TRADE OPENNESS, FINANCIAL OPENNESS, AND FINANCIAL DEVELOPMENT IN EUROZONE: EVIDENCE FROM DYNAMIC PANEL DATA[1]

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ABSTRACT

This paper investigates the impact of trade and financial openness on financial development, sampling 19 Eurozone countries with data spanning from 2000 to 2015. We use two of the most important indicators of financial development-private credit and stock market capitalization. The empirical results, using dynamic panel estimation techniques (GMM), suggest that both trade and financial openness are statistically significant determinants of financial development. Our results also suggest that the marginal effects of trade (financial) openness are negatively related to the degree of financial (trade) openness, indicating that relatively closed economies stand to benefit most from opening up their trade and/or capital accounts. Our findings provide partial support to the well known Rajan and Zingales hypothesis, which stipulates that both types of openness are necessary for financial development to take place.

Keywords: Financial development, Trade openness, Financial openness, Dynamic Panel Data Analysis, Eurozone.

Jel Codes: F19, G29, G32.

EURO BÖLGESİNDE TİCARİ AÇIKLIK, FİNANSAL AÇIKLIK VE FİNANSAL GELİŞME: DİNAMİK PANEL VERİDEN KANIT

ÖZET

Bu çalışma, ticaret ve finansal açıklığın finansal kalkınma üzerindeki etkisini 19 Avro Bölgesi ülkesini örnekleyerek 2000'den 2015'e kadar olan verileri incelemektedir. Finansal kalkınmanın en önemli iki göstergesi olan özel kredi ve borsa büyüklüğü kullanıyoruz. Dinamik panel tahmin teknikleri (GMM) kullanıyoruz ve ampirik sonuçlar, hem ticari hem de finansal açıklığın finansal gelişmenin istatistiksel olarak önemli belirleyicileri olduğunu göstermektedir. Sonuçlarımız, ticari (finansal) açıklığın marjinal etkilerinin finansal (ticari) açıklık derecesi ile negatif ilişkili olduğunu ve göreceli olarak kapalı ekonomilerin ticaret ve / veya sermaye hesaplarının açılmasından en fazla yarar sağladığını göstermektedir. Bulgularımız, finansal gelişim için her iki açıklığın gerekli olduğunu belirten iyi bilinen Rajan ve Zingales hipotezine kısmi destek sağlamaktadır.

Anahtar Kelimeler: Finansal Gelişme, Ticari Açıklık, Finansal Açıklık, Dinamik Panel Veri Analizi, Euro Bölgesi.

Jel Kodları: F19, G29, G32.

1. INTRODUCTION

The growing consensus emerging from the vast amount of empirical and theoretical research is that financial sector development of a country greatly facilitates its economic growth (e.g., King and Levine, 1993a, b;

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[1] This paper is an improved version of the paper presented at the 4th International Symposium on Social Humanities and Administrative Sciences (ASOS) organized by Alanya Alaaddin Keykubat University at 3-5 May 2018.
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Jayarathe and Strahan,1996; Demirgüç-Kunt and Maksimovic,1998; Rajan and Zingales,1998; Beck et al., 2000; Carlin and Meyer, 2003; Levine, 2005; Menyah et al., 2014; Henderson et al., 2012 and Kendall, 2012).

In the studies carried out, financial development is seen as required and beneficial for increasing the economic growth and creating a rich nation (Levine, 1997; King and Levine, 1993a; Rajan and Zingales, 1998; Rajan and Zingales, 2003). Also in the studies, a well working stock market is seen as a basic component of the finance sector and the fact that development of well working financial institutions as well as of the stock market plays a critical role in realizing the economic growth (Arestis and Demetriades, 1997; Lawrence, 2006; Kar, 2001; Shan and Jianhong, 2006).

Financial development that expresses the existence of the financial depth and the stability of the credit markets is a positive thing for economic growth (Levine, 2004:1). The development of an economy without credits is not possible (Levine et al., 2000; Levine, 1997; Levine and Zervos, 1998; Rajan and Zingales, 1998). From a wider perspective, credit is a mechanism that makes it possible to carry out projects, which are the basis of the capital of the firms. However, credit does not make it possible for the economy to grow through investment only, also it reinforces the development of efficiency in many ways. Namely, credit helps the development process to continue when firms develop new technologies (Aghion et al., 2005). On the other hand, they help provide efficiency in source distribution between firms and economic sector (Bencivenga, Smith and Starr, 1995; Buera and Shin, 2009; Jeong and Townsend, 2007; Arizala et al., 2009).

Those who defend market based financial systems express that a strong banking system provides investment funding and source transfers to the investments that have return capacity and that have high speed during the credit supply process (Hellwing, 1991). Although these two views are thought to be their substitutions, according to the third view, market and banking based financial systems are supplementary to each other and what is crucial at this point is whether financial markets are efficient rather than the market structure. Well-functioning and efficient financial markets have the power to influence economic growth (Levine, 2004; La Porta et al. 1998). Bencivenga and Smith (1993) indicate that financial intermediates will decrease control costs and credit designation and therefore will have a positive effect on growth by increasing source distribution and production (Greenwood and Jovanovic, 1990). In financial markets, financial arrangements that decrease expertise and process costs increase efficiency by leading to goods and services exchange. Moreover, new investment tools in the financial systems make it easy to exchange goods and services by meeting the requirements of fast developing economies (Greewood and Smith, 1997; Levine, 1997). Finally, access to financing allows firms to better cope with macroeconomic variables (Cavallo et al., 2009).

The frontier of the literature on the effect of trade and financial openness on financial development is shifting toward an examination of the sources of financial development from the perspectives of financial liberalization (McKinnon, 1973), legal systems (La Porta et al., 1998), government ownership of banks (Andrianova et al., 2008), and political stability (Girma and Shortland, 2008; Roe ve Siegel, 2011; Campos et al., 2012).

In the literature as well as in studies that were carried out over the effect of financial development in one country on political and organizational development, it was put forward that democracy (Huang, 2009), role of the output groups (Becerra et al., 2012; Rajan and Zingales, 2003), change of democracy and regime (Girma and Shartland, 2008), regulatory and institutional factors (Baltagi et al., 2007; Pagano, 1993), supremacy of justice, anti-administrative rights (La Porta et al., 1997), efficiency of judicial systems (Demirguc-Kunt and Maksimovic, 1998; Beck et al., 2003), development of proprietary rights (Hodler, 2007), development of organizational quality for banking sector (Law and Habibullah, 2009), and government policies (Cooray, 2011) are basic determiners of financial development.

In the studies carried out on the economic factors determining the financial development (Boyd et al., 2001; Zoli, 2007; Calderon and Rossell, 1990; El-Wassal, 2005; Garcia and Liu, 1999; Yartey, 2010; Demirguc-Kunt and Levine, 1996; Ben Naceur et al., 2007), it is seen that the variables of inflation, the liquidity of stock prices, economic growth, national income, local investments, development of financial intermediator sectors, financial liberalization policies, savings rate, and stock process volume were used.

Another important source of financial development is openness. The literature has focused mainly on two-variable relation between trade openness and financial development (Beck, 2002; Braun and Raddatz, 2005; Do and Levchenko, 2004; Mishkin, 2009; Law, 2009; Baltagi et al., 2009; Kim et al. 2010; Zhang et al., 2015; Hanh, 2010), financial openness and financial development (Chinn and Ito, 2006; Levine, 2001; Law, 2009; Baltagi et al., 2009; Zhang et al., 2015; Hanh, 2010), and financial openness and trade openness (Aizenman

and Noy, 2009). These studies generally find positive relationship between openness and financial development and between trade and financial openness across developed and developing economies.

Rajan ve Zingales (2003), in their studies, found a three-variable relationship among trade gap, financial gap and financial development. Rajan and Zingales (2003) determined the fact that it is not possible for trade gap only to influence financial development without financial gap in 24 developed economies for the period between 1913-1999 period. Rajan and Zingales (2003) puts forward the interest group theory in order to summerize the research results. They argue that interest groups, in particular industrial and financial incumbents, frequently stand to lose from financial development. This is because financial development creates opportunities for new firms to be established, which breeds competition and erodes incumbents' interests. They suggest that those who are in power will have a weaker opposition reaction towards financial development when an economy is open both to trade and finance (capital flows). Baltagi et al. (2009) address Rajan and Zingales's (2003) hypothesis, using data for both developing and industrialized countries. Baltagi et al. (2009) emphasizes the interactive effects of trade gap and financial gap on financial development in the assessment of the simultaneous openness hypothesis. The interaction between trade and financial openness can be used to assess the marginal effect of rising trade (financial) openness on financial development conditional on financial (trade) openness. Because the hypothesis indicates that an economy opens up to trade when its capital account is closed, there will be calls for additional financial repression to protect industrial incumbents, which would prevent financial development from taking off. Thus, the marginal effect of trade openness should be non-positive when the capital account is relatively closed.

This paper represents provide evidence on the openness hypothesis using dynamic panel data techniques in recent samples. The paper addresses the empirical question of whether trade and financial openness can help explain the recent pace in financial development. In order to provide evidence on the simultaneous openness hypothesis, we interact the two openness terms, which allows us to examine whether the impact of one type of openness depends on the degree of the other type of openness.

The remainder of this paper is organized as follows: Section 2 presents the model specification and estimation methods; Section 3 describes the data used in the empirical work and some stylized facts about openness and financial development in Eurozone; Section 4 provides the estimation results and discusses their direct implications; and Section 5 concludes the paper.

2. MODEL AND ESTIMATION METHOD

2.1. Dynamic Empirical Model

The aim of our empirical model specification is to investigate the effects of trade openness and financial openness on different indicators of financial development in Eurozone. Since financial development indicators are likely to display considerable persistence, we specify a dynamic linear equation for financial development that includes a lagged dependent variable, following the prior studies (Baltagi et al., 2009; Zhang et al., 2015):

$$FD_{it} = \beta_0 + \gamma\,FD_{it\text{-}1} + \beta_1 TO_{it} + \beta_2 FO_{it} + \beta_3\,\{TO_{it} \times FO_{it}\} + \beta_4 GDP_{it} + \beta_5 DCrisis_{it} + \mu_{it} \qquad (1)$$

Where FD is an indicator of financial development, TO is trade openness, FO is financial openness, and $TO_{it} \times FO_{it}$ is interaction term. In addition, $GDP, DCrises$ is control variables that denote the GDP per capita gross domestic product, and financial crises dummy, respectively. The specification error term μ_{it} contains cross-sectional and time-specific fixed effects.

$$\mu_{it} = \mu_i + \varepsilon_t + v_{it} \qquad (2)$$

Where v_{it} is assumed to be independent and identically distributed.

In order to assess the simultaneous openness hypothesis that sets the basis of Rajan and Zingales's (2003) interest group theory, the interaction term between the trade gap and financial gap is included in our study. The marginal effect of the rising trade gap and/or financial gap on financial development can be observed by calculating the partial variations of the financial development in terms of openness variables. This calculation is as follows, when compared to the ones carried out before (Baltagi et al., 2009; Zhang et al., 2015).

$$\frac{\partial FDit}{\partial TOit} = \beta_1 + \beta_3 FO \qquad (3)$$

$$\frac{\partial FDit}{\partial FOit} = \beta_2 + \beta_3 TO \qquad (4)$$

2.2. Estimation Method

Explanation regarding the estimation methods of the research was provided under two titles.

2.2.1. Dynamic Panel Estimation

Although the basic estimation for panel data analysis is Pooled Ordinary Least Squares (POLS), consistent estimations cannot be obtained with POLS when there is a relationship among the error term and independent variables. Moreover, POLS does not take the consecutive dependency of the error term into account in time (Wooldrige, 2002: 256). In order to handle these issues mentioned, special estimators were developed for panel data analysis that is classified into two groups; static and dynamic. In the static panel data model, the lagged value of the dependent and the independent variable are not included in explaining the dependent variable. In Static Panel Data method, there lies the idea that economic and commercial behaviour that basically occur in the current period are free from experiences and behaviour forms in the previous periods (Tatoğlu, 2012). However, in economic and commercial behaviour, the effect of previous experience and behaviour is important. When these previous experience and behaviour are considered, a dynamism is provided for the analysis. The panel data methods that take these into account are the ones called dynamic panel data models. In other panel data models, among the factors that may influence the dependent variable, there may be the lagged values of the dependent and independent variables as well as lagged values of the dependent values. From this respect, dynamic panel data analysis can reveal micro and macro dynamics that methods of cross-section or time-series cannot do (Bond, 2002:1).

In the literature of econometrics, dynamic panel data analysis is based on Generalized Method of Moments (GMM), first developed by Hansen (1982). Anderson and Hsiao (1981 and 19821) adapted GMM into panel data. Although Nickell (1981) defended the fact that dynamic models in the panel data analysis were derivative, the method was developed by Arellano and Bond (1991), Aralleno and Bover (1995) and Blundell and Bond (1998) and in the literature of panel data, it is known as System Generalized Method of Moments (SGMM), derived from the names of the authors.

In the GMM estimation method, initially, the first difference of the model is taken, and the difference is converted into a instrumental variable matrix. Then, the converted model is estimated through Generalized Least Squares (GLS). In panel data that does not have a stable data set or panel data in which the number of units is less than the time, first conversion cycle is weak. In this condition, SGMM that uses orthogonal derivations are used. Thanks to this, an efficient instrumental variable estimator can be obtained through SGMM (Baltagi, 2005:148). In SGMM, instead of taking the first difference of a period prior to the current period, the difference of all variables' mean of all future values are taken. Thus, the data loss originating from the first differences method is minimized (Blundell and Bond, 2000).

First Differences GMM estimation method should be preferred in the estimation of relationships among the variables in the panel data where time is more than the number of units. Therefore, in the data sets where the unit are more than the time, SGMM estimation method is preferred in explaining the linear relationship among the variables. GMM and SGMM also have two-step estimators. Under conditions when the independent variables are endogenous variables, the findings obtained from two-step estimators are more consistent and non-derivative. Due to the fact that the number of units is larger than time in this data set, the estimations were

carried out through the two-step SGMM estimation method proposed by Arellano and Bover (1995) and Blundell and Bond (1998). Also, robust standard errors suggested by Windmeijer (2005) were used so that the standard errors in the estimation of small samples can be non-deviated. In the calculation of the robust standard errors aforementioned, the code written by Roodman (2009) was used.

2.2.2. Panel Stationary Test

Another topic to consider in the analysis of regression is that the series used in the model must be stationary. If a model built up with non-stationary data set can be estimated through LS method, relationships that do not really exist among variables can be obtained following a shock. This leads to a problem called spurious regression (Sims, 1980:1). Therefore, it is a must to test whether each variable is stationary for the analysis. In order to provide stationarity, unit root tests are carried out. In panel data analysis, stationarity can be tested through panel unit root tests.

Most of the panel unit root tests suggest approaches derived from Dickey and Fuller (1979) unit root test. Traditional unit root tests are weak in terms of rejecting the H_0 hypothesis explaining the existence of unit root. Panel unit root tests are stronger than traditional unit root tests. This is another advantage of panel data analysis. In the panel stationarity analysis, panel unit root tests are classified into two groups; first generation and second generation. First generation tests are used when there is no correlation among the units; and second generation tests are used when there is correlation among the units. First generation tests are subdivided into two groups, too; common and individual unit root. Among these, Harris and Tzavalis (1999), Breitung (2000), Hadri (2000) and Levin, Lin, Chu (LLC) (2002) tests are common unit root tests. On the other hand, Im, Peseran and Shin (IPS) (2003), Fisher ADF and Fisher PP are individual are root tests with individual unit roots (Choi, 2001).

In the study, Fisher PP panel unit root test, which allows for the unstable panel data set and which allows each unit to have its own auto-correlation coefficient, was preferred. Additionally, Fisher PP is a panel unit root test that becomes stronger when there is correlation between small samplings and units (Levin, Lin and Chu, 2002; Choi, 2001). In testing the unit root of Fisher PP, that the units include root is tested in the H_0 hypothesis. If the coefficient is different from null significantly, it is concluded that the series do not include unit root and that they are stationary.

3. DATA, MEASUREMENT AND SOURCES

The study data comprises a 15-year period starting from 2000 until 2014 from 19 countries in the Euro Zone. Since the data of 19 Eurozone country[5], which also makes the sampling of the research are not available for each year, the data set is in an unstable panel data format. The data set was compiled from the data obtained from the web site of the World Bank (WDI-World Development Indicators). The dependent and independent variables of the research are shown in Table-1, below.

The ratio of credits to GDP (Levine et al., 2000), the ratio of deposit to GDP (Rajan and Zingales, 2003), the ratio of private sectors credits to GDP (Levine et al., 2000), and the ratio of capital market's capitalization (Rajan and Zingales, 2003; Baltagi et al., 2009) are considered as financial development indicators. The dependent variables of this study embrace both the development of banking and the development of capital market. Thus, financial development could be studied in detail in terms of banking and capital market.

In the literature, financial openness (FL) is measured from two perspectives widely; actual and legal. The former, actual financial openness, was developed by Lane and Mlise-Ferretti (2007). Actual financial openness is calculated by the proportion of a country's total responsibilities and foreign assets to GDP. The latter, legal financial openness, was suggested by Chinn and Ito (2006). Legal financial openness is determined by coding the limitations of a country's financial processes beyond its border through puppet variables. In the study, the actual measurement that can access the financial openness data was adopted. Trade Openness (TO), which is one of the independent variables of the study, shows a country's or economy's level of trade relationships with other economies and countries. In the study, trade openness was calculated by proportioning total of a country's

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[5] The eurozone consists of Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain.

import and export to GDP, just like in the studies carried out by Baltagi et al. (2009), Kim et al. (2010), Menyah et al. (2014) and Zhang et al. (2015). Thus, the effect of actual financial openness and trade openness on the financial development of Euro zone was studies in the study.

Table 1. Variables and Explanations

Variables			Explanations
Dependent variables: financial dedelopment (FD)	The banking development indicators (BDI)	BDI1	Domestic credit to private sector by banks (% of GDP)
		BDI2	Domestic credit provided by financial sector (% of GDP)
		BDI3	Domestic credit to private sector (% of GDP)
	The stock market development indicators (SMDI)	SMDI1	Market capitalization of listed domestic companies (% of GDP)
		SMDI2	Stocks traded, total value (% of GDP)
		SMDI3	Stocks traded, turnover ratio of domestic shares (%)
Independent variables:	Economic, Openness and Finacial Crisis	GDP	GDP per capita growth (annual %)
		FO	Financial Openness
		TO	Trade Openness
		$TO \times FO$	Interaction term of Trade Openness x Trade Openness
		DCrisis	The financial global crisis puppet changer is 0 in 2008 and before and 1 after 2008.

The role of economic growth on financial development is still among the highly-debated topics in the literature both theoretically and practically. As was in the study carried out by Rajan and Zingales (2003), in the study, economic growth is included in the financial development model by being proportioned to the growth rate of real GDP, so that this role could be revealed. Finally, to determine the effect of global financial crisis on financial development, a global financial crisis puppet variable was included in the financial development model, just like in the studies of Hanh (2010) and Rashti et al. (2014). Thus, with the study, it was attempted to reveal the effect of economic growth, trade openness, financial freedom and global financial crisis on the financial development of Euro zone countries.

4. EMPIRICAL RESULTS

The findings of the research were presented under three titles; yearly tendency of variables in the model, correlations between variables, and panel data analysis results.

4.1. Tendencies of the Variables

The tendencies of the dependent and independent variables in the study during the period of study period are shown in Fig. 1-4 below.
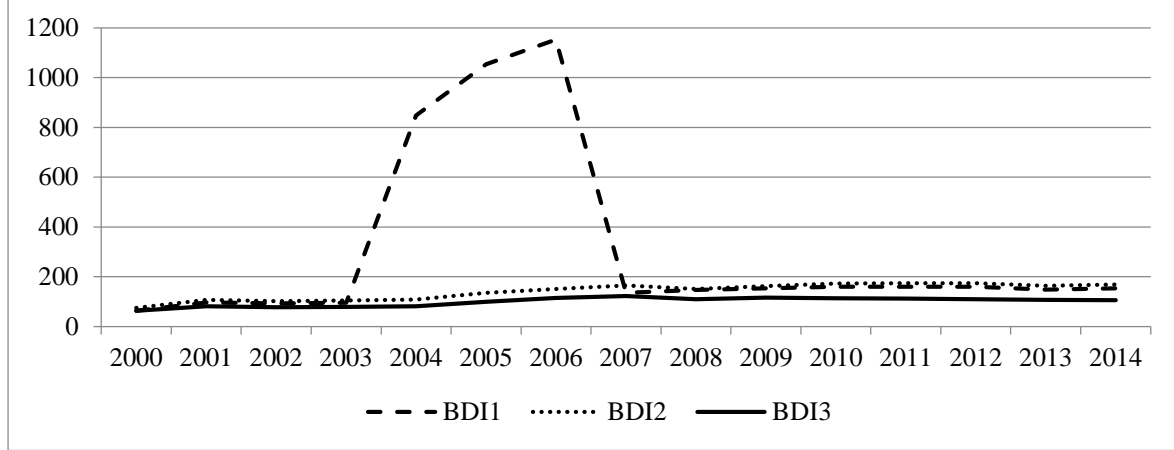
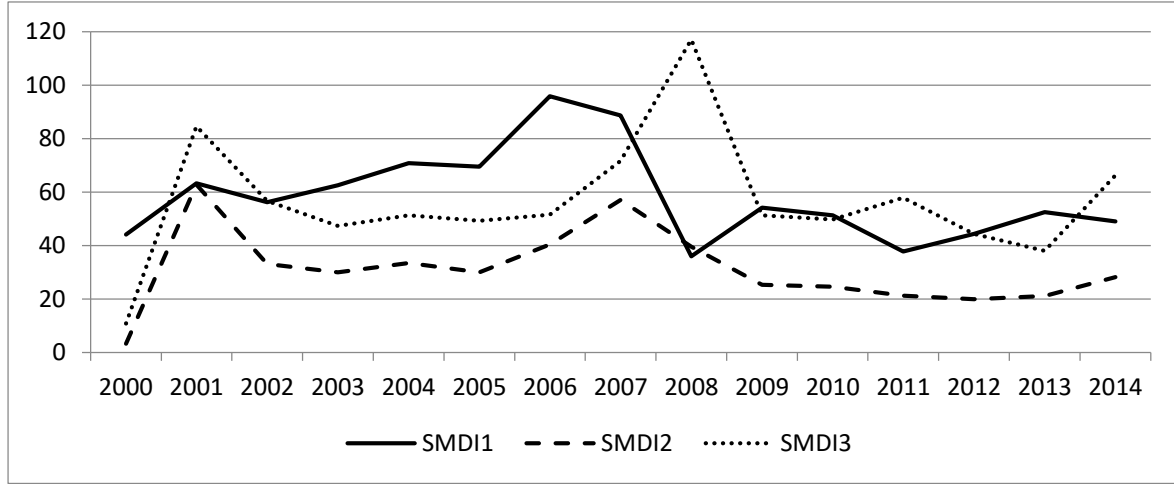**Figure 1.** The Banking Development Indicators

Figure 2. The Stock Market Development Indicators

In Graphic 1 above, a slight rising tendency for BDI2 and BDI3 – indicators of banking – was experienced during the period of the study. For BDI1 variable, there is a similar slight rising tendency in all years except for the years between 2003-2007. After all, there is a dramatic jump for BDI1 between 2003-2007 and afterwards it goes back to old values. These findings may mean that banking indicators are not significantly affected by the global crisis or even if they are affected, they go back to their old conditions fast. Graphic 2 shows the development indicators of the capital market. From the graphic, it can be seen that the variables of the capital market fluctuate and that, especially, there experienced excessive changes in the global crisis period. From here, it can be concluded that the indicators of the capital market do not have a routine trend. The indicators of the capital market are more prone to change when compared to the indicators of the banking in the Euro zone.
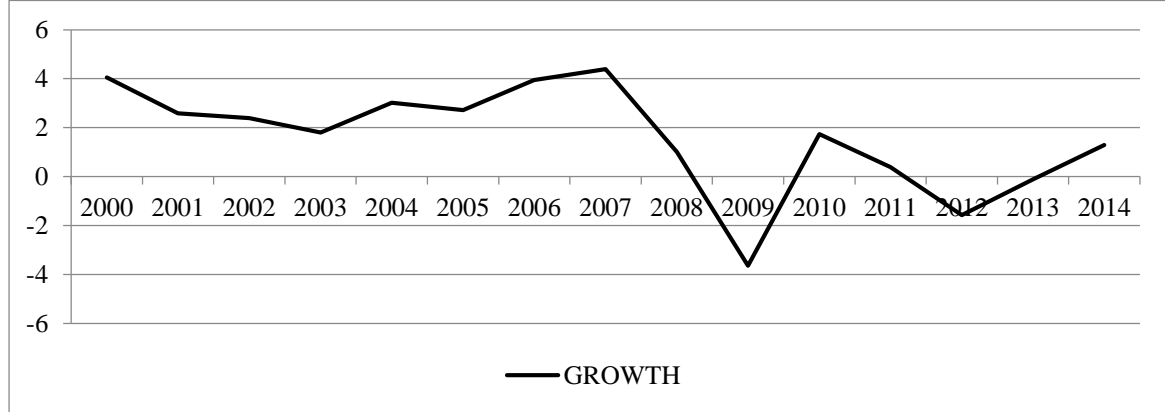
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http: //dergipark.gov.tr/gumusgjebs - ISSN: 2147-415X

Kış-2018   **Winter-2018**
Cilt: 7 Sayı: 14 (01-17)   **Volume: 7 Issue: 14 (01-17)**
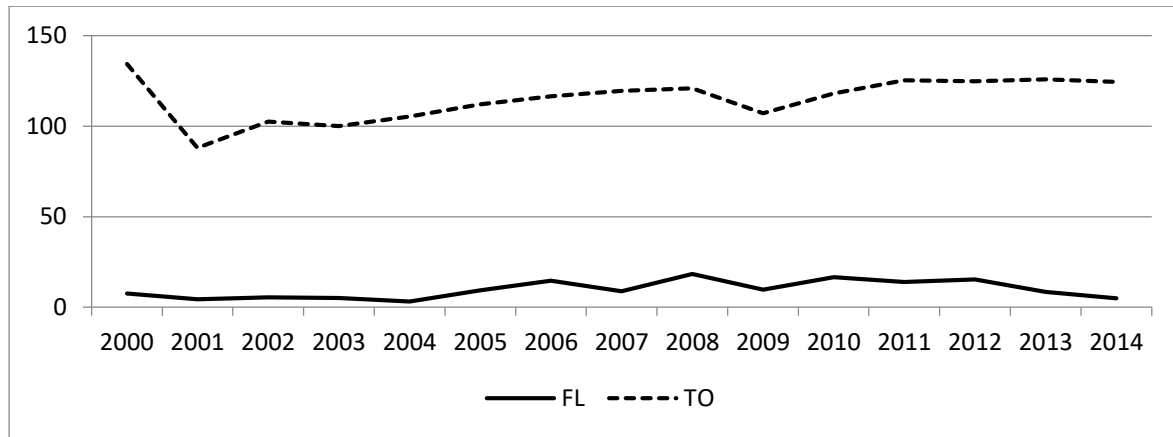
Figure 3. GDP Per Capita Growth (%)

Figure 4. Financial Openess and Trade Openess

The graphic 3 above reveals the development of growth rate in the income per capita in Euro countries. The growth rate decreased until 2003 and then it increased until the advent of the global crisis. Following the crisis, the growth became unstable and showed a fluctuating scheme. Graphic 4 shows the tendency of financial and trade openness indicators. In the financial liberation indicator, there is an increasing curve during the period of the study. In trade openness, there is a steep decline in 2001 and then there is a slight increase following that. It can be uttered that the growth of income per capita following the global crisis in the Euro zone was negative and that the trade openness and financial liberation were partially negatively affected.

4.2. Correlations of the Variables

Correlations among the variables are presented in Table 2. The correlations among the variables of financial development are found statistically significant. Thus, variables of development of banking and development of capital market, which also show the financial development, have an important bound both within themselves and mutually. A significant relationship was detected between the indicators of financial development and growth rate – one of the independent variables. This finding proves that there is a strong bound between the growth rate of national income per capita and the indicators of financial development in Euro zone countries. There is a partial relationship between financial development indicators and financial independence. With financial independence, the relationship among the indicators of capital market development comes to the fore more. There is a partial relationship between trade openness and financial development indicators. It was seen that trade openness has a more evident relationship with the capital market indicators. Therefore, it is more

related to the development of the capital market in the Euro zone rather than the financial independence and the development of trade openness.

Table 2. Correlations Among the Variables

	BDI1	BDI2	BDI3	SMDI1	SMDI2	SMDI3	GROWTH	FO
BDI1	1							
BDI2	-0.118*	1						
BDI3	-0.092*	0.917***	1					
SMDI1	-0.078	0.030	-0.100*	1				
SMDI2	-0.093*	0.044	0.038	0.202**	1			
SMDI3	-0.098*	0.036	0.008	-0.081	0.791***	1		
GROWTH	0.120*	-0.285**	-0.288**	0.346***	0.006	-0.135*	1	
FO	-0.036	0.169*	0.078	0.154*	-0.054	-0.153*	0.076	1
TO	0.015	0.032	-0.159*	0.450***	-0.403***	-.481***	0.246**	0.423***

Note: *, **, and *** shows the statistical significance of 0.10, 0.05 and 0.01 levels, respectively.

In the Euro zone countries, it emerged that the relationship between all the financial development indicators and growth rate of the national income per capita as well as between development indicators of capital market and financial and trade openness is crucial. These findings show that the development of the capital market is related to the increase in welfare level and increase both in financial development and commercial and financial processes.

4.3. Dynamic Panel Data Estimation

Panel data analysis findings are presented below as stationarity test of the variables in the first place, and dynamic panel data estimation of the models, in the second place.

4.3.1. Panel Data Stationary Analysis

With the PP Panel unit root test, unit root findings of the study were presented in Table 3 below. Since all the P, Z, L*, and P_m statistics of Fisher P-P test return the same result, only the Adjusted Reverse X^2 value showing the P_m statistics were reported in Table 3.

Table 3. Stationarity Test of the Variables

Dependent variables	Adjusted Reverse X^2
The banking development indicators	
Domestic credit to private sector by banks (% of GDP) (BDI1)	1.6789**
Domestic credit provided by financial sector (% of GDP) (BDI2)	1.4987*
Domestic credit to private sector (% of GDP) (BDI3)	1.465*
The stock market development indicators	
Market capitalization of listed domestic companies (% of GDP) (SMDI1)	1.7568**
Stocks traded, total value (% of GDP) (SMDI2)	2.9177***
Stocks traded, turnover ratio of domestic shares (%) (SMDI3)	18.7337***
Independent variables	
GDP per capita growth (annual %) (GROWTH)	7.7811***
Financial Openness (FO)	10.3965***
Trade Openess (TO)	10.5120***

Note: *, **, and *** shows the statistical significance of 0.10, 0.05 and 0.01 levels.

It can be seen that all the variables in Table-3 do not include unit root, namely, they are stationary. According to this, the variables are stationary at first order. Since all the variables are stationary at their levels, panel data analysis estimation will be performed for variables at their levels. Thus, the probability of spurious regression will be eliminated in the analysis. It will be tried to reveal the effects of the growth of national income per capita, trade openness, financial independence and global crisis on estimated panel data analysis models as well as the financial development indicators of countries in the sample.

4.3.2. Dynamic Panel Data Estimation

In the findings obtained from the two-step SGMM estimator and presented in Table 4-5, all the models are significant when the results of the Wald test – carried out to test the general significance of the models – were studied. Additionally, for the efficiency of the estimated models, instrumental variables must be carefully selected. There are tests specifically developed for this. These are auto-correlation tests, the Sargan Test, and the Hansen Test. As far as the models are concerned, according to Arellano and Bond's (1991) first order (AR1) and second order (AR2) auto-correlation tests, the models meet the requirement of being non-autocorrelation during the testing of first order auto-correlation existence. Finally, the robust Hansen Test that was performed to test the validity of instrumental variables in the models was found insignificant. According to this test, the instrumental variables are valid in the estimation performed by SGMM method and the model is appropriate. Therefore, dynamic panel models' requirements related to general significance, autocorrelation and instrument variables were met.

Table 4. The Banking Development Indicators

	$BDI1_t$	$BDI2_t$	$BDI3_t$
$BDI1_{t-1}$	0.648***		
$BDI2_{t-1}$		1.015***	
$BDI3_{t-1}$			0.960***
$GROWTH_t$	6.260***	-0.002	0.588
Openness Variables			
Financial Liberalization (FO_{t-1})	-0.006	0.097***	0.234
Trade Openness (TO_{t-1})	0.503***	0.031***	0.062
İnteraction ($FO_{t-1}*TO_{t-1}$)	-0.003***	-0.001***	-0.001*
Global Financial Crisis Variable			
$DCrisis_t$	-2.075	-2.228***	-3.524*
Wald Test	13700***	45409***	11000***
Hansen Test (p-value)	17.37 (0.98)	14.52 (0.96)	15.41 (0.97)
AR1 test (p-value)	-1.00 (0.317)	-1.60 (0.11)	-1.41 (0.157)
AR2 test (p-value)	1.00 (0.317)	1.21 (0.225)	1.24 (0.213)
Sample period	2000-2014	2000-2014	2000-2014
Number of time periods (T)	15	15	15
Number of countries (i)	19	19	19

Note: *, **, and *** shows the statistical significance of 0.10, 0.05 and 0.01 levels.

Table 4 shows the findings of the development model. The effect of a period delay, growth rate, trade openness, and the variable of trade openness-financial independence interaction was found to be statistically significant on the Domestic credit to private sector by banks (BDI1), the dependent variable of the first equation. The effect of financial independence and global crisis is not statistically significant on Domestic credit to private sector by banks (BDI1). In the second equation, the effect of a period of delay, financial independence (as a variable of openness), trade openness and the variable of trade openness-financial independence interaction was statistically significant on Domestic credit to private sector by financial sector (BDI2). Also, the effect of

the global financial crisis puppet variable is also significant. The only insignificant variable is the growth rate. In the third equation, the Domestic credit to private sector by private sector (BDI3) is statistically found to be significant by the effect of a period of delay, by the trade openness and the variable of trade openness-financial independence interaction, and by the global financial crisis puppet variable. It was determined that Domestic credit to private sector (BDI3) is not significantly influenced by the growth rate, financial independence, and trade openness.

Going straight to the hypothesis of interest, we note that in the private credit regressions utilizing the measure of financial openness in Table 4, financial openness and trade openness enter with positive and statistically significant coefficients at the 1% level, while the interaction term enters with a negative coefficient that is also significant at the 1% level. Moreover, the estimated coefficients suggest that the impact of trade and financial openness is economically meaningful.

The finding that trade openness has a positive impact on the banking development indicators of financial development is in consistent with several studies (e.g. Baltagi et al. 2009; Aizenman, 2008; Beck, 2002; Ginebri et al., 2001; Mishkin, 2009; Hanh, 2010; Kim et al. 2010) that find a positive link between trade openness and financial development. The positive impact of trade openness on the banking development indicators might be due to a balanced development between trade and the financial sector.

The finding that financial openness has a positive impact on the banking development indicators of financial development is in consistent with several studies (e.g. Baltagi et al. 2009; Zhang et al. 2015; Hanh, 2010) that find a positive link between financial openness and financial development. The positive relationship between financial openness and banking development indicators might be related to the positive spillover effect of the foreign investment movements. Levine (2001) finds that liberalizing restrictions on international portfolio flows tends to enhance stock market liquidity and allowing greater foreign bank presence tends to enhance the efficiency of the domestic banking system. Financial openness efficiently advances the competition as well as the financial activities among the financial institutions in the Euro zone. Trade openness-financial independence interaction variable was determined to affect the banking development indicators negatively. Our findings point to the fact that the negative relationship of the marginal effects of trade (financial) openness with financial (trade) openness degree may provide a benefit for relatively close economies opening trade and/or capital accounts. Importantly, the treatment of the interaction term as endogenous does not change the qualitative nature of the results. In particular, the coefficient of the interaction term -0,003 and -0,001. Therefore, as a result of the study, it can be suggested that the interaction of openness with the development of banking in Euro zone is valid. The finding that interaction term has a negative impact on the banking development indicators of financial development is in consistent with several studies (e.g. Baltagi et al. 2009; Zhang et al. 2015). Also in the study, it was obtained that the growth rate and global financial crisis have a relative effect on the indicators of capital market development.

In Table 5, the findings related to the development model of the capital market. The effect of a period delay, financial independence, trade openness, the variable of trade openness-financial independence interaction, and puppet variable for global financial crisis was found to be statistically significant on the Market capitalization of listed domestic companies (SMDI1), the dependent variable of the first equation. Contrary to this, the effect of the growth rate is statistically insignificant. The effect of a period delay, growth rate, financial openness (as a variable of openness), trade openness, and the variable of trade openness-financial independence interaction was found to be statistically significant on the Stocks traded, total value (SMDI2), the dependent variable of the second equation. The effect of the puppet variable for the global financial crisis is not significant. In the third equation, stocks traded, turnover ratio of domestic shares (SMI3) are statistically and significantly influenced by a period delay, growth rate, openness variables and puppet variable for global financial crisis. Examining now the regressions relating to capital market development in Table 5 that utilise the financial openness, we first note that the effects of openness terms appear to be qualitatively similar to those obtained the banking development indicators for private credit, although they are now more sensitive to the treatment of the openness terms. It was determined that the trade openness (as an indicator of openness), financial independence, and the interaction variable of trade openness-financial independence influence all the development indicators of capital market. For the regressions relating to capital market development, both trade openness and financial liberalization (openness) are positive and significant at the 5% level or higher, irrespective of how they are treated. The interaction term is negative but its level of significance at the 5% level or higher when the openness terms are treated as endogenous.

Table 5. The Stock Market Development Indicators

	$SMDI1_t$	$SMDI2_t$	$SMDI3_t$
$SMDI1_{t-1}$	0.599***		
$SMDI2_{t-1}$		0.802***	
$SMDI3_{t-1}$			0.815***
$GROWTH_t$	0.458	0.887***	4.508***
Openness Variables			
Financial Liberalization (FO_{t-1})	-0.358***	0.181***	0.446*
Trade Openness (TO_{t-1})	0.193***	0.005**	-0.101***
İnteraction ($FO_{t-1}*TO_{t-1}$)	0.002***	-0.001***	-0.002**
Global Financial Crisis Variable			
$DCrisis_t$	-1.235***	0.330	2.187***
Wald Test	19667***	56800***	35025***
Hansen Test (p-value)	13.54 (0.96)	16.30 (1.00)	13.24 (0.95)
AR1 test (p-value)	-1.57 (0.116)	-1.58 (0.115)	-2.00 (0.046)
AR2 test (p-value)	0.75 (0.454)	-0.73 (0.448)	-1.50 (0.134)
Sample period	2000-2014	2000-2014	2000-2014
Number of time periods (T)	15	15	15
Number of countries (i)	19	19	19

Note: *, **, and *** shows the statistical significance of 0.10, 0.05 and 0.01 levels

The findings from both data sets suggest that trade and financial openness are statistically significant determinants of banking sector development. It is seen that the marginal effects of trade (financial) openness on private sector credits have a negative relationship with the financial (trade) openness degree. This finding points to the fact that the effect of this openness more related to the relatively closed economies, rather than the open economies. This finding also shows that openness has a similar effect on capital market. Therefore, as a result of this study, it can be suggested that openness indicators are valid for the development of capital markets in the countries within Euro zone. Here, it was revealed that the trade openness and financial independence variables – both separately and together as an interaction variable – are determiners for the development of capital markets in the countries within Euro zone. The growth rate and global financial crisis were found to be relatively influential in the indicators of capital market development indicators.

5. CONCLUSION

The findings obtained from this study emerges that the variables of trade openness and financial independence– both separately and together as an interaction variable–are determiners for the development of capital markets in the countries within Euro zone. From the findings of the study, it is seen that the marginal effects of trade (financial) openness on private sector credits have a negative relationship with the financial (trade) openness degree. This finding points to the fact that the effect of this openness more related to the relatively closed economies, rather than the open economies. This finding also has a similar effect on capital market. Therefore, as a result of this study, it can be suggested that openness indicators are valid for the development of capital markets in the countries within Euro zone. From here, it was concluded that the trade openness and financial independence variables – both separately and together as an interaction variable – are determiners for the development of capital markets in the countries within Euro zone. Thus, our findings provide partial support to the Rajan and Zingales hypothesis, which stipulates that both types of openness are necessary for financial development to take place.

The results of our study are in line with the idea that the development of the financial sector of a country resulting from extensive empirical and theoretical research greatly facilitates the economic growth of that country. In other words, the results of many studies in the literature support the results of our study. Our results offer for policy makers in low income countries aspiring to develop their economies by developing their

financial systems. There may be good news for policy makers in low income countries that are relatively closed, since opening up their capital accounts may provide an effective stimulus to financial development.

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