.	0.0003 (4)	0.0008 (4)	Coint.
	$r \leq 1$	0.2161 (3)	0.2788 (3)		0.1086 (4)	0.2008 (4)	
	$r \leq 2$	0.1754 (3)	0.1754 (3)		0.0833 (4)	0.0833 (4)	
EG-FD13-TO	$r = 0$	0.0000 (4)	0.0000 (4)	Not Coint.	0.0000 (4)	0.0000 (4)	Coint.

	$r \leq 1$	0.0044 (4)	0.0243 (4)		0.0769 (4)	0.0510 (4)	
	$r \leq 2$	0.0155 (4)	0.0155 (4)		0.8915 (4)	0.8915 (4)	
<i>Null hypothesis rejections at 5% level. L is the optimal number of lags. MacKinnon-Haug-Michelis (1999) p-values</i>							

In the case of full sample from 1998Q1 to 2013Q2, Johansen cointegration tests suggest the presence of cointegrating relationships between the financial development proxies FD1, FD2, FD3, FD4, FD8, FD9, FD10, FD11 and FD12, economic growth proxy and trade openness proxy at 5% level of confidence. The inclusion of a third variable, such as trade openness, seems to have increased the number of cointegrating relationships among variables. No cointegration was found between economic growth, the financial development proxies FD5, FD6, FD7, FD13 and the trade openness proxy at 5% level of confidence.

Table 26. Cointegration analysis results, finance-growth-trade nexus

<b>Relations</b>	<b>1998Q1-2013Q2</b>	<b>1998Q1-2008Q3</b>
EG-FD1-TO	Cointegrated	Not Cointegrated
EG-FD2-TO	Cointegrated	Not Cointegrated
EG-FD3-TO	Cointegrated	Not Cointegrated
EG-FD4-TO	Cointegrated	Not Cointegrated
EG-FD5-TO	Not Cointegrated	Cointegrated
EG-FD6-TO	Not Cointegrated	Not Cointegrated
EG-FD7-TO	Not Cointegrated	Cointegrated
EG-FD8-TO	Cointegrated	Not Cointegrated
EG-FD9-TO	Cointegrated	Not Cointegrated
EG-FD10-TO	Cointegrated	Not Cointegrated
EG-FD11-TO	Cointegrated	Cointegrated
EG-FD12-TO	Cointegrated	Cointegrated
EG-FD13-TO	Not Cointegrated	Cointegrated

In the case of the pre-crisis period, even when trade openness enters the estimation, the number of cointegrating relationships remains limited. Cointegration relationships between economic growth, financial development proxied by FD1, FD2, FD3, FD4, FD8, FD9, FD10 and trade openness break down when the sample period is reduced to 2008Q3. The cointegrating relationship between economic growth, financial development proxied by FD11, FD12 and trade openness persist even in the context of a reduced sample. Furthermore, two new cointegrating relationships emerge between economic growth, financial development proxied by FD5, FD7,

FD13 and trade openness. Overall, in the three variable cases over the period 1998Q1 – 2008Q3 five cointegrating relationships can be observed.

### V.3 Causality patterns

In this section, we provide empirical results regarding the short-run and long-run causality between economic growth and financial development (13 proxies); economic growth, financial development (13 proxies) and trade openness. We assess long and short-term causality issues in both cases using a full sample 1998Q1 – 2013Q2 and a shorter sample 1998Q1 – 2008Q3. The aim is to assess whether financial crisis has modified the causality patterns in the growth-finance nexus and growth-finance-trade nexus. Overall, we estimate about 52 equations (26 equations in full sample and 26 equations in reduced sample) to test our research hypothesis.

As explained in the section of unit root tests, we assess the long-run causality in a VECM context for variables integrated of order one I(1) and found to be cointegrated. In cases when variables integrated of order one I(1) but not cointegrated, the causality issue is explored in a VAR context (after first-differencing variables in order to be stationary). The VAR order is determined using the common lag length criteria: sequential modified LR test statistic, final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan – Quinn information criterion (HQ), combined with the general-to-specific approach

Table 27. VAR-VECM framework for causality analysis in finance – growth nexus

Relations		1998Q1-2013Q2	Causality assessment:	1998Q1-2008Q3	Causality assessment:
1	EG-FD1	Cointegrated	VECM	Not Cointegrated	VAR(p)
2	EG-FD2	Cointegrated	VECM	Cointegrated	VECM
3	EG-FD3	Cointegrated	VECM	Cointegrated	VECM
4	EG-FD4	Cointegrated	VECM	Cointegrated	VECM
5	EG-FD5	Not Cointegrated	VAR(p)	Cointegrated	VECM
6	EG-FD6	Not Cointegrated	VAR(p)	Not Cointegrated	VAR(p)
7	EG-FD7	Not Cointegrated	VAR(p)	Not Cointegrated	VAR(p)
8	EG-FD8	Cointegrated	VECM	Not Cointegrated	VAR(p)
9	EG-FD9	Cointegrated	VECM	Not Cointegrated	VAR(p)
10	EG-FD10	Not Cointegrated	VAR(p)	Not Cointegrated	VAR(p)
11	EG-FD11	Not Cointegrated	VAR(p)	Not Cointegrated	VAR(p)
12	EG-FD12	Cointegrated	VECM	Cointegrated	VECM
13	EG-FD13	Not Cointegrated	VAR(p)	Not Cointegrated	VAR(p)

Source:

Table 28. VAR-VECM framework for causality analysis in finance-growth-trade nexus

Relations		1998Q1-2013Q2	Causality assessment	1998Q1-2008Q3	Causality assessment
1	EG-FD1-TO	Cointegrated	VECM	Not Cointegrated	VAR(p)
2	EG-FD2-TO	Cointegrated	VECM	Not Cointegrated	VAR(p)
3	EG-FD3-TO	Cointegrated	VECM	Not Cointegrated	VAR(p)
4	EG-FD4-TO	Cointegrated	VECM	Not Cointegrated	VAR(p)
5	EG-FD5-TO	Not Cointegrated	VAR(p)	Cointegrated	VECM
6	EG-FD6-TO	Not Cointegrated	VAR(p)	Not Cointegrated	VAR(p)
7	EG-FD7-TO	Not Cointegrated	VAR(p)	Cointegrated	VECM
8	EG-FD8-TO	Cointegrated	VECM	Not Cointegrated	VAR(p)
9	EG-FD9-TO	Cointegrated	VECM	Not Cointegrated	VAR(p)
10	EG-FD10-TO	Cointegrated	VECM	Not Cointegrated	VAR(p)
11	EG-FD11-TO	Cointegrated	VECM	Cointegrated	VECM
12	EG-FD12-TO	Cointegrated	VECM	Cointegrated	VECM
13	EG-FD13-TO	Not Cointegrated	VAR(p)	Cointegrated	VECM

### V 3.1 Long term causality

Having found out the cointegrating relationships, we estimate the VECM and judge on the long run causality based on the sign and the statistical significance of the error correction term. The short run causality is investigated by applying the Granger Causality/Block Exogeneity Wald Test.

When the full sample period is considered we estimate seven VECMs to assess the long run causality patterns between economic growth and proxies of financial development. In all seven long run relationships, we find out that financial development as proxied by FD1, FD2, FD3, FD4, FD8, FD9, FD12 affects positively economic growth. Accordingly, over the entire period (Table 29), the error correction term in all estimated VECMs, where economic growth is the dependent variable, has the right sign (negative) and is statistically significant. This implies that causality runs from financial development to economic growth. More specifically, in the long-run: FD1 (domestic credit/GDP), FD2 (credit to the private sector/GDP), FD3 (total credit excl. credit to the government/GDP), FD4 (M1/GDP), FD8 (credit to private sector/total deposits), FD9 (total credit excl. credit to the government/GDP) and FD12 (credit to the private sector/domestic credit) cause economic growth.

Table 29. Finance-growth nexus: long run causality patterns over 1998Q1-2013Q2

		Sample: 1998Q1 - 2013Q2		
		Error correction term coefficient (t-statistics)		Long-run direction of causality
		$\Delta EG$	$\Delta FD$	
1	$\Delta FD1$	-0.0899 (-2.421)	0.0971 (2.814)	FD→EG
2	$\Delta FD2$	-0.3156 (-4.008)	0.2579 (1.546)	FD→EG
3	$\Delta FD3$	-0.2634 (-3.646)	0.2663 (1.932)	FD→EG
4	$\Delta FD4$	-0.0639 (-2.658)	0.1703 (3.905)	FD→EG
5	$\Delta FD8$	-0.2790 (-3.977)	0.2502 (1.617)	FD→EG
6	$\Delta FD9$	-0.2253 (-3.479)	0.2891 (2.175)	FD→EG
7	$\Delta FD12$	-0.3716 (-4.775)	0.1177 (0.767)	FD→EG

In the pre-crisis period (1998Q1 – 2008Q3), we have found five cointegrated relationships. Empirical results show that there is a positive long-run relationship between economic growth and proxies of financial development, respectively FD2, FD3, FD4, FD5 and FD12. Only in three out of five estimated VECMS (where economic growth is the dependent variable), the error correction term is significant and has the correct sign. We conclude that there is a positive long term relationship between economic growth and financial development as proxied by FD2 (credit to private sector/GDP), FD3 (total credit excl. credit to government/GDP), FD4 (M1/GDP), FD5 (M2/GDP) FD12 (credit to private sector/domestic credit) and causality running from financial development to economic growth only in the case of FD2, FD3, and FD12. No causality patterns can be evidenced in cases when financial development is proxied by FD4 and FD5. The long run relationships between economic growth and financial development proxied by FD2, FD3 and FD12 are present and significant in both samples: 1998Q1-2013Q2 and 1998Q1-2008Q3. The financial crisis seems to have not affected these relationships, although the error correction terms have smaller but significant coefficients.

Table 30. Finance-growth nexus: long run causality patterns over 1998Q1 – 2008Q3

		Sample: 1998Q1 - 2008Q3		
		Error correction term coefficient (t-statistics)		Long-run direction of causality
		$\Delta EG$	$\Delta FD$	
1	$\Delta FD2$	-0.2446 (-3.942)	0.2034 (1.156)	FD→EG
2	$\Delta FD3$	-0.2035 (-4.236)	0.1592 (1.239)	FD→EG
3	$\Delta FD4$	0.0366 (1.472)	0.2009 (3.686)	No causality
4	$\Delta FD5$	0.0635 (1.945)	0.0731 (3.590)	No causality
5	$\Delta FD12$	-0.2680 (-3.012)	0.456 2(2.100)	FD→EG

Overall, we can conclude that in the long-run, there is a uni-directional relationship between financial and economic growth in Albania with causality running from financial development to economic growth.

In the next phase, we introduce a third variable, trade openness, in the finance and growth nexus and explore the causality patterns of the stated relationships. First, we consider the full sample from 1998Q1 to 2013Q2. We estimate the VECM for the existing cointegrating relationships (Table 31). Adding trade openness to the growth –finance nexus did not alter the cointegration relationships found in the bivariate cases. Furthermore, we found two more cointegrating relationships, which did not exist when not only finance and growth proxies were considered. In the long-run, both financial development (as measured by FD1, FD2, FD3, FD4, FD8, FD9, FD10, FD11 and FD12) and trade openness are found to exert a positive influence on economic growth. Trade openness seems not to change the long-run causality between economic growth and financial development. In the long-run, financial development as proxied by FD1 (Domestic credit/GDP), FD2 (credit to private sector/GDP), FD8 (credit to private sector/total deposits), FD9 (total credit excl. credit to government/total deposits) and trade openness exhibit a positive relation with economic growth with causality direction running from finance and trade openness to economic growth. All coefficients in the error correction terms present the correct sign, lie between the range 0 - 1 and are statistically significant. Contemporarily, economic growth and financial development as proxied by FD1 (Domestic credit/GDP), FD2 (credit to private sector/GDP), FD8 (credit to private sector/total deposits), FD9 (total credit excl. credit to government/total deposits) positively affect trade openness with causality direction from economic growth and financial development to trade openness. The coefficients on the error correction term present the correct sign, range between 0 and 1, and are statistically significant. When financial development is proxied by FD3 (total credit excl. credit to government), FD11 (M3/monetary base), finance and trade are found to have positive impact on economic growth, with causality running from finance and trade openness to economic growth. When financial development is proxied by FD4 (M1/GDP), we find evidence for causality running from economic growth and trade openness to financial development in the long run. Despite being statistically significant and presenting the correct sign, the coefficient is very low, the lowest among coefficients on error correction terms. When financial development is proxied by FD10 (M3/M1), we find no evidence of any long run causal relationship. The coefficients on the error

correction terms despite being statistically significant as by t-statistics, none of them presents the correct sign. In the case financial development is proxied by FD12 (credit to private sector/domestic credit), we find causality running simultaneously in all directions. All the adjustment coefficients in the error term are significant, present the correct sign and lie between the 0 and 1.

Overall, despite the introduction of trade openness in the finance and growth nexus, we still find strong support for the finance led growth hypothesis.

Table 31. Finance-growth-trade nexus: long run causality patterns over 1998Q1-2013Q2

		Sample: 1998Q1 - 2013Q2			Long-run direction of causality
		Error correction term coefficient (t-statistics)			
		$\Delta$ EG	$\Delta$ FD	$\Delta$ TO	
1	$\Delta$ FD1	-0.1109 (-6.935)	0.0350 (2.394)	-0.1835 (-3.386)	FD & TO $\rightarrow$ EG and EG & FD $\rightarrow$ TO
2	$\Delta$ FD2	-0.4693 (-8.891)	-0.1229 (1.023)	-0.5461 (-2.531)	FD & TO $\rightarrow$ EG and EG & FD $\rightarrow$ TO
3	$\Delta$ FD3	-0.3886 (-3.971)	0.3134 (1.579)	-1.0374 (-2.694)	FD & TO $\rightarrow$ EG
4	$\Delta$ FD4	0.0055 (3.114)	-0.0086 (-2.390)	0.0182 (2.586)	EG & TO $\rightarrow$ FD
5	$\Delta$ FD8	-0.3981 (-8.298)	-0.0896 (-0.774)	-0.4942 (-2.536)	FD & TO $\rightarrow$ EG and EG & FD $\rightarrow$ TO
6	$\Delta$ FD9	-0.3694 (-7.701)	0.0157 (0.143)	-0.4765 (-2.514)	FD & TO $\rightarrow$ EG and EG & FD $\rightarrow$ TO
7	$\Delta$ FD10	0.0544 (3.073)	0.0764 (2.188)	0.2022 (2.909)	no long run causality evidence
8	$\Delta$ FD11	-0.2338 (-7.422)	0.1087 (2.047)	-0.2102 (-1.695)	FD & TO $\rightarrow$ EG
9	$\Delta$ FD12	-0.4754 (-9.619)	-0.2424 (-2.400)	-0.4773 (-2.218)	FD & TO $\rightarrow$ EG, EG & TO $\rightarrow$ FD, EG & FD $\rightarrow$ TO

Now we consider a shorter sample, from 1998Q1 to 2008Q3 and check for causality patterns in the growth-finance-trade nexus. As in the case of the finance and growth nexus, the number of cointegrating relationships is lower when compared to the case of the full sample analysis (four less). In cases when financial development is proxied by FD7 (total deposits/GDP), FD11 (M3/monetary base), FD12 (credit to private sector/domestic credit), financial development and trade openness impact positively economic growth with causality running from financial development and trade openness to economic growth. All coefficients have the correct sign, with magnitude ranging from -1 to 0, and are statistically significant. When financial development is proxied by FD5 (M2/GDP) and FD13 (interest rate spread), we do not find evidence for any causality patterns. Coefficients on the error correction terms do not have the correct sign despite some of them being statistically significant. No evidence for reverse causality (from economic growth and trade openness to financial development) is found. The error correction term



coefficients do not present the correct sign even though some of them result statistically significant. Overall, we find evidence for the finance and trade led growth hypothesis.

Compared to the results obtained over the shorter sample (with and without the trade openness variable) we can observe two common cointegrating relationships between economic growth and financial development measured by FD5 (M2/GDP) and FD12 (credit to private sector/domestic credit) and between economic growth, financial development measured by FD5 (M2/GDP) and FD12 (credit to private sector/domestic credit) and trade openness. The same holds form the causality direction. In both cases, we find significant causality running from finance / finance and trade to economic growth.

Table 32. Finance-growth-trade nexus: long run causality patterns over 1998Q1-2008Q3

		Sample: 1998Q1 - 2008Q3			Long-run direction of causality
		Error correction term coefficient (t-statistics)			
		$\Delta EG$	$\Delta FD$	$\Delta TO$	
1	$\Delta FD5$	0.0846 (1.591)	0.1203 (3.619)	0.3267 (1.808)	no long run causality evidence
2	$\Delta FD7$	-0.3069 (-3.363)	0.0202 (0.165)	-1.012 (-2.561)	FD & TO $\rightarrow$ EG
3	$\Delta FD11$	-0.3322 (-3.391)	0.2402 (1.738)	-0.6611 (-1.391)	FD & TO $\rightarrow$ EG
4	$\Delta FD12$	-0.3472 (-2.519)	0.6278 (2.201)	-0.9378 (-1.375)	FD & TO $\rightarrow$ EG
5	$\Delta FD13$	0.0332 (0.744)	2.5541 (11.070)	0.1363 (0.970)	no long run causality evidence

Overall, considering both full and shorter sample, with two and three variables, we find strong empirical evidence to support the finance (finance and trade) led growth hypothesis in the long-run. The results are sensible to the sample size but less sensible to the proxy used to account for financial development.

### V 3.2 Short term causality

This section presents result on, short-run causality over full and shorter sample. For those variables found to be cointegrated we check short term causality by running the VEC Granger causality/Block Exogeneity Wald Test. For those variables not presenting any cointegrating relationships, we will assess the causality using the same test in a VAR context. In any of the VAR equations considered, the output displays  $\chi^2$  (Wald) statistics for the joint significance of each of the other lagged endogenous variables in the equation. Also it displays  $\chi^2$  (Wald)

statistics for the joint significance of all other lagged endogenous variables in the equation. In the case of two variables these two statistics present the same values.

With regard to short run causality in the finance – growth nexus, when the full sample period is considered, we find strong evidence for causality running from economic growth to financial development at 5% confidence level. This result is valid for 10 out of 13 proxies used to measure financial development. In the case financial development is proxied by FD4 (M1/GDP) we find the existence of bi-directional causality in the growth and finance nexus. No short term causality is evidenced in the cases when financial development is proxied by FD12 (credit to private sector/domestic credit) and FD13 (interest rate spread). All evaluations are performed at 5% confidence level.

Table 33. Finance-growth nexus: short run causality patterns over 1998Q1 – 2013Q2

Estimated relationships		Sample: 1998Q1 - 2013Q2		Short run causality
		$\chi^2$ Probabilities (5% level)		
		EG-FD*	FD-EG**	
EG-FD1	VECM	0.0016	0.5683	EG→FD
EG-FD2	VECM	0.0158	0.6060	EG→FD
EG-FD3	VECM	0.0090	0.8398	EG→FD
EG-FD4	VECM	0.0000	0.0277	Bi-directional
EG-FD5	VAR(4)	0.0088	0.2804	EG→FD
EG-FD6	VAR(4)	0.0051	0.3618	EG→FD
EG-FD7	VAR(4)	0.0011	0.1201	EG→FD
EG-FD8	VECM	0.0002	0.2852	EG→FD
EG-FD9	VECM	0.0001	0.6338	EG→FD
EG-FD10	VAR(4)	0.0001	0.0960	EG→FD
EG-FD11	VAR(5)	0.0194	0.0553	EG→FD
EG-FD12	VECM	0.0621	0.0773	no short-run causality
EG-FD13	VAR(6)	0.7442	0.8663	no short-run causality

\*H0: EG does not Granger cause FD; \*\*H0: FD does not Granger cause EG; H0 rejected at 5% confidence level. VAR order in ().

Short run causality analysis in the shorter sample offers a quite different picture. Before the emergence and spread of the global financial crisis, the short-run causal relationship between financial development and economic growth in Albania displays different directions, according to the proxy used to measure financial development.

In the pre-crisis period, we found more empirical evidence on bi-directional causality between financial development and economic growth. Thus, at 5% confidence level, 5 out of 13 proxies of financial development Granger-cause and are Granger-caused by real GDP. Namely, FD4 (M1/GDP), FD7 (total deposits/GDP), FD8 (credit to private sector/total deposits), FD10 (M3/M1), FD12 (credit to private sector/domestic credit) cause and are caused by economic growth. When financial development is proxied by FD1 (domestic credit/GDP), FD5 (M2/GDP), FD11 (M3/monetary base) evidence suggest for causality running from economic growth to financial development. In the case of financial development proxied by FD2 (credit to private sector/GDP), FD3 (total credit excl. credit to government/GDP), FD9 (total credit excl. credit to government/total deposits), causality runs from economic growth to financial development at 5% confidence level. No short run causality was evidenced between finance and growth in the case financial development was proxied by FD13 (interest rate spread) and FD6 (M3/GDP).

Table 34. Finance-growth nexus: short run causality patterns over 1998Q1-2008Q3

Sample: 1998Q1 - 2008Q3				
Estimated relationships		$\chi^2$ Probabilities (5% level)		Short run causality:
		EG-FD*	FD-EG**	
EG-FD1	VAR (4)	0.0222	0.5521	EG→FD
EG-FD2	VECM	0.1108	0.0000	FD→EG
EG-FD3	VECM	0.1316	0.0000	FD→EG
EG-FD4	VECM	0.0105	0.0202	bi-directional causality
EG-FD5	VECM	0.0000	0.2342	EG→FD
EG-FD6	VAR (4)	0.0652	0.1580	no short-run causality
EG-FD7	VAR (5)	0.0419	0.0146	bi-directional causality
EG-FD8	VAR (3)	0.0336	0.0000	bi-directional causality
EG-FD9	VAR (3)	0.0581	0.0000	FD→EG
EG-FD10	VAR (4)	0.0001	0.0150	bi-directional causality
EG-FD11	VAR (4)	0.0003	0.0569	EG→FD
EG-FD12	VECM	0.0135	0.0009	bi-directional causality
EG-FD13	VAR (5)	0.8818	0.8324	no short-run causality
*H0: EG does not Granger cause FD; **H0: FD does not Granger cause EG; H0 rejected at 5% confidence level. VAR order in ().				

As results show, the onset of the global financial crisis has modified the causality patterns in the finance and growth nexus in the case of Albania leading to a clear direction of causality from economic growth to financial development in the short-run.

The following table presents the results on short-run causality with trade openness included in the estimation over full sample 1998Q1 – 2013Q2.

Table 35. Finance-growth-trade nexus: short run causality patterns over 1998Q1 -2013Q2

Sample: 1998Q1 - 2013Q2									
	FD-EG	TO-EG	(FD,TO)-EG	EG-FD	TO-FD	(EG,TO)-FD	EG-TO	FD-TO	(EG,FD)-TO
EG-FD1-TO	0.263	0.824	0.602	0.001	0.708	0.002	0.056	0.033	0.003
EG-FD2-TO	0.721	0.004	0.015	0.169	0.423	0.254	0.006	0.430	0.011
EG-FD3-TO	0.910	0.008	0.042	0.031	0.498	0.037	0.000	0.437	0.001
EG-FD4-TO	0.003	0.555	0.005	0.00	0.014	0.000	0.379	0.564	0.194
EG-FD5-TO	0.297	0.139	0.138	0.004	0.032	0.0010	0.163	0.267	0.011
EG-FD6-TO	0.737	0.062	0.146	0.008	0.636	0.034	0.012	0.474	0.009
EG-FD7-TO	0.393	0.107	0.059	0.097	0.197	0.022	0.077	0.838	0.028
EG-FD8-TO	0.057	0.008	0.003	0.014	0.667	0.052	0.014	0.667	0.052
EG-FD9-TO	0.274	0.009	0.011	0.019	0.792	0.067	0.006	0.596	0.019
EG-FD10-TO	0.003	0.463	0.005	0.000	0.012	0.000	0.859	0.447	0.462
EG-FD11-TO	0.247	0.132	0.051	0.000	0.432	0.003	0.008	0.253	0.031
EG-FD12-TO	0.012	0.004	0.000	0.539	0.143	0.145	0.009	0.644	0.019
EG-FD13-TO	0.758	0.212	0.357	0.031	0.169	0.063	0.004	0.000	0.000

FD→EG: FD does not Granger Cause EG; TO does not Granger cause EG; FD and TO does not Granger Cause EG. Null hypothesis is rejected at 5% level.

When trade openness enters the analysis we find mixed evidence on the causality patterns. In 7 out of 13 cases we find that financial development and trade openness cause economic growth. More evidence (8 out of 13 cases) is found for causality running from economic growth and trade openness to financial development. The result is consistent with the previous case when trade openness was not taken into account. It seems like accounting for the degree of openness of the economy does not alter the results in terms of causality direction, suggesting for a clear causality running from economic growth to financial development. In 10 out of 13 cases, results show that economic growth and financial development have causal effects on trade openness. In one case, when financial development is proxied by FD3 (total credit excl. credit to government/GDP), there is a simultaneous causality running in three directions: from financial development and trade openness to economic growth, from economic growth and trade openness to financial developments, from economic growth and financial development to trade openness. We find evidence on causality running from financial development and trade openness to

economic growth, and from economic growth and trade openness to financial development, in those cases when financial development is proxied by FD4 (M1/GDP) and FD10 (M3/M1). Also, in about 4 cases we find that economic growth and trade openness Granger cause financial development, and that economic growth and financial development Granger cause trade openness.

Table 36. Short run causality patterns over 1998Q1-2013Q2

Sample: 1998Q1 - 2013Q2									
	FD-EG	TO-EG	(FD,TO)-EG	EG-FD	TO-FD	(EG,TO)-FD	EG-TO	FD-TO	(EG,FD)-TO
EG-FD1-TO				x		x		x	x
EG-FD2-TO		x	x				x		x
EG-FD3-TO		x	x	x		x	x		x
EG-FD4-TO	x		x	x	x	x			
EG-FD5-TO				x	x	x			x
EG-FD6-TO				x		x	x		x
EG-FD7-TO						x			x
EG-FD8-TO		x	x	x			x		
EG-FD9-TO		x	x	x			x		x
EG-FD10-TO	x		x	x	x	x			
EG-FD11-TO				x		x	x		x
EG-FD12-TO	x	x	x				x		x
EG-FD13-TO							x	x	x

FD→EG: FD does not Granger Cause EG; TO does not Granger cause EG; FD and TO does not Granger Cause EG. Null hypothesis is rejected at 5% level.

Therefore, we find relevant evidence on the growth-led financial development hypothesis in both cases: with and without the variable trade openness. It is important to underline the new channel of causality running from economic growth and financial development to trade openness.

In order to assess whether the onset of financial crisis modified the casual relationships in the short-run, we check the causality patterns in the pre-crisis period 1998Q1 -2008Q3. The results are summarized in Table 37 and Table 38.

Table 37. Finance-growth-trade nexus: short run causality patterns over 1998Q1-2008Q3

Sample: 1998Q1 - 2008Q3									
	FD→EG	TO→EG	(FD,TO)→EG	EG→FD	TO→FD	(EG,TO)→FD	EG→TO	FD→TO	(EG,FD)→TO
EG-FD1-TO	0.076	0.665	0.084	0.275	0.973	0.531	0.000	0.003	0.000
EG-FD2-TO	0.028	0.366	0.032	0.738	0.116	0.119	0.002	0.096	0.004
EG-FD3-TO	0.040	0.572	0.045	0.653	0.047	0.058	0.001	0.046	0.001
EG-FD4-TO	0.029	0.073	0.008	0.008	0.449	0.025	0.097	0.628	0.017
EG-FD5-TO	0.420	0.582	0.406	0.000	0.871	0.000	0.031	0.006	0.003
EG-FD6-TO	0.386	0.664	0.368	0.283	0.915	0.522	0.009	0.155	0.009
EG-FD7-TO	0.224	0.411	0.103	0.560	0.566	0.622	0.011	0.028	0.004
EG-FD8-TO	0.005	0.286	0.005	0.282	0.014	0.001	0.005	0.094	0.004
EG-FD9-TO	0.011	0.525	0.012	0.326	0.006	0.001	0.005	0.034	0.001
EG-FD10-TO	0.009	0.112	0.006	0.000	0.089	0.000	0.736	0.803	0.434
EG-FD11-TO	0.316	0.008	0.002	0.000	0.000	0.000	0.340	0.082	0.067
EG-FD12-TO	0.013	0.127	0.004	0.011	0.027	0.000	0.152	0.969	0.500
EG-FD13-TO	0.485	0.222	0.408	0.000	0.000	0.000	0.472	0.002	0.002

FD→EG; FD does not Granger Cause EG; TO does not Granger cause EG; FD and TO does not Granger Cause EG. Null hypothesis is rejected at 5% level.

In the pre-crisis period, when the degree of trade openness of the economy is considered, we find almost the same number of cases on causality patterns: 8 out of 13 cases in which causality runs from financial development – trade openness to economic growth and 8 out of 13 cases in which causality runs from economic growth and trade openness to financial development. Bi-directional causality from financial development (and trade openness) to economic growth and from economic growth (and trade openness) to financial development is found in cases when financial development is proxied by: FD4 (M1/GDP), FD8 (credit to private sector/total deposits), FD9 (total credit excl. credit to government/total deposits), FD10 (M3/M1), FD11 (M3/monetary base), FD12 (credit to private sector/domestic credit). There are three cases where short run causality runs simultaneously in three directions: from financial development and trade openness to economic growth; from economic growth and trade openness to financial development; and from economic growth and financial development to trade openness. Such result is valid when financial development is proxied by FD4 (M1/GDP), FD8 (credit to private sector/total deposits), FD9 (total credit excl. credit to government/total deposits). In 10 out of 13 cases, we find strong evidence that economic growth and financial development does Granger cause trade openness.

Table 38. Short run causality patterns over 1998Q1 – 2008Q3

Sample: 1998Q1 - 2008Q3									
	FD-EG	TO-EG	(FD,TO)-EG	EG-FD	TO-FD	(EG,TO)-FD	EG-TO	FD-TO	(EG,FD)-TO
EG-FD1-TO							X	X	X
EG-FD2-TO	X		X				X		X
EG-FD3-TO	X		X		X		X	X	X
EG-FD4-TO	X		X	X		X			X
EG-FD5-TO				X		X	X	X	X
EG-FD6-TO							X		X
EG-FD7-TO							X	X	X
EG-FD8-TO	X		X		X	X	X		X
EG-FD9-TO	X		X		X	X	X	X	X
EG-FD10-TO	X		X	X		X			
EG-FD11-TO		X	X	X	X	X			
EG-FD12-TO	X		X	X	X	X			
EG-FD13-TO				X	X	X		X	X

FD-EG: FD does not Granger Cause EG; TO-EG: TO does not Granger cause EG; FD and TO does not Granger Cause EG. Null hypothesis is rejected at 5% level.

First, on the short run causality over the pre-crisis period, first we observed that there is more evidence on bi-directional causality between finance and growth. Second, empirical evidence shows mixed results depending on the proxy used to measure financial development. Third, the outbreak of the financial crisis seems to have affected considerably the causality patterns among variables. In the full sample from 1998Q1 – 2013Q2 we find strong evidence for short run causality running from economic growth to financial development. The same results are confirmed when trade openness is taken into account.

#### V.4 Diagnostic tests

All the considered relationships satisfy the stability condition. In all VARs estimated, we find that no root lies outside the unit circle, and in all VECMs estimated we find that there are (n-r) unit roots imposed, where n is the number of endogenous variables, and r is the number of cointegrating relationships found between these (n) endogenous variables.

Table 39. Diagnostic tests: stability condition test

<b>STABILITY CONDITION</b>				
	<b>EG-FD</b>		<b>EG-FD-TO</b>	
	<b>1998Q1 - 2013Q2</b>	<b>1998Q1 - 2008Q3</b>	<b>1998Q1 - 2013Q2</b>	<b>1998Q1 2008Q3</b>
1	VEC specification imposes 1 unit root(s).	No root lies outside the unit circle.	VEC specification imposes 2 unit root(s).	No root lies outside the unit circle.
2	VEC specification imposes 1 unit root(s).	VEC specification imposes 1 unit root(s).	VEC specification imposes 2 unit root(s).	No root lies outside the unit circle.
3	VEC specification imposes 1 unit root(s).	VEC specification imposes 1 unit root(s).	VEC specification imposes 2 unit root(s).	No root lies outside the unit circle.
4	VEC specification imposes 1 unit root(s).	VEC specification imposes 1 unit root(s).	VEC specification imposes 2 unit root(s).	No root lies outside the unit circle.
5	No root lies outside the unit circle.	VEC specification imposes 1 unit root(s).	No root lies outside the unit circle.	VEC specification imposes 2 unit root(s).
6	No root lies outside the unit circle.	No root lies outside the unit circle.	No root lies outside the unit circle.	No root lies outside the unit circle.
7	No root lies outside the unit circle.	No root lies outside the unit circle.	No root lies outside the unit circle.	VEC specification imposes 2 unit root(s).
8	VEC specification imposes 1 unit root(s).	No root lies outside the unit circle.	VEC specification imposes 2 unit root(s).	No root lies outside the unit circle.
9	VEC specification imposes 1 unit root(s).	No root lies outside the unit circle.	VEC specification imposes 2 unit root(s).	No root lies outside the unit circle.
10	No root lies outside the unit circle.	No root lies outside the unit circle.	VEC specification imposes 2 unit root(s).	No root lies outside the unit circle.
11	No root lies outside the unit circle.	No root lies outside the unit circle.	VEC specification imposes 2 unit root(s).	VEC specification imposes 2 unit root(s).
12	VEC specification imposes 1 unit root(s).	VEC specification imposes 1 unit root(s).	VEC specification imposes 2 unit root(s).	VEC specification imposes 2 unit root(s).
13	No root lies outside the unit circle.	No root lies outside the unit circle.	No root lies outside the unit circle.	VEC specification imposes 2 unit root(s).

Results on residuals' autocorrelation are not provided in this material due to the big space they occupy. However, they are available by the author upon request the null hypothesis stating that there is no autocorrelation in residuals is accepted when the p-value of LM test is found to be greater than 1%, 5% or 10% level of confidence, depending which level we consider. The autocorrelation LM test shows that most of VAR or VECM specifications satisfy the autocorrelation test at 5% level of confidence, with some exceptions which satisfy such tests only at 1% level of confidence.

In general, all specifications do not suffer from heteroscedasticity (at 5% level) with very few exceptions, which are highlighted in Table 40. The null hypothesis is that there is no heteroscedasticity. Since most of the p-values of Chi-sq are greater than 5% level of confidence, we accept the null hypothesis and conclude that VAR or VECM specifications do not suffer from heteroscedasticity. If we consider 1% confidence levels, the results improve considerably.



Table 40. Diagnostic tests: heteroscedasticity test

<b>HETEROSKEDASTICIY TEST (prob. of Chi-sq)</b>				
	<b>EG-FD</b>		<b>EG-FD-TO</b>	
	<b>1998Q1 - 2013Q2</b>	<b>1998Q1 - 2008Q3</b>	<b>1998Q1 - 2013Q2</b>	<b>1998Q1 - 2008Q3</b>
1	0.4425	0.0184	0.0016	0.3643
2	0.1382	0.7771	0.0051	0.7286
3	0.1527	0.6766	0.0750	0.7457
4	0.3635	0.6488	0.6195	Positive or non-negative argument to function expected
5	0.0332	0.2564	0.0446	0.2876
6	0.2322	0.0152	0.2166	0.2328
7	0.2248	0.3312	0.3124	0.3642
8	0.3656	0.1160	0.0157	0.4031
9	0.3627	0.1367	0.0104	0.3865
10	0.3087	0.3101	0.3061	0.5324
11	0.8810	0.3928	0.3990	0.6839
12	0.1841	0.5160	0.0031	0.4195
13	0.7164	0.9837	0.3107	0.9668

Results from the residual normality test are not very satisfactory. The null hypothesis is that the residuals follow a normal distribution. We reject the null hypothesis if the p-value of the Jarque-Bera statistics is lower than the confidence interval of 5%. In Table 41, we have shaded in grey those cases in which residuals are not normally distributed. The non-normality of the residuals may be considered a common problem given the relatively short time series considered in this study, and the presence of structural breaks which might characterize these time series, as it is usual in emerging /developing countries.

Table 41. Diagnostic test: residual normality test

<b>RESIDUAL NORMALITY TEST</b>				
	<b>EG-FD</b>		<b>EG-FD-TO</b>	
	<b>1998Q1 - 2013Q2</b>	<b>1998Q1 - 2008Q3</b>	<b>1998Q1 - 2013Q2</b>	<b>1998Q1 2008Q3</b>
1	0.0001	0.7236	0.9387	0.0356
2	0.0017	0.0005	0.0113	0.2637
3	0.1283	0.0331	0.8645	0.4227
4	0.8678	0.7519	0.7456	0.9116
5	0.8991	0.9107	0.4773	0.9284
6	0.8552	0.9522	0.8575	0.8771
7	0.0039	0.7800	0.1819	0.8986
8	0.0648	0.0261	0.0961	0.2747

9	0.1277	0.0978	0.3189	0.4859
10	0.0000	0.0462	0.0000	0.0015
11	0.0000	0.8446	0.0000	0.4481
12	0.0000	0.0000	0.0014	0.0005
13	0.8490	0.5883	0.7044	0.4379
Null Hypothesis: residuals are multivariate normal; We reject the null hypothesis at 5% level.				

## THESIS CONCLUSIONS AND FINAL REMARKS

The main objective of this thesis was to examine the short and long run causality dynamics between: financial development and economic growth; financial development, economic growth and trade openness, within a multivariate VAR and VECM framework in Albania over the period 1998Q1 – 2013Q2. Since there's not a unique best definition of financial system and to assure the robustness of the empirical results we used a total of 13 measures of financial development: FD1 (domestic credit/GDP), FD2 (credit to private sector/GDP), FD3 (total credit excl. credit to government/GDP), FD4 (M1/GDP), FD5 (M2/GDP), FD6 (M3/GDP) FD7 (total deposits/GDP), FD8 (credit to private sector/total deposits), FD9 (total credit excl. credit to government/total deposits), FD10 (M3/M1), FD11 (M3/monetary base), FD12 (credit to private sector/domestic credit), FD13 (interest rate spread). Economic growth was proxied by the quarterly real GDP data. Trade openness was determined as the ratio between the sum of imports and exports to nominal GDP. The use of quarterly data allows highlighting important interactions which cannot be evidenced in low frequency data and because of the short time series. The empirical analysis first step regarded testing for the order of integration of the time series employing well known tests: Augmented Dickey Fuller (ADF) and Phillips Perron (PP) unit root test. Judgments based on graphical inspection and results from the ADF-test and PP-Test show that all the variables under consideration are not stationary at levels (1% and 5% confidence intervals), thus become stationary after first differencing. The next step concerned the cointegration analysis for those variables integrated of the same order. For those variables found cointegrated we explore the short and long run causality patterns in the VECM framework. For those variables integrated of order  $I(1)$  but not cointegrated, causality patterns will be explored in the VAR context. All assessments will be conducted in the full sample 1998Q1 – 2013Q2 and the pre-crisis sub-sample 1998Q1 – 2008Q3. In the case there are differences in the causality patterns assessed in the pre-crisis subsample and full sample we attribute them as to the financial crisis.

### *...on the long run causality*

Considering the entire sample, 1998Q1 – 2013Q2, we found evidence for seven cointegrating relationships between financial development and economic growth, in the cases when financial

development was proxied by FD1 (domestic credit/GDP), FD2 (credit to private sector/GDP), FD3 (total credit excl. credit to government/GDP), FD4 (M1/GDP), FD8 (credit to private sector/total deposits), FD9 (total credit excl. credit to government/total deposits) and FD12 (credit to private sector/domestic credit). Despite the proxy used for financial development, empirical evidence suggests for unidirectional causality between economic growth and financial development in the long run, with causality running from financial development to economic growth.

In the pre-crisis period, sample 1998Q1 – 2008Q3, we found out 5 cointegrating relationships between economic growth and financial development, when financial development is proxied by FD2 (credit to private sector/GDP) FD3 (total credit excl. credit to government/GDP), FD4 (M1/GDP), FD5 (M2/GDP) FD12 (credit to private sector/domestic credit). In the long run, economic growth and financial development present a positive relationship, with causality running from financial development to economic growth only in the cases when financial development is proxied by FD2 (credit to private sector/GDP) FD3 (total credit excl. credit to government/GDP) and FD12 (credit to private sector/domestic credit). In the other two cases, when financial development is proxied by monetary aggregates in terms of nominal GDP, FD4 (M1/GDP), FD5 (M2/GDP), no causality patterns were evidenced.

*Overall, in the bivariate case (finance and growth nexus), empirical evidence suggests for a positive long run relationship between finance and economic growth, clear unidirectional relationship between finance and growth, with causality running from financial development to economic growth. The global financial crisis seems to have not affected the causality direction in the finance and growth nexus, thus supporting the finance led growth hypothesis in the long run in the case of Albania.*

In the economic growth - financial development - trade openness nexus, full sample 1998Q1 – 2013Q2, the introduction of trade openness didn't alter the existing cointegrating relationships in the finance and growth nexus. Thus, in the long run, financial development and trade openness are found to be positively related to economic growth. In the cases when financial development is proxied by FD1 (domestic credit/GDP), FD2 (credit to private sector/GDP), FD8 (credit to private sector/total deposits), FD9 (total credit excl. credit to government/domestic credit) we find evidence for causality running in simultaneously in two directions: from financial

development and trade openness to economic growth and from economic growth and financial development to trade openness. When financial development is proxied by FD3 (total credit excl. credit to government/GDP) and FD11 (M3/monetary base) we find unidirectional causality running from financial development and trade openness to economic growth. In one case, when financial development is proxied by FD4 (M1/GDP) we find evidence for the growth led hypothesis, but coefficients despite presenting the correct sign and being statistically significant are small in magnitude. In the case of financial development proxied by FD12 (credit to private sector/domestic credit) we find evidence for causality running contemporarily in all directions: from financial development and trade openness to economic growth, from economic growth and trade openness to financial development and from economic growth and financial development to trade openness. In all cases, we find strong empirical support for economic growth and financial development to cause trade openness.

Considering the pre-crisis period, 1998Q1-2013Q2, we find cointegrating relationships in five cases when financial development is proxied by FD5 (M2/GDP), FD7 (total deposits/GDP), FD11 (M3/monetary base), FD12 (credit to private sector/domestic credit) and FD13 (interest rate spread). Among them, no causality patterns can be evidenced in the case of FD5 and FD13. In the other cases, we found evidence for causality running from financial development and trade openness to economic growth.

*Overall, in the finance-growth nexus, empirical evidence suggests for a positive long run relationship between finance, growth and trade, with causality direction depending on the proxy used for financial development. When the pre-crisis sample is considered, we find evidence for causality running from financial development and trade openness to economic growth. The global financial crisis seems to have affected somewhat the causality direction in the finance-growth-trade nexus, which has become sensible to the proxy used for financial development.*

#### ***...on the short run causality***

In the finance growth nexus over the full sample period, 1998Q1 - 2013Q2, we find empirical support for the unidirectional-reverse causality running from economic growth to financial development (10 out of 13 proxies of financial development). Bidirectional causality between finance and growth is found only in one case when financial development is proxied by FD4

(M1/GDP). No short term causality was evidenced in the case financial development is proxied by FD12 (credit to private sector/domestic credit) and FD13 (interest rate spread).

When the pre-crisis sub-sample is considered, 1998Q1 – 2008Q3, we find more evidence on bi-directional causality between financial development and economic growth (5 out of 13 proxies of financial development). Also, we find evidence of reverse unidirectional causality from economic growth to financial development (for proxies FD1 (domestic credit/GDP), FD5 (M2/GDP) and FD11 (M3/monetary base) and from financial development to economic growth (FD2 (credit to private sector/GDP), FD3 (total credit excl. credit to government/GDP) and FD9 (total credit excl. credit to government/total deposits)).

*Overall, in the bivariate case (finance and growth nexus over the full sample), empirical evidence suggests for a clear unidirectional relationship between finance and growth, with causality mostly running from economic growth to financial development. When we consider the pre-crisis subsample results are mixed, depending on the proxy used for financial development. The global financial crisis seems to have affected the causality direction in the finance and growth nexus, thus supporting the growth led finance the short run in the case of Albania.*

In the case we add trade openness in the finance and growth nexus, short run causality patterns over the full sample period 1998Q1 – 2013Q2 are mixed, sensible to the proxy used for financial development. To highlight the new causality channel running from economic growth and financial development to trade openness. The same patterns of causality are observed when the pre-crisis subsample was considered.

*First, on the short run causality over the pre-crisis period, first we observed that there is more evidence on bi-directional causality between finance and growth. Second, empirical evidence shows mixed results depending on the proxy used to measure financial development. Third, the outbreak of the financial crisis seems to have affected considerably the causality patterns among variables. In the full sample from 1998Q1 – 2013Q2 we find strong evidence for short run causality running from economic growth to financial development. The same results are confirmed when trade openness is taken into account.*

The causality patterns in the short and long run in both, finance-growth nexus, finance-growth-trade openness nexus present important policy implications. Albania is a small country, trying to

catch up economically with European Union countries and fostering EU integration in the near future.

*...some policy implications*

The results on short term causality seem perfectly in line with the economic growth patterns of Albania. The reverse unidirectional causality in the short run is frequent in developing countries. Albania presents specific economic, political and institutional characteristics and has followed its own transition path toward an open market economy. Since the beginning of the 90s, the country pursued a somehow chaotic multidimensional growth policy leading to the current economic model. Nourished by an accelerated internal housing demand, economic boom in Albania has been strongly driven and determined by the construction sector of the economy. Financial development came as passive response to the economic growth, which induced participation in financial market. At the time, Albanian financial system, mostly the banking system, responded promptly to the demand for financial resources from the private (and public) sector of the economy. At the first sign of deceleration in the construction sector (mainly in the capital Tirana) banks stopped crediting the sector and first fragilities of both sectors emerged. Currently banks are finding it difficult to reorient their financial resources to the most productive sectors of the economy, may be because there's still high uncertainty related to which are the most competitive ones! New sources of growth should be exploited or the existing ones should be mixed in an innovative and efficient way in order to boost exports of the country. New growth enhancing policies should be introduced in order to promote investments and specifically those related to foreign direct investment attraction.

Since the empirical evidence suggested that in the long run causality runs from financial development to economic growth, it is recommended the acceleration of policies stimulating financial sector development. Similarly to other developing countries, stock markets play a minor role and financial sector is dominated by the banking system. Thus, improvements in the financial sector especially banking industry, in terms of more attractive and innovative products aiming savings mobilization, specialization, economies of scale and cost efficiency, monitoring of loans and risk management etc. should be stimulated. At the same time, for long run sustainable growth, alongside the banking sector development, other segments of the financial system should be stimulated in the long run. Stock market, despite being considered prohibitive

at the current conditions, in the long run would give an important stimulus to the private sector through financing diversification. Also, it would be important and effective the entrance of other non-institutional lenders such as venture capitalist, business angels etc. and further development of microfinance institutions (serving micro businesses, usually left out formal financial markets). Another measure important both in short and long term is the reduction of the current high level of informality in the country, which inhibits financial development and in turn economic growth.



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