INSTITUTIONS, FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH

Deniz GÜVERCİN[1]
Adem GÖK[2][*]

Abstract

This paper contributes to the literature by examining the impact of rule of law and regulatory quality on economic growth through their impact on the stock market development and banking development. In the study, panel vector autoregressive model is employed for the EU-15 countries over the period of 1996-2012 in order to account the endogenous interrelations among these variables. Estimation results indicate that both indicators of institutions increase banking development as well as stock market development. Additionally, the findings indicate that banking development complements with stock market development. It is found that capital market development increases income per capita whereas banking development decreases income per capita.

Keywords: Rule of Law, Regulatory Quality, Banking Development, Stock Market Development.

JEL Codes: G00, G20, O16.

KURUMLAR, FİNANSAL GELİŞME VE EKONOMİK BÜYÜME

Öz

Bu makale hukukun üstünlüğü ve düzenleyici kalitenin menkul kıymetler borsasının gelişimi ve bankacılık sektörü gelişimi üzerinden ekonomik büyümeye etkisini analiz ederek literatüre katkı sağlamaktadır. Değişkenler arasındaki karşılıklı içsel ilişkileri açıklamak için AB-15 ülkelerini 1996-2012 zaman dilimi arasında ele alarak panel vektör özbağlanımlı model kullanılmıştır. Tahmin sonuçları, kurumların her iki göstergesinin de menkul kıymetler borsasının gelişimi yanında bankacılık sektörü gelişimini arttırdığını göstermektedir. Ek olarak, bulgular menkul kıymetler borsasının gelişimi ile bankacılık sektörü gelişimi arasında tamamlayıcılık ilişkisi olduğunu göstermektedir. Menkul kıymetler borsasının gelişimi kişi başına düşen geliri artırırken, bankacılık sektörü gelişimi kişi başına düşen geliri azaltmaktadır.

Anahtar Kelimeler: Hukukun Üstünlüğü, Düzenleyici Kalite, Bankacılık Sektörü Gelişimi, Menkul Kıymetler Borsasının Gelişimi.

JEL Kodları: G00, G20, O16.

---

[1]Dr. Öğr. Üyesi, İstanbul Arel Üniversitesi, Uluslararası Ticaret ve Finans Bölümü ORCID 0000-0001-6158-3877
[2] Dr. Öğr. Üyesi, Kırklareli Üniversitesi, Kayalı Kampüsü, İİBF, Oda No:324, ORCID 0000-0002-3786-2507
[*] **Sorumlu Yazar** (Corresponding Author): adem.gok@klu.edu.tr
 Başvuru Tarihi (Received): 21.11.2018 **Kabul Tarihi** (Accepted): 21.04.2019

Introduction, Theory and the Literature Review

There are several studies analyzing the effect of rule of law on financial development and the effect of financial development on economic growth. La Porta et al. (1998) argues that the origin of a country's legal system influences economic and financial development. King and Levine (1993), Levine and Zervos (1998), Demirguc-Kunt and Maksimovic (1998), Saad (2014) and Kyophilavong et al. (2016) found evidence of a positive significant effect of financial development on economic growth. However, most of the studies that examine the effect of financial development on economic growth do not take account of the rule of law. Therefore, the study fills this gap in the literature by providing panel VAR analysis between legal system, financial development and economic growth.

Financial development leads to economic growth by increasing efficiency of capital accumulation and savings rate (Goldsmith, 1969; Levine, 1997, Greenwood and Jovanovic, 1990). De Gregorio (1993), Rajan and Zingales, (1996), and Galor and Zeira (1993) argue that developed financial market would provide resources for small scale producers, poor and middle class people to achieve the necessary physical and human capital to enter the markets. Acemoglu and Zilibotti (1997) and Levine (1997) argue that without well-developed financial markets, large scale, long run and high risky (technological) investments would not be undertaken, which would result in underdeveloped economy. On the other hand, Demetriades and Luintel (1996), Arestis and Demetriades (1997), and Shan et al. (2001) found that economic growth causes financial development.

There are several studies in literature examining the effect of rule of law on economic growth. Acemoglu et al. (2001; 2005) argue that sustained economic growth would follow in the legal environment, where the contracts are enforced and property rights are protected. Scultz and Wiengast (2003), Acemoglu et al. (2005), and Cass (2001) emphasize that institutional checks and balances on the government expropriation that are necessary to have viable rule of law improves the economic performance of the country. Acemoglu et al. (2005) emphasize that independent judiciary and civil liberties as well as checks on government expropriation prompt investment and economic growth.

Besides, several studies found that the causality runs from economic growth to complexity of contract enforcement and contractual arrangements in legal texts. Dam (2006) argues that more independent legal institutions might emerge with rise in income. He emphasizes that rise in resources to be used for the judicial processes, and to increase the salaries of judges might decrease the political pressures and bribes that would lead to increase in economic growth. Rigobon and Rodrik (2005) argue that economic growth produces better institutions. In particular, resources to be used for renovation of the juridical system such as installation of technological endowments to increase the efficiency of forensic laboratory or increasing the judges' salaries (Dam, 2006) would improve the enforcement of law.

The legal system would exert an influence on the development of financial development. Levine (1998) reports that countries with sound legal systems ensuring the enforcement of contracts have more developed financial markets. Beck and Levine (2003) argue that savers are more willing to provide and mobilize their savings if the rule of law enforces private property rights, private contractual arrangements, and legal rights of investors. Glaeser (2001) argue that the sophisticated and complex contracts enacted through developed financial institutions and the set of rules and regulatory framework that is compatible with the technical details of these contracts would protect the investors' rights against the financial frauds and thefts.

If the capital markets are not developed due to some frictions in financial markets such as the costs of financial distress, asymmetric information, and tax advantages, firms use internal cash flows to grow (Musso and Schiavo, 2008). However, if there is sufficient level of legal protection for

investors and outside stockholders, then the size of external finance would be larger which induces more developed financial markets. Additionally, legal framework and level of protection for investors, particularly protection of outside stockholders' rights against insiders affect the size of external finance (La Porta et al., 2013).

Using data for 49 countries, La Porta et al. (1998) argue that the extent of the rights of shareholders and creditors is determined by legal origin. They report that the rule of law, legal origin and shareholders' and creditors' rights affect stock market capitalization and the amount of bank credits used domestically by private sector positively. Johnson et al. (2002), by using data from survey performed over small manufacturing firms in five transition countries, argue that firms in countries where property rights are enforced reinvest the profits, whereas in countries where there is not legal protection over property rights, firms are less tended to reinvest the profits.

Glaeser et al. (2001) contrasted capital market regulations for securities in Czech Republic and Poland and concluded that the stock market in Poland is more developed than Czech Republic since Poland has stronger capital market regulations. By using rule of law index, European Bankk for Reconstruction and Development (Banking Environment and Performance Survey) index and enforcement index, Pistor et al. (2000) conducted empirical analyses for 20 transition economies. They report that enforcement of law, but not legal text, affects both banking and stock market development positively.

The causality between financial development and the rule of law might run from financial development to the rule of law. As the financial markets develop, laws pertaining to the rights of investors and creditors, securities law, bankruptcy law might emerge and become more complex.

Financial institutions might differ according to their impact on economic growth. The stock market would increase the speed of transaction and decrease the cost of transaction leading to portfolios with greater cross sectional risk sharing and efficient allocation of funds. However, increased liquidity, price volatility, asset bubbles, and foreign exchange rate volatility might reduce economic growth (Arestis et al. 2001; Akyuz, 1993; Singh, 1997). Stiglitz (1985) argues that banks are better at addressing the principal agent problems, thus, stock markets development together with low banking development would undermine economic growth by reducing the efficient allocation of funds and the profitable investment projects. Also, stock market development together with low banking development might undermine economic growth due to interactions between foreign exchange market and stock market.

Levine and Zervos (1998), Beck and Levine (2014) reported positive significant effect of both stock market and banking development on economic growth. But, Naceur and Ghazouani (2007) reported that banking development negatively affects economic growth after controlling stock market development. By using data for 16 transition countries over the 1991-2011 period, Petkovski and Kjosevski (2014) found that bank credit to private sector has negative significant effect on economic growth rate. By using data for 27 EU member states over the period of 1998-2011, Creel et al (2015) found that credit to private sector has negative significant effect on economic growth.

The study by accounting all possible connections among these variables seek to find the direct and indirect paths of causations and channels running from development of financial institutions to the economic growth. The paper contributes by bringing further evidence that rule of law does escalate the effect of financial development on economic growth. Also, one other innovation of the study is using the rule of law and regulatory quality variables to represent the quality of legal system where the rule of law represents the legal text, and regulatory quality represents the enforcement (quality) of legal text in the country. Moreover, by the endogenous nature of interrelation among

these variables, Panel VAR methodology is employed to account this interrelation which has not been performed in the relevant literature.

The structure of the paper is as follows. The next section is the empirical analysis section introducing the data, the empirical methodology and the empirical results. The third section is the conclusion section.

2. Empirical Analysis

2.1. Data and Variables

The analysis covers EU-15 countries over the period 1996-2012. The EU-15 countries are selected since they are more stable and more homogenous group than other country classifications. Time span of the study is selected due to the data availability. The variables utilized in the study are as follows;

lngdppc: It represents the natural logarithm of GDP per capita, PPP (constant 2011 international $), which is taken from The World Bank (2018a).

lnstock: It is constructed as the natural logarithm of stock market development index. Stock market development index is the average of three indices taken from Federal Reserve Bank of St. Louis (2018) as follows;

    i.   Stock Market Capitalization to GDP, Percent, Annual, Not Seasonally Adjusted
    ii.   Stock Market Total Value Traded to GDP, Percent, Annual, Not Seasonally Adjusted
    iii.   Stock Market Turnover Ratio (Value Traded/Capitalization), Percent, Annual, Not Seasonally Adjusted

These three proxies are used in the literature to measure stock market development (Levine and Zevros, 1998; Rousseau and Wachtel, 2000; Beck and Levine, 2004). Instead of using just one index, the three indices are averaged to have more accurate proxy of the stock market development.

lnbank: It is constructed as the natural logarithm of banking development index. Banking development index is the average of two indices taken from Federal Reserve Bank of St. Louis (2018) as follows;

    i.   Liquid Liabilities to GDP for Denmark, Percent, Annual, Not Seasonally Adjusted
    ii.   Private Credit by Deposit Money Banks and Other Financial Institutions to GDP for Italy, Percent, Annual, Not Seasonally Adjusted

These two proxies are used in the literature to measure banking development (Levine and Zevros, 1998; Beck and Levine, 2004). Instead of using just one index, we averaged two indices for more accurate proxy of banking development.

rol: It represents the governance index of rule of law, which is taken from The World Bank (2018b).

regq: It represents the governance index of regulatory quality, which is taken from The World Bank (2018b).

Table 1: *Summary Statistics*

Variable	Obs	Mean	Std. Dev	Min	Max
lngdppc	255	10.548	0.273	9.987	11.491
lnstock	255	4.043	0.563	2.567	5.346
lnbank	255	4.514	0.358	3.747	5.515
regq	255	2.438	0.366	1.496	3.098
rol	255	2.523	0.405	1.387	3.013

2.2. Panel VAR Model

Since all three variables in each of five models are endogenous, the panel VAR model is used for estimation. The optimal lag-length for each of five panel VAR model is tested for maximum lag length of four and it is found that the optimal lag length is one for each model (Love and Zicchino, 2006). Hence, it is specified a first order panel VAR model representing all five models as follows;

$$y_{it} = \varGamma_0 + \varGamma_1 y_{it-1} + f_i + d_{c,t} + e_t \tag{1}$$

where y_{it} is a three-variable vector which includes rol, lnstock and lngdppc in first model; regq, lnstock and lngdppc in second model; rol, lnbank and lngdppc in third model; regq, lnbank and lngdppc in fourth model and lnstock, lnbank and lngdppc in last model.

The fixed effects is introduced by f_i to allow for individual heterogeneity for each country in the panel in order not to impose the restriction that the underlying structure for each cross-sectional unit is the same (Love and Zicchino, 2006).

It is used lagged regressors as instruments to estimate the coefficients with System Generalized Method of Moments (Love and Zicchino, 2006).

In order to analyze the impulse-response functions, their confidence intervals are estimated with Monte Carlo simulations (Love and Zicchino, 2006).

Variance decomposition shows the percentage of variation in one variable that is explained by the shock to another variable, accumulated over time. We report the total effect accumulated over the 10 years by variance decomposition (Love and Zicchino, 2006).

2.3. Stationarity Analysis

The stationarity of the variables is tested with Levin-Lin-Chu unit-root test. According to the unit-root test results in Table 2, all variables are found stationary at the level.

Table 2: *Levin-Lin-Chu Unit-Root Test Results*

| Variables | Level | | Result |
	Constant	Constant and Trend	
lngdppc	-5.491***	-2.100**	I(0)
lnstock	-4.791***	-5.765***	I(0)
lnbank	-3.558***	-4.869***	I(0)
regq	-2.970***	-2.505***	I(0)
rol	-2.844***	-4.378***	I(0)

Notes: The numbers are adjusted t*. ***, ** and * denote significance levels at 1%, 5% and 10% respectively.

2.4. Panel VAR Estimation Results

2.4.1. Rule of Law, Stock Market Development and Income per Capita

The Granger causality test results, illustrated in Table 3, justify using Panel VAR technique in the sense that all variables are endogenous and there exists two-way relationship between any two of them. Specifically, rule of law (rol) granger causes stock market development (lnstock) and income per capita (lngdppc) and stock market development (lnstock) granger cause income per capita (lngdppc).

Table 3: *Granger Causality Test Results*

	rol	lnstock	lngdppc
rol		0.00	0.09
lnstock	0.00		0.00
lngdppc	0.03	0.04	

Notes: The numbers are the Prob > chi2 values. Null hypothesis is that the column variable does not Granger-cause raw variable.

According to the results presented in Table 4, panel VAR satisfies the stability condition since the stability test indicates that all the eigenvalues lie inside the unit circle.

**Table 4:** *Panel VAR Stability Test Results*

| Eigenvalue | | Modulus |
Real	Imaginary	
0.842	0	0.842
0.692	-0.296	0.753
0.692	0.296	0.753

According to the impulse response functions in Figure 1, one standard deviation shock given to rule of law (rol) has a positive significant effect on stock market development (lnstock) and has no significant effect on income per capita (lngdppc).

One standard deviation shock given to stock market development (lnstock) has positive significant effect on income per capita (lngdppc). Hence, stock market development leads to economic growth. Since rule of law has no direct effect on income per capita, rule of law has indirect positive significant effect on income per capita through stock market development. The test results confirms and are in line with the findings of prior studies from (La Porta et al.1998; Glaeser et al, 2001; Demirguc-Kunt & Maksimovic 1998, 2005). Findings indicating the negative impact of GDP per capita on the stock market development contradicts with the findings in the literature (Demetriades and Hussein, 1996; Greenwood and Smith, 1997). However, Enisan and Olufisayo

(2009) show that there is a weak evidence that the economic growth induces stock market development for the Nigeria. Moreover, Hoque et al. (2017) argues that the short term capital movements for the country implementing the export oriented growth strategy might lead to appreciation of the national currency leading to profit loss and the poor performing stocks of firms leading to underdevelopment of the stock market which would explain the findings above for Turkey.

Figure 1: *Impulse Response Functions*
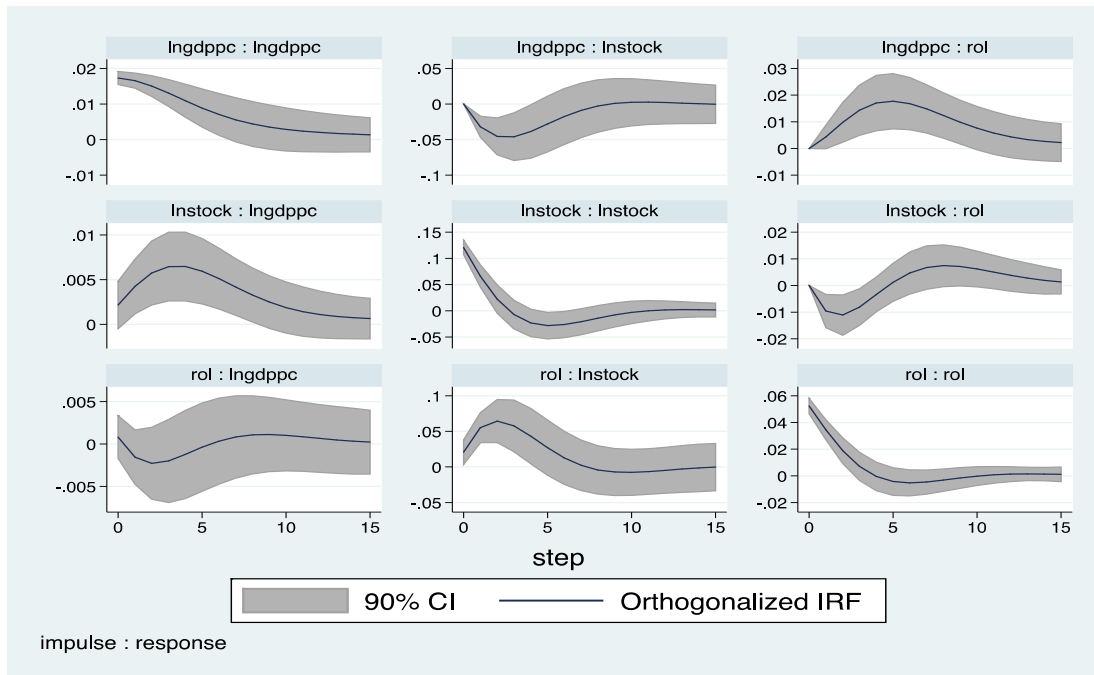
According to variance decomposition at a horizon of ten years in Table 5, income per capita (lngdppc) forecast error variance is attributed mostly to its own shock by % 83,6. Stock market development (lnstock) explains % 15,3 of total variation in income per capita (lngdppc). Rule of law (rol) explains % 31,5 of total variation in stock market development (lnstock).

Table 5: *Variance Decompositions*

	rol	lnstock	lngdppc
rol	0.673	0.071	0.256
lnstock	0.315	0.505	0.180
lngdppc	0.011	0.153	0.836

Notes: Percent of variation in the row variable (10 periods ahead) explained by column variable.

2.4.2. Regulatory Quality, Stock Market Development and Income per Capita

The Granger causality test results, shown in Table 6, justify using Panel VAR technique in the sense that all variables are endogenous and there exists two-way relationship between any two of them except the causation from income per capita (lngdppc) to regulatory quality (regq). Specifically, regulatory quality (regq) granger causes stock market development (lnstock), and stock market development (lnstock) granger causes income per capita (lngdppc) and to regulatory quality (regq).

Table 6: *Granger Causality Test Results*

|	regq	lnstock	lngdppc
regq		0.00	0.42
lnstock	0.00		0.00
lngdppc	0.00	0.00	

Notes: The numbers are the Prob > chi2 values. Null hypothesis is that the column variable does not Granger-cause raw variable.

Based on the results presented in Table 7, panel VAR satisfies the stability condition since the stability test indicates that all the eigenvalues lie inside the unit circle.

Table 7: *Panel VAR Stability*

Eigenvalue		Modulus
Real	**Imaginary**	
0.931	0.106	0.937
0.931	-0.106	0.937
0.659	0	0.659

According to the impulse response functions in Figure 2, one standard deviation shock given to regulatory quality (regq) has a positive significant effect on stock market development (lnstock) and has positive significant effect on income per capita (lngdppc). Therefore, the enforcement of the legal text contributes to the financial and economic development. One standard deviation shock given to stock market development (lnstock) has positive significant effect on income per capita (lngdppc). Hence stock market development leads to economic growth. Moreover, both income per capita and stock market development contributes positively to the regulatory quality whereas the economic growth decreases the stock market development. The result suggests that the increase in regulatory quality would generate positive feedbacks to itself through the economic growth and stock market channels.

Figure 2: *Impulse Response Function*
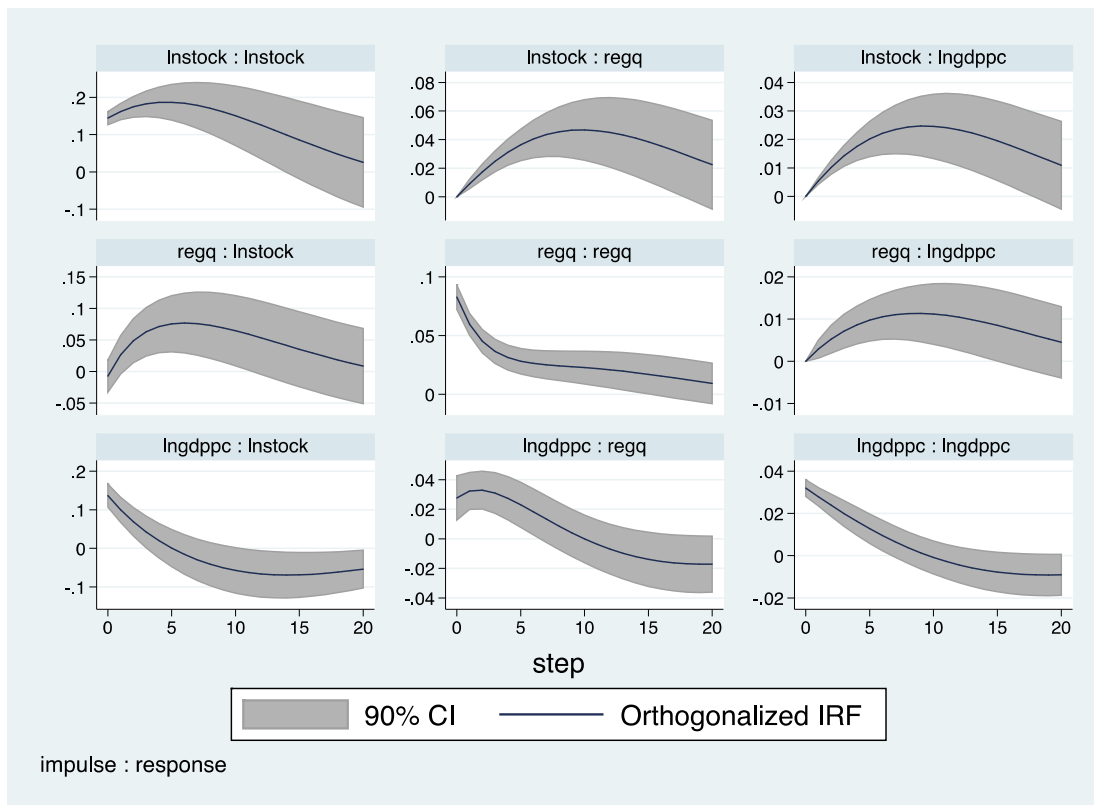
According to variance decomposition at a horizon of ten years in Table 4, stock market development (lnstock) explains % 44,6 of total variation in income per capita (lngdppc). Regulatory quality (regq) explains %10,3 of total variation in stock market development (lnstock).

Table 9: *Variance Decompositions*

	regq	lnstock	lngdppc
regq	0.517	0.318	0.165
lnstock	0.103	0.790	0.107
lngdppc	0.101	0.446	0.453

Notes: Percent of variation in the row variable (10 periods ahead) explained by column variable.

Based on the results above, regulatory quality increases stock market development, which leads to economic growth. Therefore, both legal text and its enforcement quality have positive significant effect on stock market development. Enforcement of the rule of law against expropriation of investors' rights, and expropriation of outside stockholders' rights would increase the stock market development, which, would lead to the economic growth. These findings comply with the findings in the literature on the legal system and financial development (Demirguc-Kunt & Maksimovic, 1998; 2005)

2.4.3. Rule of Law, Banking Development and Income per Capita

The results from Granger causality test in Table 9 justify using Panel VAR technique in the sense that all variables are endogenous and there exists two-way relationship between any two of them except causation from banking development (lnbank) to rule of law (rol). Specifically rule of law

(rol) granger causes banking development (lnbank) and income per capita (lngdppc), and banking development (lnbank) granger causes income per capita (lngdppc) .

Table 10: *Granger Causality Test*

	rol	lnbank	lngdppc
rol		0.88	0.00
lnbank	0.00		0.00
lngdppc	0.06	0.02	

Notes: The numbers are the Prob > chi2 values. Null hypothesis is that the column variable does not Granger-cause raw variable.

According to the results in Table 10, panel VAR satisfies the stability condition since the stability test indicates that all the eigenvalues lie inside the unit circle.

Table 11: *Panel VAR Stability*

Eigenvalue		Modulus
Real	**Imaginary**	
0.867	0.023	0.867
0.867	-0.023	0.867
0.382	0	0.382

According to impulse response functions in Figure 3, one standard deviation shock given to rule of law (rol) has a positive significant effect on banking development (lnbank) and has no significant effect on income per capita (lngdppc). One standard deviation shock given to banking development (lnbank) has negative significant effect on income per capita (lngdppc). Hence banking development decreases income per capita, so it does not lead to economic growth. Moreover, there is bi-directional relation between rule of law and banking development. Particularly, the rule of law improves banking development whereas banking development decreases the rule of law. These results comply with the results for the stock market development that the rule of law contributes to the financial development whereas the financial development worsens it.

Figure 3: *Impulse Response Function*
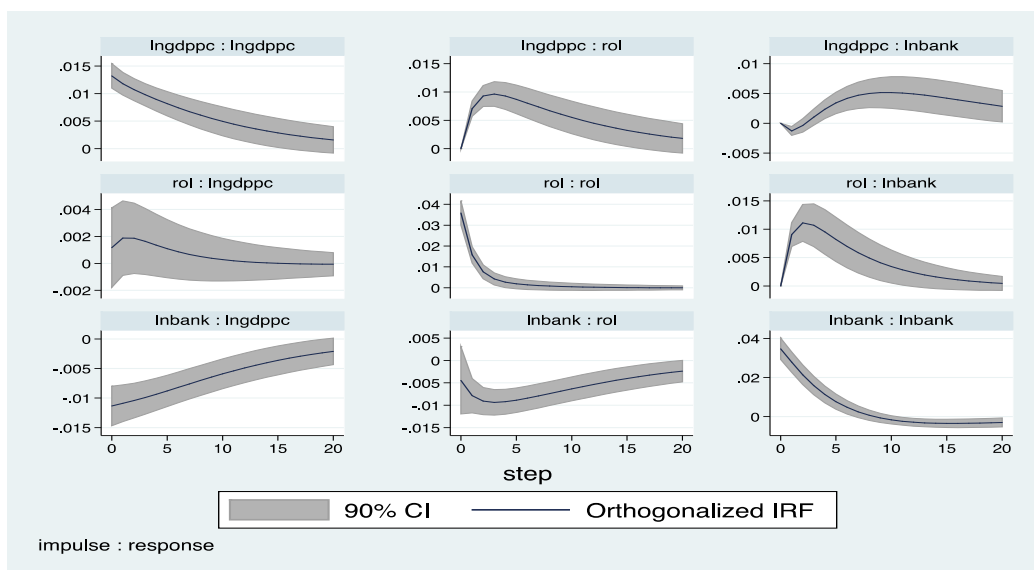
According to variance decomposition at a horizon of ten years in Table 11, banking development (lnbank) explains 49,6 % of total variation in income per capita (lngdppc). Rule of law (rol) explains 16,3 % of total variation in banking development (lnbank).

Table 12: *Variance Decomposition*

	rol	lnbank	lngdppc
rol	0.567	0.227	0.206
lnbank	0.166	0.803	0.031
lngdppc	0.009	0.494	0.497

Notes: Percent of variation in the row variable (10 periods ahead) explained by column variable.

2.4.4. Regulatory Quality, Banking Development and Income per Capita

Granger causality test results in Table 7 justify using Panel VAR technique in the sense that all variables are endogenous and there exists two-way relationship between any two of them. Specifically, regulatory quality (regq) granger causes banking development (lnbank) and income per capita (lngdppc), and banking development (lnbank) granger causes income per capita (lngdppc).

Table 13: *Granger Causality Test*

	regq	lnbank	lngdppc
regq		0.00	0.00
lnbank	0.00		0.00
lngdppc	0.00	0.00	

Notes: The numbers are the Prob > chi2 values. Null hypothesis is that the column variable does not Granger-cause raw variable.

According to the results in Table 13, panel VAR satisfies the stability condition since the stability test indicates that all the eigenvalues lie inside the unit circle.

Table 14: *Panel VAR Stability*

Eigenvalue		Modulus
Real	**Imaginary**	
0.912	0	0.912
0.694	0	0.694
0.179	0	0.179

According to impulse response functions in Figure 4, one standard deviation shock given to regulatory quality (regq) has a positive significant effect on banking development (lnbank) and no significant effect on income per capita (lngdppc). One standard deviation shock given to banking development (lnbank) has a negative significant effect on income per capita (lngdppc). Hence banking development decreases income per capita, so it does not lead to economic growth which is same as in the case of the rule of law. Therefore, policies promoting the stock market development in expense of the banking sector development should be in place to stimulate economic growth.

Figure 4: *Impulse Response Function*
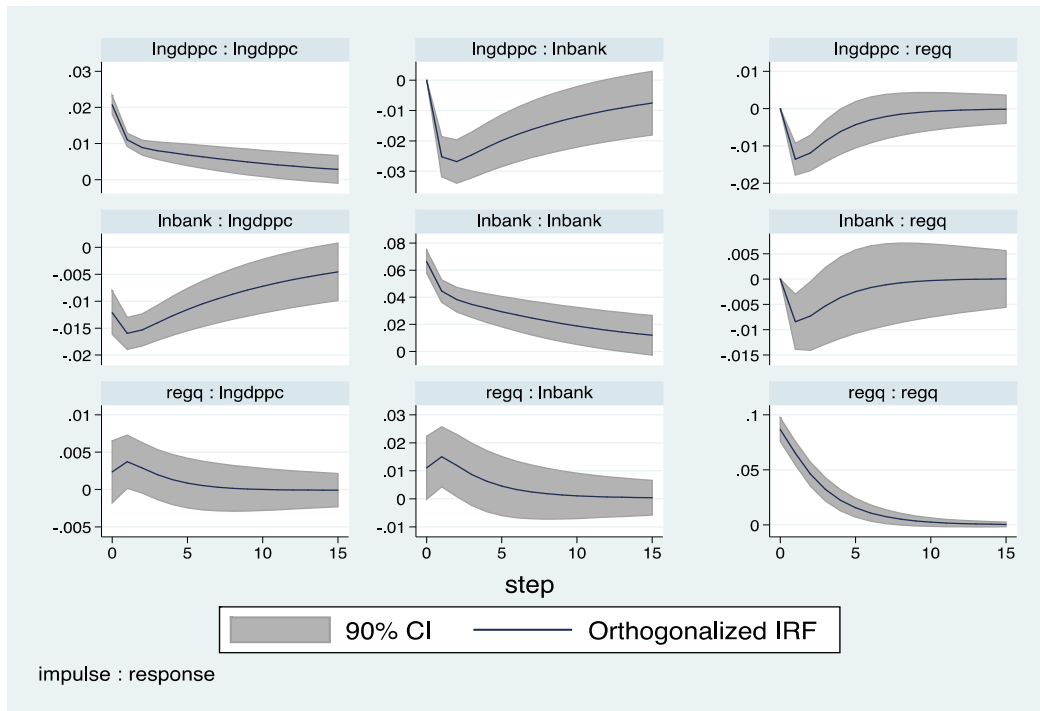
According to variance decomposition at a horizon of ten years in Table 14, banking development (lnbank) explains 60.6 % of total variation in income per capita (lngdppc). Regulatory quality (regq) explains 3.7 % of total variation in banking development (lnbank).

Table 15: *Variance Decomposition*

	regq	lnbank	lngdppc
regq	0.960	0.011	0.029
lnbank	0.037	0.746	0.217
lngdppc	0.014	0.606	0.380

Notes: Percent of variation in the row variable (10 periods ahead) explained by column variable.

2.4.5. Stock Market Development, Banking Development and Income per Capita

Granger causality test results in Table 7 justify using Panel VAR technique in the sense that all variables are endogenous and there exists two-way relationship between any two of them. Specifically, stock market development (lnstock) granger causes banking development (lnbank) and income per capita (lngdppc), and banking development (lnbank) granger cause stock market development (lnstock) and income per capita (lngdppc).

Table 16: *Granger Causality Test*

	lnstock	lnbank	lngdppc
lnstock		0.07	0.00
lnbank	0.00		0.00
lngdppc	0.10	0.01	

Notes: The numbers are the Prob > chi2 values. Null hypothesis is that the column variable does not Granger-cause raw variable.

According to the results in Table 16, panel VAR satisfies the stability condition since the stability test indicates that all the eigenvalues lie inside the unit circle.

Table 17: *Panel VAR Stability*

Eigenvalue		Modulus
Real	**Imaginary**	
0.770	0	0.770
0.646	-0.164	0.667
0.646	0.164	0.667

According to impulse response functions in Figure 5, one standard deviation shock given to stock market development (lnstock) has a positive significant effect on banking development (lnbank) and income per capita (lngdppc). One standard deviation shock given to banking development (lnbank) has positive significant effect on stock market development and has negative significant effect on income per capita (lngdppc). Hence stock market development increases income per capita while banking development decreases income per capita. There are bidirectional causal relations between banking development and stock market development in the sense that any improvement in one of these financial institutions contribute positively to another. However, as these financial institutions contribute to the economic growth in different directions the total effect on the economic growth would depend on the magnitude of these impacts.

On the other hand, the results show that even banking development decreases economic growth directly it increases it through its positive impact on stock market development. Therefore, any policy restricting the banking development should account the indirect effect over stock market development.

Figure 5: *Impulse Response Function*
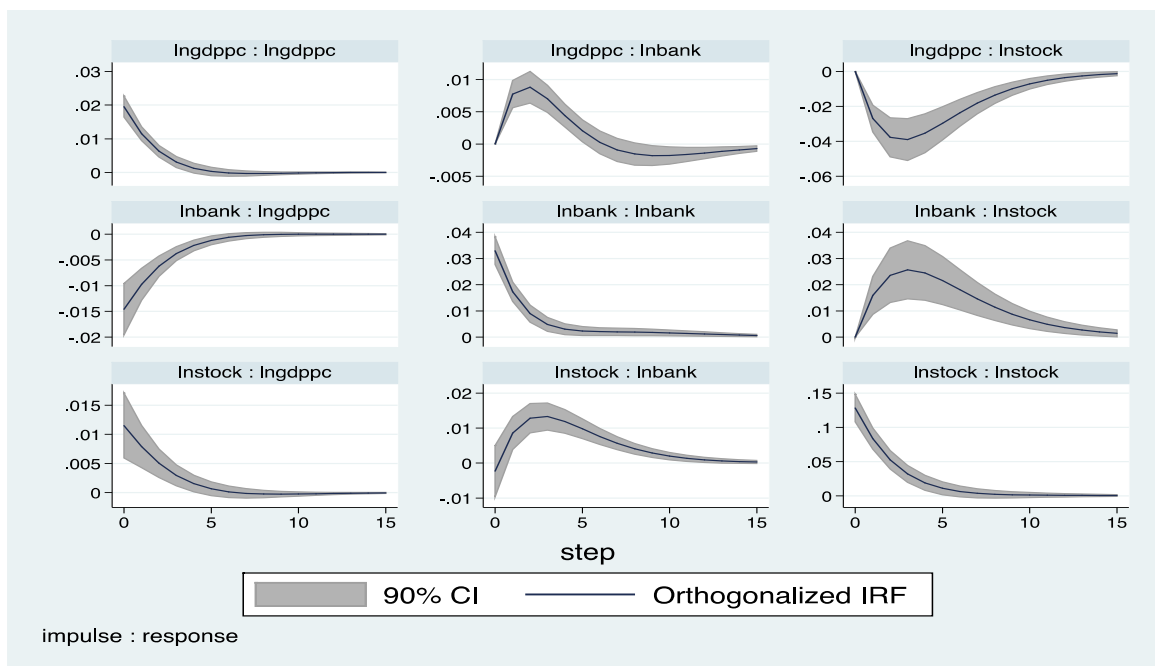
According to variance decomposition at a horizon of ten years in Table 17, stock market development (lnstock) explains 19.9 % of total variation in income per capita (lngdppc) and banking development (lnbank) explains 31.5 % of total variation in income per capita (lngdppc). While stock market development (lnstock) explains 30.8 % of total variation in banking development (lnbank), banking development (lnbank) explains 8.6 % of total variation in stock market development (lnstock).

Table 18: *Variance Decomposition*

	lnstock	lnbank	lngdppc
lnstock	0.731	0.086	0.183
lnbank	0.308	0.606	0.086
lngdppc	0.199	0.315	0.486

Notes: Percent of variation in the row variable (10 periods ahead) explained by column variable.

Moreover, income per capita decreases stock market development which has positive contribution on income per capita, and increases banking development which has negative contribution on income per capita. Additionally, increase in banking development which decreases income per capita increases stock market development which increases income per capita. Therefore, even there is not closed loop of interactions among these variables, the total impact of the increase in financial development on the economic growth depend on the magnitudes of these interactions.

3. Conclusion

There are several studies emphasizing the growth enhancing effect of financial development. However, these studies do not take account of the rule of law and its enforcement in examining the relationship between financial development and economic growth. By accounting the endogenous nature of interrelation among the variables, the study aims to examine the channels through which the stock market development and banking development influence economic growth.

The results indicate that rule of law and regulatory quality have positive significant impact on banking development and stock market development in accord with Dima et al. (2018). Results also suggest that income per capita positively affects rule of law whereas rule of law does not affect income per capita. The results confirm that rule of law is endogenously determined as emphasized by Rigobon and Rodrik (2005) and Dam (2006). However, it contradicts with the findings provided by several studies including Acemoglu et al. (2005) and Asoni (2008). The results may indicate that the rule of law exerts significant influence on economic growth through its impact on the financial development, particularly through stock market development channel.

Additionally, it is also found that banking development and stock market development are complements rather than substitutes which contradicts with the result provided by Allen and Gale (1997) and Boot and Thakor (1997). The result complies with Demirgüç-Kunt and Maksimovic (1996) arguing that stock market development generates results in higher debt-equity ratios, thus stimulates development of banking sector.

It is found that capital market development leads to economic growth whereas banking development leads to decrease in economic growth. Therefore, greater diversification of risks and efficient allocation of resources rendered by stock market development stimulates economic growth whereas banking sector development reduces it.

Moreover, income per capita decreases stock market development which has positive contribution on income per capita, and increases banking development which has negative contribution on income per capita. Additionally, increase in banking development which decreases income per capita increases stock market development which increases income per capita. Therefore, even there is no closed loop of interactions among these variables, the total impact of the increase in financial development on the economic growth depends on the magnitudes of these interactions.

Results on the relationship between the banking development and economic growth comply with the findings in the literature indicating that banking development decreases economic growth

(Creel et al., 2015; Bongini et al., 2017; Petkovski and Kjosevski, 2014; Naceur and Ghazouani, 2007).

Results on the relationship between banking development and economic growth also comply with threshold studies showing the switch in the relation between banking development and economic growth. Law and Singh (2014) and Cechetti and Kharraboubi (2012) argue that if the private sector credit to GDP ratio is above the threshold value, 90 % of GDP, the banking sector development negatively affects economic growth and if it is below that threshold value it increases economic growth.

Results on the relationship between stock market development and economic growth conflicts with the predictions some of the studies in the financial development literature (Arestis et al., 2001; Akyuz, 1993; Singh, 1997; Stiglitz, 1985). The positive effect of stock market development on economic growth is also supported by several studies (Jedida et al. 2014; Smaoui and Nechi, 2017).

The policy implication of these findings is that stock market development along with regulatory quality should be promoted to enhance economic growth. Moreover, as the rule of law which increases stock market development decreases by the stock market development, it should be improved along with stock market development.

References

Acemoglu, D., & Robinson, J. A. (2005). *Economic origins of dictatorship and democracy*. New York: Cambridge University Press.

Acemoglu, D., & Zilibotti, F. (1997). Was Prometheus unbound by chance? Risk, diversification, and growth. *Journal of Political Economy*, *105*(4), 709-751.

Acemoglu, D., Johnson, S., & Robinson, J. A. (2001). The colonial origins of comparative development: An empirical investigation. *American Economic Review*, *91*(5), 1369-1401.

Akyüz, Y. (1993). *Financial liberalization: The key issues* (UNCTAD Discussion Paper No. 56). Retrieved from http://www.southcentre.int/wp-content/uploads/2013/08/REP1_FInancial-Liberalization_EN.pdf.

Allen, F., Qian, J., & Qian, M. (2005). Law, finance, and economic growth in China. *Journal of financial economics*, *77*(1), 57-116.

Arestis, P., & Demetriades, P. (1997). Financial development and economic growth: Assessing the evidence. *The economic journal*, *107*(442), 783-799.

Arestis, P., Demetriades, P. O., & Luintel, K. B. (2001). Financial development and economic growth: The role of stock markets. *Journal of Money, Credit and Banking*, *33*(1), 16-41.

Asoni, A. (2008). Protection of property rights and growth as political equilibria. *The Journal of Economic Surveys, 22*(5), 953–987.

Beck, T., & Levine, R. (2004). Stock markets, banks, and growth: Panel evidence. *Journal of Banking & Finance*, *28*(3), 423-442.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2003). Law, endowments, and finance. *Journal of financial Economics*, *70*(2), 137-181.

Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2005). Financial and legal constraints to growth: Does firm size matter?. *The Journal of Finance*, *60*(1), 137-177.

Bongini, P., Iwanicz-Drozdowska, M., Smaga, P., & Witkowski, B. (2017). Financial development and economic growth: The role of foreign-owned banks in CESEE countries. *Sustainability*, *9*(3), 335.

Boot, A.W., & Thakor, A. V. (1997a). Financial system architecture. *Review of Financial Studies*, 10(3), 693-733

Calderon, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. *Journal of Development Economics,* 72, 321-334.

Cecchetti, S. G., & Kharroubi, E. (2012). *Reassessing the impact of finance on growth* (BIS Working Paper No. 381). Retrieved from SSRN website: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2117753.

Coffee Jr, J. C. (2001). The rise of dispersed ownership: The roles of law and the state in the separation of ownership and control. *Yale Law Journal,* 111, 1–82.

Creel, J., Hubert, P., & Labondance, F. (2015). Financial stability and economic performance. *Economic Modelling*, *48*, 25-40.

Dam, K. W. (2007). *The law-growth nexus: The rule of law and economic development.* Brookings Institution Press.

De Gregorio, J., & Guidotti, P. E. (1995). Financial development and economic growth. *World development*, *23*(3), 433-448.

Demetriades, P. O., & Luintel, K. B. (1996). Financial development, economic growth and banking sector controls: Evidence from India. *The Economic Journal*, *106*(435), 359-374.

Demirgüç-Kunt, A., & Maksimovic, V. (1998). Law, finance, and firm growth. *The Journal of Finance*, *53*(6), 2107-2137.

Demirgüç-Kunt, A., & Maksimovic, V. (1999). Institutions, financial markets, and firm debt maturity. *Journal of Financial Economics*, *54*(3), 295-336.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2003). Courts. *The Quarterly Journal of Economics*, *118*(2), 453-517.

Federal Reserve Bank of St. Louis (2018). Economic data. Retrieved May 6, 2018, from https://fred.stlouisfed.org/.

Galor, O., & Zeira, J. (1993). Income distribution and macroeconomics. *The Review of Economic Studies*, *60*(1), 35-52.

Glaeser, E., Johnson, S., & Shleifer, A. (2001). Coase versus the Coasians. *The Quarterly Journal of Economics*, *116*(3), 853-899.

Glaeser, E., Johnson, S., & Shleifer, A. (2001). Coase versus the Coasians. *The Quarterly Journal of Economics*, *116*(3), 853-899.

Goldsmith, R.W. (1969). *Financial structure and development.* New Haven, CT: Yale University Press.

Greenwood, J., & Smith, B. D. (1997). Financial markets in development, and the development of financial markets. *Journal of Economic Dynamics and Control*, *21*(1), 145-181.

Hoque, M. E., & Yakob, N. A. (2017). Revisiting stock market development and economic growth nexus: The moderating role of foreign capital inflows and exchange rates. *Cogent Economics & Finance*, *5*(1), 1-17.

Khoutem Ben, J., Boujelbène, T., & Helali, K. (2014). Financial development and economic growth: New evidence from Tunisia. *Journal of Policy Modeling, 36*(5), 883–898

Jensen, M. C., & Murphy, K. J. (1990). Performance pay and top-management incentives. *Journal of political economy*, *98*(2), 225-264.

King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics*, *108*(3), 717-737.

Kyophilavong, P., Uddin, G. S., & Shahbaz, M. (2016). The nexus between financial development and economic growth in Lao PDR. *Global Business Review, 17*(2), 303–317.

La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2013). Law and finance after a decade of research. In G. M. Constantinides, M. Harris, & R. M. Stulz (Eds.), *Handbook of the economics of finance* (Vol. 2, pp. 425-491). North Holland: Elsevier.

Law, S. H., & Singh, N. (2014). Does too much finance harm economic growth?. *Journal of Banking & Finance*, *41*, 36-44.

Levine, R. (1997). Financial development and economic growth: Views and agenda. *Journal of Economic Literature*, *35*(2), 688-726.

Levine, R. (1998). The legal environment, banks, and long-run economic growth. *Journal of Money, Credit and Banking*, *30*(3), 596-613.

Levine, R., & Zervos, S. (1998). Stock markets, banks, and economic growth. *American economic review*, *88*(3), 537-558.

Love, I., & Zicchino, L. (2006). Financial development and dynamic investment behavior: Evidence from panel VAR. *The Quarterly Review of Economics and Finance*, *46*(2), 190-210.

McKinnon, R. I. (1993). *The order of economic liberalization: Financial control in the transition to a market economy*. JHU Press.

Merryman, J. H. (1996). The French deviation. *The American Journal of Comparative Law*, 44, 109-119.

Musso, P., & Schiavo, S. (2008). The impact of financial constraints on firm survival and growth. *Journal of Evolutionary Economics*, *18*(2), 135-149.

North, D. C. (1981). *Structure and change in economic history*. Norton.

Pistor, K., Raiser, M. & Gelfer,S. (2000). Law and Finance in Transition Economies. *Economics of Transition*, *8*(2), 325-368.

Porta, R. L., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy*, *106*(6), 1113-1155.

Rajan, R. G., & Zingales, L. (1996). *Financial dependence and growth* (NBER Working Paper No. 5758). Retrieved from National Bureau of Economic Research website: https://www.nber.org/papers/w5758.

Rajan, R. G., & Zingales, L. (1998). Power in a theory of the firm. *The Quarterly Journal of Economics*, *113*(2), 387-432.

Rigobon, R., & Rodrik, D. (2005). Rule of law, democracy, openness, and income: Estimating the interrelationships. *Economics of Transition*, *13*(3), 533-564.

Robinson, J. (1952). *The rate of interests and other essays*. London: Macmillan.

Saad, W. (2014). Financial development and economic growth: Evidence from Lebanon. *International Journal of Economics and Finance, 6*(8), 173-186.

Shaw, E. S. (1973). *Financial deepening in economic development*. New York: Oxford University Press.

Singh, A. (1997). Financial liberalisation, stockmarkets and economic development. *The Economic Journal*, *107*(442), 771-782.

Smaoui, H., & Nechi, S. (2017). Does sukuk market development spur economic growth?. *Research in International Business and Finance*, *41*, 136-147.

Sokoloff, K. L., & Engerman, S. L. (2000). Institutions, factor endowments, and paths of development in the new world. *Journal of Economic perspectives*, *14*(3), 217-232.

Song, F., & Thakor, A. V. (2010). Financial system architecture and the co-evolution of banks and capital markets. *The Economic Journal*, *120*, 1021–1055.

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

The World Bank (2018a). World Development Indicators. Retrieved May 7, 2018, from https://databank.worldbank.org/data/source/world-development-indicators#.

The World Bank (2018b). Worldwide Governance Indicators. Retrieved May 8, 2018, from https://databank.worldbank.org/data/source/worldwide-governance-indicators.