



OPENNESS AND FINANCIAL DEVELOPMENT IN CENTRAL AND EASTERN EUROPEAN COUNTRIES

BAYAR Yilmaz

Usak University, Turkey

AKYUZ Fatma

Usak University, Turkey

EREM Isil

Usak University, Turkey

Abstract:

Great numbers of countries have made the limitations loose on the transnational goods, services and capital flows and begun to follow a policy of export-oriented growth. Total value of global financial asset flows exceeded the value of global trade over time and financial markets have experienced considerable expansions in almost every country. This paper investigates the interaction between openness and financial development in 9 Central and Eastern European countries during 1996-2014 period employing cointegration test of Westerlund and Edgerton (2007) and causality test of Dumitrescu and Hurlin (2012). We reached that openness affected financial sector development positively in the long term. Furthermore, there was one-way causality from financial openness to financial sector development.

Key words: *Financial openness, trade openness, financial sector development, panel data analysis*

1. Introduction

Theoretical considerations on finance-growth nexus dated back to Bagehot (1873) and extensive theoretical and empirical studies have researched the finance-growth nexus until today especially since emergence of theories of endogenous growth (see Nyankomo and Stephen (2015)). Theoretical studies suggest that development of financial sector contributes to the growth positively by way of several channels as follows (Valderrama, 2003):

- Financial institutions are much more successful about determination of potentially good projects compared to the individuals due to their capability and they can monitor the borrowers better to see whether they use the funds productively.
- Contributing to the capital accumulation providing alternative saving instruments and fund mobilization.
- Allocating the capital to the most productive investment projects.
- Easing the risk diversification and decreasing the liquidity risk through secondary markets.

Many empirical studies have verified these theoretical considerations (e.g. see Hassan et al. (2011), Pradhan et al. (2016)). However some recent studies reached no significant or negative relationship between growth and financial development for different countries (e.g. Narayan and Narayan (2013), Kenza and Eddine (2016)). Therefore, financial sector development has become significant for economic growth and many researchers have investigated the determinants behind the development of financial sector. The studies have revealed that growth, inflation, savings, investment, trade openness and financial liberalization, political stability, institutional development and governance have been major determinants of financial development (e.g. see Huang (2010), Naceur et al. (2014)).

Central and Eastern European (CEE) countries have transited to market economy from command economy and liberalized their economies gradually since collapse of Iron Curtain in 1989. They have experienced significant improvements in their financial sectors with the contribution of European Union (EU) membership negotiations. In this context, the main focus of the study is to research the interaction between openness and financial development in 9 CEE countries in short and long run. We make a contribution to the present literature using second generation econometric tests regarding cross-sectional dependency and heterogeneity. Furthermore, this study will be one of the early studies for this group of countries. The next part of the paper checks up the existing empirical studies. The third section describes the dataset and econometric method employed in the paper. The fourth section gives the results of empirical application and discusses the major findings. The paper eventuates with the Conclusion part.

2. Literature review

Financial and trade openness have potential to influence development of financial sector. Increasing financial openness may contribute to the financial development by improving the functioning and financial services of financial sector and raising efficiency of capital allocation (Levine, 2001; Claessens et al. (1998)). On the other side trade openness contributes to the development of financial sector by increasing the necessity of insurance and risk diversification through financial institution due to increasing uncertainty, income volatility, foreign competition and higher exposure to external shocks (Newbery and Stiglitz, 1984; Svaleryd and Vlachos,

2002). Furthermore, Do and Levchenko (2004) suggested that increasing trade openness affects financial development positively or negatively through external finance demand depending on the income levels of the countries. In this context, financial sectors of the countries with relatively higher income are affected positively from increasing trade openness, while financial sectors of the countries with relatively lower income are influenced negatively from the increasing trade openness. However, Rajan and Zingales (2003) drew attention to the opening time of finance and trade and asserted that opening trade and finance at once is essential for development of finance sector and this proposition is called as Simultaneous Openness Hypothesis (SOH) in the literature. Finally increasing openness also has potential to affect the development of financial sectors by raising financial contagion, the frequency and severity of the crises.

Many empirical studies have conducted to reveal the interaction between openness and financial development or whether SOH is valid or not and these studies have reached mixed findings. Some studies revealed that both financial and trade openness affect financial development positively (e.g. Law and Demetriades (2006), Law (2007), Baltagi et al. (2009), Law (2009), Acikgoz et al. (2012), Zhang et al. (2015), Onanuga and Onanuga (2016)), while some papers found that only trade or financial openness had positive effect on development of financial sectors (e.g. see Kim et al. (2010), Le et al. (2016), Muhammad et al. (2016)). However some papers have revealed that there is no significant interaction amid financial/trade openness and development of financial sector (e.g. see David et al. (2014), Muhammad et al. (2016)).

Law (2007, 2009) analyzed the interplay between openness and financial sector development and tested the validity of SOH for different groups of developing countries employing panel regression and revealed that openness affected financial development positively and SOH is valid. Law (2008) also researched the interplay among finance and trade openness and financial sector development in Malaysia using ARDL approach and found that both openness affected financial development positively, but no findings in favor of SOH. Law and Habibullah (2009) also reached similar results for 27 countries from G-7, Europe, East Asia and Latin America employing dynamic panes regression. Calderón and Kubota (2009) also analyzed the interplay amid financial openness and development of financial sector in 145 countries during 1974-2007 period using panel regression and found that financial openness affected financial development positively, but it depends on the institutional quality, protection of investors and trade openness.

In another study, Baltagi et al. (2009) researched the interplay between openness and development of financial sector in developing and developed countries employing dynamic regression and revealed that openness had positive influence on financial sector development. But marginal impact of financial (trade) openness was found to be negatively connected with trade (financial) openness degree. So their findings support SOH partially. On the other side, Kim et al. (2010) researched the interplay between financial sector development and trade openness in 88 countries during 1960–2005 period using Pooled Mean Group estimator and revealed that trade

openness had positive influence on financial sector development over the long run and negative influence over the short run. Acikgoz et al. (2012) also researched the interaction between development of financial sector and openness in Turkey over January 1989-February 2007 employing ARDL approach and revealed a positive relationship between development of financial sector and financial and trade openness.

David et al. (2014) investigated the interaction between development of financial sector and openness in 34 African countries employing panel regression and did not find a robust relationship among financial sector development and financial and trade openness. On the other side, Niroomand et al. (2014) analyzed the interaction between development of financial sector and trade openness in 18 emerging markets during 1980-2011 period employing ARDL approach and revealed that financial development had positive impact on trade openness in short and long run. Zhang et al. (2015) also researched the interplay between financial sector development and openness in China during 2000-2009 period employing dynamic panel regression and revealed that openness affected the efficiency and competition of financial sector positively, but affected the size of financial sector negatively. So their findings are in favor of SOH.

Le et al. (2016) researched the determinants of financial development in 26 Asian countries during the 1995-2011 period employing dynamic panel regression and revealed that trade openness affected financial development positively in developed countries, but had no impact in developing countries. In another study, Muhammad et al. (2016) researched the interplay between development of financial sector and trade openness in Pakistan over the period 1971 and 2011 using Johansen cointegration and Granger Causality test and revealed that trade openness affected financial development positively and a one dimensional causality from trade openness to financial development. Finally Onanuga and Onanuga (2016) analyzed interaction between openness and financial sector development using panel regression in Nigeria and found that SOH is valid for Nigeria.

3. Data and method

In this paper, the interaction between openness and development of financial sector was researched in 9 CEE countries during 1996-2014 period employing Westerlund and Edgerton (2007) cointegration test and Dumitrescu and Hurlin (2012) causality test.

3.1 Data

We employed domestic credit to private sector for financial development considering the relatively high share of banking sector in financial sector. On the other side, we substituted total trade volume for trade openness and financial openness index of Chinn and Ito (2006) for financial openness. Finally, we established our

sample considering the definition of OECD (2001) and included Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Poland, Romania, Slovak Republic, Slovenia regarding the data availability. Data description and their symbols were given in Table 1.

Table 1: Data description

Variable	Symbol	Data Source
Domestic credit to private sector (% of GDP)	DCRD	World Bank (2017a)
Sum of exports and imports (% of GDP)	TO	World Bank (2017b)
Financial openness index	FO	Chinn and Ito (2006 and 2017)

We used E-Views 9.0, Stata 14.0, and Gauss 11.0 software packages for the econometric application in the study. The summary of the dataset is presented in Table 2. The correlation matrix showed that there was a positive correlation between both kinds of openness and development of financial sector.

Table 2: Descriptive statistics and correlation matrix

Variable	Obs	Mean	Std.Dev.	Min.	Max.
DCRD	171	43.11979	19.89675	0.1858704	101.2876
TO	171	108.6064	33.46423	45.47565	183.4055
FO	171	0.9685422	1.319928	-1.188757	2.389193
	DCRD	TO	FO		
DCRD	1	0.4479	0.4841		
TO	0.4479	1	0.5607		
FO	0.4841	0.5607	1		

3.2. Econometric Methodology

Cross-sectional independency between the series and homogeneity of cointegrating coefficients are determinative for specification of econometric tests employed in further stages of the empirical application. For this reason, first we tested whether there is cross-sectional dependency among the variables with LM test of Breusch and Pagan (1980) because N (cross-section dimension)=9 is found to be lower than T (time dimension)=19 and tested homogeneity of the cointegrating coefficients with adjusted delta tilde test of Pesaran and Yamagata (2008). Afterwards, we examined the stationarity of the series with Pesaran (2007) CIPS unit root test taking notice of cross-sectional dependency. In the next stage, we investigated cointegrating relationship between openness and development of financial sector with panel bootstrap cointegration test of Westerlund and Edgerton (2007) due to existence of heterogeneity and cross-sectional dependency and cointegrating coefficients was estimated with AMG (Augmented Mean Group) estimator (see Eberhardt and Bond (2009), Eberhardt and Teal (2010, 2011)). Finally, we analyzed the casual interaction among the series with Dumitrescu and Hurlin (2012) causality test.

Westerlund and Edgerton (2007) panel bootstrap cointegration test, based on lagrange multiplier test of McCoskey and Kao (1998), takes notice of both cross-sectional dependency and heterogeneity and yields robust consequences in case of small samples. The test statistic is expressed as follows:

$$LM_N^+ = \frac{1}{NT^2} \sum_{i=1}^N \sum_{t=1}^T \hat{w}_i^2 s_{it}^2 \quad (1)$$

In (1) numbered equation, partial sums of error terms (s_{it}^2) and long term variances (\hat{w}_i^2) are obtained from cointegration model estimated with fully modified ordinary least squares. The critical values calculated from bootstrap are used in case there is cross-sectional dependency (The null hypothesis: There is cointegration).

Short-term causality among the series were analyzed by causality test of Dumitrescu and Hurlin (2012). The test takes consider of heterogeneity between the countries and the causality test model is expressed for the stationary variables of x and y as follows (Dumitrescu and Hurlin, 2012):

$$x_{i,t} = \alpha_i + \sum_{k=1}^k \gamma_i^{(k)} x_{i,t-k} + \sum_{k=1}^k \beta_i^{(k)} y_{i,t-k} + e_{i,t} \quad (2)$$

$$y_{i,t} = \alpha_i + \sum_{k=1}^k \gamma_i^{(k)} y_{i,t-k} + \sum_{k=1}^k \beta_i^{(k)} x_{i,t-k} + e_{i,t} \quad (3)$$

The null hypothesis is that there is y variable is not cause of x variable for all units.

4. Empirical Analysis

4.1. Cross-sectional dependency and homogeneity tests

We examined whether there is cross-sectional dependency between the variables series with LM test of Breusch and Pagan (1980), because cross-sectional dimension (N=9) was lower that time dimension (T=19) of the dataset and the findings were shown in Table 2. So the null hypothesis was rejected at 1% significance level (p value=0.000) and we concluded that there is cross-sectional dependency between the variables. Furthermore, we investigated the homogeneity of the cointegrating coefficients by adjusted delta tilde test of Pesaran and Yamagata (2008) and the results denoted that the null hypothesis was denied and the cointegrating coefficients were found to be heterogeneous.

Table 3: Results of cross-sectional dependence and homogeneity tests

Cross-sectional dependency tests		
Test	Statistic	p-value
LM (Breusch and Pagan (1980))	134.7	0.0000
LM adj* (Pesaran et al. (2008))	24.73	0.0000
LM CD* (Pesaran (2004))	9.567	0.0000
Homogeneity tests		
Test	Statistic	p-value
Delta_tilde	9.797	0.000
Delta_tilde_adj	10.953	0.000

*two-sided test

4.2 CIPS Panel Unit Root Test

We viewed the stationarity of the series with Pesaran (2007) CIPS (Cross-sectionally augmented IPS (Im-Shin-Pesaran (2003)) test considering the cross-sectional dependency among the series. The findings were shown in Table 3 and denoted that DCRD, TO and FO were I(1).

Table 4: The results of Pesaran (2007) CADF unit root test

Variables	Pesaran (2007) Panel Unit Root test (CIPS- Z [t-bar])	
	Intercept only	Intercept + Trend
DCRD	0.849 (0.802)	1.545 (0.939)
dDCRD	-3.030 (0.001)***	-3.663 (0.000)***
TO	-1.540 (0.162)	0.101 (0.540)
dTO	-5.341 (0.000)***	-4.008 (0.000)***
FO	-1.461 (0.172)	-0.111 (0.456)
dFO	-4.594 (0.000)***	-3.305 (0.000)***

Source: Authors' own elaboration based on the results of Pesaran (2007) CADF unit root test

Notes: (1)*** denotes that it is significant at 1% level

(2) The lag order, p, is selected by the AIC or SC with the maximum order number being set to 1.

(3) Pesaran (2007) test is performed by "multipurt" command written by Markus Eberhardt

4.3 Westerlund and Edgerton (2007) Panel Bootstrap Cointegration Test

We made use of Westerlund and Edgerton (2007) cointegration test to see whether there is cointegrating relationship between the variables regarding heterogeneity and cross-sectional dependency among the series. We took notice of bootstrap p-value due to cross-sectional dependency among the series. Therefore the null hypothesis (there is cointegration) was accepted in both constant and constant and trend model. So there was a cointegrating relationship between the variables.

Table 5: Results of Westerlund and Edgerton (2007) panel bootstrap cointegration test

Test	Constant			Constant+Trend		
	LM Statistic	Asymp. p-val	Bootst. p-val	LM Statistic	Asymp. p-val	Bootst. p-val
LM_N^+	1.589	0.056	0.838	5.511	0.000	0.162

no of bootstrap replications: 10000

4.4 Long Run Cointegrating Coefficients

The cointegrating coefficients was estimated with AMG estimator taking notices of cross-sectional dependency and heterogeneity and the results were displayed in Table 5. The findings revealed that indicated that trade openness affected financial development in overall panel in the long term, while financial development had no significant influence on development of financial sector in overall panel over the long term. Furthermore trade openness affected the development of financial sector in Bulgaria, Croatia, Poland, Romania and Slovenia on a country basis. On the other side, financial openness had positive influence on the development of financial sector in Estonia and Hungary, while financial openness had negative effect on the development of financial sector in Slovakia and Czech Republic.

Table 6: Long run cointegrating coefficients

Country	TO		FO	
	Coefficient	p-value	Coefficient	p-value
Bulgaria	0.5584871	0.014**	-0.7008112	0.789
Croatia	0.6702137	0.000***	1.720157	0.404
Czech Republic	0.1150511	0.192	-16.73685	0.000***
Estonia	-0.1324522	0.384	57.0628	0.003***
Hungary	-0.104258	0.142	3.761486	0.027**
Poland	0.4691245	0.000***	-12.10819	0.000***
Romania	0.1615308	0.033**	-0.2353123	0.550
Slovak Republic	0.0300388	0.824	-12.43162	0.000***
Slovenia	0.3001675	0.087*	2.866273	0.424
Panel	0.229767	0.017**	2.577547	0.723

***, **, * indicates that it is significant at 1%, 5% and 10% level respectively

4.5 Dumitrescu and Hurlin (2012) Causality Test

The causal interplay between openness and development of financial sector was investigated by the test developed by Dumitrescu and Hurlin (2012) and the findings were denoted in Table 7. The findings revealed a unilateral causality from financial openness to financial sector development.

Table 7: Results of causality test of Dumitrescu and Hurlin (2012)

Lags: 1			
Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.
DTO does not homogeneously cause DDCRD	0.87569	-0.46403	0.6426
DDCRD does not homogeneously cause DTO	1.69516	0.84281	0.3993
DFO does not homogeneously cause DDCRD	2.27301	1.76432	0.0777
DDCRD does not homogeneously cause DFO	1.26325	0.15402	0.8776
DFO does not homogeneously cause DTO	1.09921	-0.10757	0.9143
DTO does not homogeneously cause DFO	0.66881	-0.79394	0.4272
Lags: 2			
DTO does not homogeneously cause DDCRD	0.87864	-1.53296	0.1253
DDCRD does not homogeneously cause DTO	3.28484	0.82277	0.4106
DFO does not homogeneously cause DDCRD	15.1611	12.4499	0.0000
DDCRD does not homogeneously cause DFO		NA	NA
DFO does not homogeneously cause DTO	1.43269	-0.99053	0.3219
DTO does not homogeneously cause DFO		NA	NA

NA: non applicable

5. Conclusion

Financial development have been accepted as an important component of economic growth especially together with endogenous growth theories. In this regard many academicians have focused on the determinants behind the development of financial sector to attain growth. In this article, we investigated the influence of increasing openness as a result of accelerating globalization process on financial development in CEE countries which experienced an economic and political transformation in recent 30 years employing Westerlund and Edgerton (2007) panel bootstrap cointegration test and Dumitrescu and Hurlin (2012) causality test during 1996-2014 period. The results revealed that there was cointegrating relationship between openness and development of financial development. The cointegrating coefficients posed that trade openness affected the development of financial sector positively in overall panel over the long run, while financial development had no significant influence on development of financial sector in overall panel over the long run. Furthermore trade openness had positive influence on financial sector development in Bulgaria, Croatia, Poland, Romania and Slovenia on a country basis. On the other side, financial openness had positive impact on financial development in Estonia and Hungary, while financial openness had negative impact on financial development in Czech Republic and Slovak Republic.

So there no countries in the sample which both financial and trade openness affected positively. So our findings do not support SOH by Rajan and Zingales (2003). The effect of both indicators of openness on the financial sector development varies from country to country. Furthermore, the literature suggests that institutional and regulatory quality is necessary for positive interaction between openness and

development of financial sector. So we evaluated that insignificant and negative interaction among financial and trade openness and development of financial sector can be resulted from insufficient institution and regulatory development.

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