Some Selected Determinants of Stock Exchange Development: Evidence from Greece

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Abstract:

Purpose: The paper attempts to assess the determinants of stock market development in Greece. The determinants used in the study are domestic credit to private sector (% of GDP) as a proxy of bank credit and stock market total value traded to GDP as a proxy of liquidity.
Design/Methodology/Approach: Ordinary Least Squares (OLS) method of estimation is employed by the author as the methodology of assessing the selected determinants of stock exchange development in Greece. Annual data is utilised from 2001 to 2020. The variables used in the estimation are stock market capitalization to GDP, domestic credit to private sector (% of GDP), and stock market total value traded to GDP.
Findings: The determinants that contribute to the Greek stock market development are domestic credit to private sector (% of GDP) and stock market total value traded to GDP. All these determinants have a statistically significant impact on the stock market development. Domestic credit to private sector (% of GDP) has the most influence on stock market development. Domestic credit to private sector (% of GDP) has a negative and statistically significant effect on the stock market development, whereas stock market total value traded to GDP as a measure of liquidity has a statistically significant and positive impact on the stock market development in Greece.
Practical Implications: The measures of liquidity can be used to assess the efficiency of stock exchanges in a single country or a group of countries.
Originality/Value: The research can spur further discussion about the measures of liquidity of stock exchanges and its effect on stock exchange development. It provides new findings in terms of stock exchange development. It can be used as a starting point to a discussion about different measures of liquidity in the process of assessing a stock exchange development.

Keywords: Stock exchange development, financial markets, ordinary least squares.

JEL codes: C22, O16, G10.

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1. Introduction

In developed market economies, the stock exchange is the basic institution of the capital market, ensuring capital mobilization, its transformation, and valuation. Via the secondary securities market, the stock exchange becomes a channel through which capitals flow between investors and customers. Its importance depends on the number of companies listed and their size, on the volume of transactions, the level of technological advancement or territorial coverage.

Stock exchanges, owing to their liquidity, enable companies to acquire capital in a relatively quick manner, thus allowing for capital allocation, investments, and economic growth (Love and Zicchino, 2006). Since a high level of market liquidity can benefit potential issuers and investors, both will choose a market that will provide them with an easier and cheaper access to capital (issuers) and a faster opportunity to swap assets (investors). The higher the liquidity of stock exchange trading, the trading may be easier and the spread (the difference between the purchase and selling price of a security) may be lower. The vast literature on the subject also prompts some researchers into meta-analyses which can give a more comprehensive view on the financial development – economic growth nexus.

Valickova, Havranek and Horvath (2014) in their meta-analysis conclude studies that examine the effect of financial development on economic growth imply a positive and statistically significant effect. Stock market studies report a larger positive effect on growth, which is stronger (the measures based on stock markets tend to be associated with 40% greater reported growth effects than measures based on banks) in developed countries (for example, financial development is much weaker in sub-Saharan Africa - lower by about 50%). Estimations tend to vary, though. The authors suggest it is due to estimation methods deployed, data used as a proxy of financial development, the frequency of data, the length of an analyzed period, and publication selection bias. Their analysis is based on 1334 estimates from 67 studies, out of which 638 (about 48% of all the estimates) are positive and statistically significant at the 5% level, 446 (33%) are positive but insignificant, 128 (10%) are negative and significant, and 122 (9%) are negative but insignificant.

A meta-regression analysis by Arestis, Chortareas and Magkonis (2015) shows a statistically significant and economically meaningful positive effect from financial development to economic growth. Nevertheless, they indicate that the type of data employed and the different variables used to measure financial development in the analyzed literature constitute some sources of heterogeneity. They also provide evidence suggesting that the empirical literature on the finance-growth nexus is not free from the publication bias.

The author's goal in this paper is to assess some selected factors of the stock market development in Greece in a given timeframe. To this end, the author conducts a literature review and uses selected statistical datasets on financial development.

The following hypothesis is posited; domestic credit to private sector (% of GDP) and stock market total value traded to GDP affect the stock market development in Greece in an economically and statistically significant way.

2. Literature Review

The literature on and research into the subject of stock exchange development and factors that constitute it address the notion that empirical study can improve the functioning of stock exchanges and financial markets in general. The determinants of stock exchange development analysed may contribute to a better understanding of those processes and factors of influence. Researchers implement various indicators and methods of econometric modeling in order to better understand those processes. Some selected studies are listed in Table 1.

Table 1. *Selected factors of stock market development*

No.	Authors/Paper	Factor(s) affecting the development of stock exchanges according to the authors' research	Impact
1.	Greenwood and Jovanovic (1989), Demetriades and Hussein (1996), Shan and Jianhong (2006), Gursoy and Muslumov (2000), Abu-Bader and Abu-Qarn (2008)	Economic growth	Positive, Bi-directional
2.	Levine and Zervos, (1998b); Henry (2000), Bekaert and Harvey (2000); Edison and Warnock (2003)	Liberalization and financial openness	Positive
3.	Kumar et al. (1999)	Average size of an enterprise – the bigger, the better	Positive
4.	Garcia and Liu (1999)	GDP growth, domestic investment and financial intermediary sector development	Positive
5.	Domowitz and Steil (1999)	Reduction in trading cost	Positive
6.	Henry (2000)	Growth rate of investment	Positive
7.	Claessens et al. (2001)	Privatization programs and foreign direct investment	Positive
8.	Boerdlein (2002)	Securitization, trade automation	Positive
9.	Henderson et al. (2004)	Integration	Positive
10.	Dritsaki and Dritsaki-Bargiota (2005)	Economic growth	Positive

11.	El-Wassal (2005)	Economic growth, financial liberalization and foreign portfolio	Positive
12.	Capasso (2006)	Reduction in transaction costs and liquidity costs, resource pooling and saving mobilization, acquisition of information about firms, corporate control, risk diversification, market capitalization ratio, number of listed companies, total value traded, turnover ratio, institutional and regulatory framework, and concentration	Positive (when properly implemented)
13.	Yartey and Adjasi, (2007)	Level of economic development, size of the economy in question, level of financial openness, inflation rate, domestic savings, banking sector development, economic growth,	Positive
14.	Yartey (2008), Kurach (2010)	Modernization rate, stock market liquidity, inflation level political risk, judiciary system, and administrative quality can positively influence stock market development	Positive (when properly implemented)
15.	Bukowski (2009), Bukowski (2012)	Internationalization, integration, globalization	Positive
16.	Bukowski (2010	Growth rate of real physical capital per capita	Positive
17.	Mikita (2011), Bukowski (2011)	Globalization	Positive
18.	Levine et al. (2015)	Adequate system of both regulation and investor and issuer protection	Positive

Source: *The author's own compilation.*

Dritsaki and Dritsaki-Bargiota (2005) examine the causal relationships among financial development, credit market, and economic growth in Greece with the use of a trivariate autoregressive VAR model in the period 1988.1-2002.12. They conclude that there is a bilateral causal relationship between banking sector development and economic growth and a unidirectional causality between economic growth and stock market development in Greece in the given time frame. Greenwood and Jovanovic (1989) point to a mutual dependence and parallelism between the development of financial markets and economic development.

Thalassinos and Politis (2011) in their study of co-integration indicate an increasing level of co-integration between European stock exchanges, an effect which may be influential in further studies along with the level of stock prices volatility and volatility shocks (Ugurlu *et al.,* 2014).

Demetriades and Hussein (1996) also find support for the causation from economic growth to financial development and state the relation is bi-directional. The processes of internationalization, integration and globalization of stock exchanges, closely related to the development of financial markets, are part of the financial development of a quantitative and qualitative nature (Bukowski 2012b; 2009). The same goes for the processes of consolidation of various financial institutions, including smaller and larger stock exchanges (Boerdlein 2002; Levinson 2005) and for the degree of integration and structural changes, which may condition stock exchange development (Thalassinos and Pociovalisteanu 2007; Thalassinos *et al.,* 2015).

3. Data and Model

The data for the study is obtained from the latest (November 2021) version of Global Financial Development Database (Cihak *et al.,* 2012). The annual data is used from 2001 to 2020. The variables involved in the estimation are stock market capitalization to GDP, domestic credit to private sector (% of GDP), and stock market total value traded to GDP.

The following model is built in compliance with the literature and data availability:

$$lnSTOCK_{i,t} = \alpha + \beta_1 \, lnCREDIT_{it} + \beta_2 lnSMLIQUID_{it} + \mu_{it} \qquad (1)$$

where:
$lnSTOCK_{i,t}$ – the natural logarithm of stock market capitalization (% of GDP) for the country i in the year t,
α – the intercept,
$\beta_1, \ldots, \beta_k$ - the structural parameters,
$lnCREDIT_{it}$ - the natural logarithm of domestic credit to private sector (% of GDP) for the country i in the year t,
$lnSMLIQUID_{it}$ - the natural logarithm of stock market traded value (% of GDP) for the country i in the year t,
μ_{it} – the error term.

The model is constructed built using step wise regression with backward elimination. The regressors from the point of view of collinearity are reduced. The regressors whose correlation with other regressors is relatively high and those very poorly correlated with the dependent variable are eliminated as well.

Table 2. *OLS model, using observations 2001-2020 (T = 20). Dependent variable: l_STOCK*

	Coefficient	Std. Error	t-ratio	p-value	
const	5.44121	1.26393	4.305	0.0005	***
l_CREDIT	−0.772637	0.242019	−3.192	0.0053	***
l_SMLIQUID	0.576130	0.118779	4.850	0.0002	***

Mean dependent var	3.465913	S.D. dependent var	0.533184
Sum squared resid	1.091335	S.E. of regression	0.253370
R-squared	0.797954	Adjusted R-squared	0.774184
F(2, 17)	33.56957	P-value(F)	1.25e-06
Log-likelihood	0.704532	Akaike criterion	4.590936
Schwarz criterion	7.578132	Hannan-Quinn	5.174068
rho	0.077763	Durbin-Watson	1.810971

White's test for heteroskedasticity -
Null hypothesis: heteroskedasticity not present
Test statistic: LM = 4.92205
with p-value = P(Chi-square(5) > 4.92205) = 0.425467
Test for normality of residual -
Null hypothesis: error is normally distributed
Test statistic: Chi-square(2) = 2.49776
with p-value = 0.286826
LM test for autocorrelation up to order 1 -
Null hypothesis: no autocorrelation
Test statistic: LMF = 0.108744
with p-value = P(F(1, 16) > 0.108744) = 0.745856
Test for ARCH of order 1 -
Null hypothesis: no ARCH effect is present
Test statistic: LM = 0.0193255
with p-value = P(Chi-square(1) > 0.0193255) = 0.889437
Source: *The author's own calculations with the use of GRETL.*

4. The Results of the Model Estimation

The model estimation indicates that all the variables are statistically significant and in accordance with the theory and hypothesis. The p-value, which is less than 5%, causes the null-hypothesis to be rejected. This means that there is a long run relationship among the variables under study in Greece. The model is well fitted: Adjusted R equal to 0.77 means that the model explains 77% of the variability of the dependent variable STOCK.

There are also diverse levels of impact of the variables on the dependent variable STOCK. A change of the CREDIT variable value by 1 percentage point affects the STOCK change by negative 0.77 percentage point, a change of the SMLIQUID variable value by 1 percentage point affects a STOCK change by 0.58 percentage point.

5. Conclusion

The determinants that contribute to the Greek stock market development are domestic credit to private sector (% of GDP) and stock market total value traded to GDP. The model estimation is based on the OLS method. All the determinants have a statistically significant impact on the stock market development. Domestic credit to private sector (% of GDP) has a maximum influence on the stock market development. Domestic credit to private sector (% of GDP) has a negative and statistically significant effect on the stock market development, whereas stock market total value traded to GDP as a measure of liquidity has a statistically significant and positive impact on the stock market development in Greece.

The negative sign of the structural parameter of CREDIT variable might be attributed to the fact that banking sector and stock exchanges are institutions on the respective markets that supply capital to firms.

They may seem complementary, yet this is not always the case. The results of the estimation for Greece carried out in this article may indicate something completely different. In countries with a banking-oriented financial system, banks remain the main source of financing for enterprises. Moreover, the Greek banking sector seems to be more developed than the stock exchange. Possibly, the situation of the Athens stock exchange and its inability to overcome the difficult situation during the 2007 financial crisis makes the banking sector a stronger competitor. This and other issues may provide an interesting starting point for further research.

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