

REMITTANCES AND FINANCIAL DEVELOPMENT IN CENTRAL AND EASTERN EUROPEAN COUNTRIES

Bayar Yilmaz¹
Sezgin, H.F.²

ABSTRACT

Global capital flows have risen considerably during the past three decades. In this regard, Central and Eastern European countries have attracted significant amount of foreign capitals due to institutional and economic transformation and European Union membership and their financial sectors have expanded considerably. This study researches the impact of the remittances on the development of financial sector in Central and Eastern European countries during the 1996-2015 period employing LM bootstrap cointegration test of Westerlund and Edgerton (2007) and causality test of Dumitrescu and Hurlin (2012). The findings suggested that there was cointegrating relationship among remittances, trade openness and financial sector development. Furthermore, there was unidirectional causality from financial development to remittances.

Keywords: *remittances, trade openness, financial development, panel data analysis*

JEL Classification: *C33, F24, G20, 016*

1. Introduction

Globalization and increasing openness have raised the labor mobility together with the considerable expansions in transnational goods, services and capital flows. 3.4% of the global population (about 250 million people) has been working outside their mother countries (World Bank, 2016a). Increasing the number of migrant workers also has caused significant increases in the flows remittances. The flows of global remittances reached \$552.32 billion in 2015 from \$1.93 billion in 1970 and about 70% of the remittances flowed to the developing countries (World Bank, 2016b).

The remarkable expansion in the flows of global remittances has called attention to the researchers and policymakers and in turn a large number of studies researched the economic and social impacts of remittance such as economic growth, investment, financial development, poverty alleviation, inequality, and entrepreneurship (e.g., see Aggarwal et al., 2010; Shen et al., 2010; Bayar, 2015; and Azamet al., 2016). In this paper, we research the interaction between remittances and financial development for Central and Eastern European (CEE) countries for the period of 1996-2015. Remittances are generally money transfers from relatively richer regions to the relatively poorer regions and generally used for finance of basic consumption, education, entrepreneurial activities, and health and in turn have implications for economic growth,

¹ Usak University Faculty of Economics and Administrative Sciences/Department of Economics, Usak, Turkey, yilmaz.bayar@usak.edu.tr

² Istanbul University/Department of Industrial Engineering, Istanbul, Turkey, fsezgin@istanbul.edu.tr

financial development, poverty, inequality, and entrepreneurship. However, the relationship between remittances and financial sector can exhibit complementarity or substitutability depending on the use of remittances by the recipients (Gupta et al., 2009). Remittances can make a positive contribution to the development of financial sector if transfers of the remittances are made through financial institutions and/or the recipients use the coming funds in terms of financial investments. However, financial development and financial product range have influence on the decisions of the recipients at this point. But remittances also have potential to affect the development of financial sector negatively in case remittances are used as an alternative financing source in the economy against the financial sector (Giuliano and Ruiz-Arranz, 2009). Furthermore, remittances also can influence the development of financial sector negatively, if the transfers of remittances are implemented in informal channels to decrease the costs. Therefore, the net impact of the remittances on the development of financial sector may be varied from country to country.

CEE countries transited to open market economies from closed centrally planned economies as a result of the Communist Bloc's collapse as of late 1980s, and experienced an institutional and economic transformation and integrated with the European Union (EU). Integration with the EU and increasing global openness has encouraged many residents of the CEE countries to go abroad for work. This continuing process has led considerable increases in remittances flows to CEE countries. In this paper we research the interaction between remittances and financial sector development over the 1996-2015 period. In this context, the literature summary on the subject of the paper is given in the next section of the paper. Then data and method is explained in the third section of the paper. Empirical analysis is implemented and major findings are introduced in Section 4 and the study is concluded with Section 5.

2. Literature Review

The growing volume of remittance flows has encouraged the researchers to investigate the effects of considerable expansion in the remittances over the economy in micro and macro-respects. One of the most researched topics in the recent years is the impact of remittances on the development of financial sector considering the positive interaction between financial sector development and economic growth. The studies have generally reached that the remittances have had positive influence on the development of financial sector (e.g., see Gupta et al., 2009; Aggarwal et al., 2011; Demirgüç-Kunt et al., 2011; Kakhkharov, 2014; Shahzad et al., 2014; Kevin, 2016; and Karikari et al., 2016). However, some papers revealed that remittances affected the development of financial sector negatively (e.g., see Kumar, 2013; Brown et al., 2013; Githaiga and Kabiru, 2014)

In one of the early studies Gupta et al. (2009) researched the impact of remittances on the development of financial sector in 44 sub-Saharan African countries over the period 1975-2004 employing panel regression and discovered the remittances as a positive factor for the development of financial sector. On the other side, Aggarwal et al. (2011) researched the effect of remittances on the development of financial sector in 109 developing countries over the period 1975-2007 with regression analysis and revealed a strong positive relationship between remittances and financial sector development. Demirgüç-Kunt et al. (2011) also researched the impact of remittances on the development of banking sector in Mexico in 2000 employing panel regression and revealed a positive relationship between remittances and banking sector development.

In another study, Ajilore and Ikhide (2012) examined the effect of remittances on the

development of financial sector in selected African countries over the short and long term employing ARDL approach and revealed that remittances made a positive contribution to the development of financial sector in Cape Verde, Lesotho, and Senegal except Nigeria. Kumar (2013) also researched the interaction among remittances, trade openness, and financial development in Philippines over the period 1976-2010 with ARDL bounds approach and found that remittances affected the development of financial sector negatively, but trade openness had no significant influence on the development of financial sector. Brown et al. (2013) researched the impact of remittances on the development of financial sector in 138 countries during the period 1970-2005 employing panel regression and revealed a negative relationship between remittances and financial sector development in developing countries. Githaiga and Kabiru (2014) examined the impact of remittances on the development of financial sector during the 1982-2012 period in 31 countries employing dynamic panel regression and found that remittances had negative effect on the development of financial sector. Kakhkharov (2014) also researched the relationship between remittances and development of financial sector in 27 countries from CEE and former Soviet Union over the period 1996-2013 and discovered a positive relationship between remittances and financial sector development.

In another study, Shahzad et al. (2014) investigated the interaction between remittances and development of financial sector in South Asian countries over the period 1989-2011 employing dynamic panel regression and found a positive impact of remittances on the development of financial sector. Ojapinwa and Bashorun (2014) analyzed the impact of remittances on the development of financial sector in 32 countries from Sub-Saharan region during 1996-2010 period employing dynamic panel regression and revealed a complementary relationship between two variables, in other words the remittances fostered the development of financial sector. Kevin (2016) also analyzed the impact of remittances on the development of financial sector in sub-Saharan African countries over the 1970-2014 period employing panel regression and revealed that remittances made a positive contribution to the development of financial sector. Rana and Tasneem (2016) investigated the effect of remittances on financial development in five countries from South Asia employing panel cointegration test and discovered that remittances affected the financial sector positively over the long run. Lastly, Karikari et al. (2016) researched the interaction between remittances and financial sector development in 50 African developing countries employing panel regression and causality analysis and found that remittances affected the development of financial sector positively in the short run, and financial development was a significant factor for the attraction of remittances.

3. Data and Econometric Methodology

We researched the interaction among remittances, trade openness and financial sector development in CEE economies during the period 1996-2015 employing Westerlund and Edgerton (2007) LM bootstrap cointegration test and Dumitrescu and Hurlin (2012) causality test.

3.1. Data

The yearly data of domestic credit to private sector (% of GDP) was used as a proxy for financial sector development. On the other hand, personal remittances inflows and trade openness were employed as explanatory variables in the paper. Our study period and sample were determined by the data availability. The variables used in the econometric analysis, their symbols and data

sources were presented in Table 1.

Table 1. Data description

Variables	Description	Data Source
DCRD	Domestic credit to private sector (% of GDP)	World Bank (2016c)
REM	Personal remittances, received (% of GDP)	World Bank (2016d)
TO	Trade (% of GDP)	World Bank (2016e)

The software packages of E-Views 9.0, Stata 14.0, and Gauss 11.0 were used in the econometric analysis of the paper. The descriptive statistics and correlation matrix of the variables in the study are presented in Table 2. The correlation matrix showed that there was positive correlation between financial development and remittances and between financial development and trade openness.

Table 2. Descriptive statistics and the correlation matrix of the variables in the study

Variables	Obs.	Mean	Std. Dev.	Min	Max
DCRD	220	43.39763	20.76861	0.1858704	101.2876
REM	220	1.922921	1.759085	0.0272946	8.154229
TO	220	109.886	32.71504	46.19455	185.1639
		DCRD		REM	TO
DCRD		1.0000			
REM		0.3706		1.0000	
TO		0.4153		0.0572	1.0000

3.2. Econometric Methodology

Cross-sectional dependency and homogeneity among the variables are determinative for selection of the further econometric tests used in the empirical analysis such as unit root test and cointegration test. Therefore, first we tested cross-sectional independency among the series with LM test of Breusch and Pagan (1980), since cross-section dimension (N=11) is lower than time dimension (T=20) and tested homogeneity with adjusted delta tilde test of Pesaran and Yamagata (2008). Later, integration levels of the variables were analyzed with CIPS unit root test of Pesaran (2007) that takes notice of cross-sectional dependence. Then, the cointegrating relationship among remittances, trade openness and financial development was analyzed with LM bootstrap cointegration test of Westerlund and Edgerton (2007), because heterogeneity and cross-sectional dependence were found in econometric analysis of dataset. The cointegrating coefficients was estimated by Augmented Mean Group (AMG) estimator (see Eberhardt and Bond (2009), Eberhardt and Teal (2010, 2011)) after the cointegrating relationship among the variables was found. Finally, the causal interaction among remittances, trade openness, and financial sector development were investigated with the causality test of Dumitrescu and Hurlin (2012).

4. Empirical Analysis

4.1. Cross-sectional dependency and homogeneity tests

We tested cross-sectional independence among the series with LM test of Breusch and Pagan (1980) because time dimension (T=20) is higher than cross-section dimension (N=11) and the results were displayed in Table 3. The null hypothesis, there is cross-sectional independency,

was rejected at 1% significance level, because p value was found to be 0.0000. So we revealed cross-section dependence among the series. Furthermore, we analyzed homogeneity with adjusted delta tilde test of Pesaran and Yamagata (2008) and our findings revealed that null hypothesis, there is homogeneity, was rejected 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))	242.1	0.000
LM CD (Pesaran (2004))*	12.570	0.000
LM adjusted (Pesaran et al. (2008))*	39.73	0.000
Homogeneity tests		
Test	Statistic	p-value
Delta_tilde	10.849	0.000
Delta_tilde_adj	12.058	0.000

*two-sided test

4.2. Panel Unit Root Tests

We analyzed the integration levels of the variables by Maddala and Wu (1999) panel unit root test and Pesaran (2007) CIPS (Cross-sectionally augmented IPS (Im-Pesaran-Shin (2003)) unit root tests. CIPS panel unit root test considers cross-sectional dependence, while Maddala and Wu (MW) (1999) panel unit root test does not regard cross-sectional dependence. The tests were implemented and the results were given in Table 4. All the variables were found to be I(1) with regard to the results of the test.

Table 4. Results of panel unit root tests

Variables	MW (1999) panel unit root test		CIPS panel unit root test	
	Constant	Constant + Trend	Constant	Constant + Trend
DCRD	18.568 (0.672)	8.055 (0.997)	1.201 (0.885)	2.610 (0.995)
d(DCRD)	42.412 (0.006)***	30.654 (0.103)	-2.998 (0.001)***	-3.505 (0.000)***
REM	14.611 (0.878)	12.486 (0.947)	0.259 (0.602)	0.457 (0.676)
d(REM)	68.624 (0.000)***	43.842 (0.004)***	-1.874 (0.030)**	-1.017 (0.155)
TO	8.659 (0.995)	57.612 (0.000)***	-2.147 (0.016)	1.084 (0.861)
d(TO)	122.054 (0.000)***	80.924 (0.000)***	-4.956 (0.000)***	-3.121 (0.001)***

*** significance at 1% level

Optimal lag length was selected as 1 considering LR, FPE, AIC, SC and HQ

4.3. Westerlund and Edgerton (2007) LM bootstrap cointegration test

The cointegrating relationship among remittances, trade openness and financial sector development was analyzed with LM bootstrap cointegration test of Westerlund and Edgerton (2007) and the results were displayed in Table 5. Furthermore, the critical values were provided with 10,000 simulations and lag and lead values were taken as 1. Table 5 indicated that the null hypothesis (there is cointegrating relationship among the variables) should be accepted considering the bootstrap p-values due to the existence of the cross-sectional dependence among the variables. So we concluded that there was a long run relationship among the variables.

Table 5. Results of Westerlund and Edgerton (2007) LM bootstrap cointegration test

LM_N^+	Constant			Constant and Trend		
	Test statistic	Asymptotic p-value	Bootstrap p-value	Test statistic	Asymptotic p-value	Bootstrap p-value
	2.077	0.019	0.780	6.248	0.000	0.273

The cointegrating coefficients were estimated by AMG estimator which regards heterogeneity and cross-sectional dependency and the findings were displayed in Table 6. The results indicated that both remittances and trade openness had no significant impact on the development of financial sector at the level of overall panel. However, at the country level, remittances had positive impact on the development of financial sector in Estonia, Latvia, and Lithuania over the long run, while remittances had negative impact on financial sector development in Hungary, Poland, and Slovakia over the long run. On the other side, trade openness had positive impact on the development of financial sector in Bulgaria, Croatia, Poland, Romania, and Slovenia over the long run, while trade openness had negative impact on the development of financial sector in Czech Republic, Estonia, and Lithuania over the long run.

Table 6. Long run cointegrating coefficients

Country	REM		TO	
	Coefficient	p-value	Coefficient	p-value
Bulgaria	0.5650007	0.562	0.4703894	0.000
Croatia	3.078825	0.242	0.5125724	0.005
Czech Republic	0.5739605	0.972	-0.3864864	0.082
Estonia	11.4576	0.000	-0.2958606	0.001
Hungary	-3.943598	0.030	0.1028453	0.153
Latvia	7.03639	0.000	-0.0691178	0.634
Lithuania	5.406372	0.000	-0.1821323	0.006
Poland	-9.380014	0.000	0.3707696	0.001
Romania	-0.8045649	0.520	0.1536592	0.060
Slovakia	-17.11702	0.008	0.1572298	0.458
Slovenia	-10.48914	0.197	0.3558171	0.009
Panel	-1.237836	0.626	0.1081533	0.245

4.4. Dumitrescu and Hurlin (2012) Causality Test

The causal interaction among remittances, trade openness and financial sector development was tested with the causality test of Dumitrescu and Hurlin (2012) and the findings were presented in Table 7. The findings indicated that there was unidirectional causal relationship from financial sector development to remittances, because null hypothesis was rejected. So the development of financial sector is an important instrument in attraction of remittances.

Table 7. Causality test results

Lags=1			
Null hypothesis	W-Stat.	Zbar-Stat.	Prob.
$DREM \Rightarrow DDCRD$	0.73976	-0.74603	0.4557
$\Delta DDCRD \Rightarrow DREM$	1.87488	1.29904	0.1939
$DTO \Rightarrow \Delta DDCRD$	1.24362	0.16175	0.8715
$\Delta DDCRD \Rightarrow DTO$	1.61681	0.83409	0.4042
$DTO \Rightarrow DREM$	0.45957	-1.25083	0.2110

$DREM \rightarrow DTO$	1.13457	-0.03472	0.9723
Lags=2			
Null hypothesis	W-Stat.	Zbar-Stat.	Prob.
$DREM \rightarrow DDCRD$	1.36666	-1.16595	0.2436
$\Delta DDCRD \rightarrow DREM$	3.86769	1.65605	0.0977
$DTO \rightarrow \Delta DDCRD$	1.56527	-0.94185	0.3463
$\Delta DDCRD \rightarrow DTO$	1.90782	-0.55534	0.5787
$DTO \rightarrow DREM$	1.29037	-1.25204	0.2106
$DREM \rightarrow DTO$	1.51392	-0.99980	0.3174

Conclusions

We analyzed the impact of remittances and trade openness on the development of financial sector in 11 CEE countries over the period 1996-2015 employing LM bootstrap cointegration test of Westerlund and Edgerton (2007) and causality test of Dumitrescu and Hurlin (2012). The findings suggested that there was cointegrating relationship among remittances, trade openness and financial sector development. But the long run cointegrating coefficients of the panel showed that both remittances and trade openness had no significant impact on the development of financial sector. However, at the country level remittances had positive impact on financial sector development in Estonia, Latvia, and Lithuania over the long run, while remittances had negative impact on financial sector development in Hungary, Poland, and Slovakia over the long run. On the other side trade openness had positive impact on financial sector development in Bulgaria, Croatia, Poland, Romania and Slovenia over the long run, while trade openness had negative impact on the financial sector development in Czech Republic, Estonia and Lithuania over the long run. Furthermore, there was unidirectional causality from financial development to remittances.

Our findings match up with the theoretical propositions and the empirical findings. Increases in the flows of remittances foster the development of financial sector in Estonia, Latvia, and Lithuania, while the remittances affect the development of financial sector negatively in Hungary, Poland, and Slovakia. However, the development level of financial sector is an important factor for attracting the remittances in the short run. Therefore, we evaluate that remittances begin to make a positive contribution to the development of financial sector after the financial sector has reached a certain threshold of financial development. So policymakers should take measures to achieve this development level of financial sector for attraction of the remittances considering its positive impact on economic growth and financial development.

References

1. Aggarwal, R., Demirgüç-Kunt, A., Martínez-Pería, M.S. (2011). Do remittances promote financial development? *Journal of Development Economics*, 96, 255–264.
2. Ajilore, T., Ikhide, S. (2012). A bounds testing analysis of migrants remittances and financial development in selected Sub-Sahara African countries. *Review of Finance and Banking*, 4(2), 79-96.
3. Azam, M., Haseeb, M., Samsudin, S. (2016). The impact of foreign remittances on poverty alleviation: Global evidence. *Economics and Sociology*, 9(1), 264-281.

4. Bayar, Y. (2015). The impact of remittances on the economic growth in the transitional economies of the European Union. *Economic Insights – Trends and Challenges*, 67(3), 1-10.
5. Breusch, T. S., Pagan, A.R. (1980). The Lagrange multiplier test and its applications to model specification tests in econometrics. *Review of Economic Studies*, 47(1), 239–53.
6. Brown, P.C., Carmignani, F., Fayad, G. (2013). Migrants’ remittances and financial development: Macro- and micro-level evidence of a perverse relationship. *World Economy*, 36(5), 636–660.
7. Demirgüç-Kunt, A., Córdova, E.L., Martínez-Pería, M.S., Woodruff, C. (2011). Remittances and banking sector breadth and depth: Evidence from Mexico. *Journal of Development Economics*, 95, 229–241.
8. Dumitrescu, E., Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling*, 29(4), 1450–1460.
9. Eberhardt, M., Bond, S. (2009). Cross-section dependence in nonstationary panel models: A novel estimator. Retrieved from <https://mpra.ub.uni-muenchen.de/17870/> (26.11.2016).
10. Eberhardt, M., Teal, F. (2010). Productivity analysis in global manufacturing production. University of Oxford Department of Economics Discussion Paper Series Number 515. Retrieved from <http://www.economics.ox.ac.uk/materials/papers/4729/paper515.pdf> (26.11.2016).
11. Eberhardt, M., Teal, F. (2011). Econometrics for grumblers: A new look at the literature on cross-country growth empirics. *Journal of Economic Surveys*, 25(1), 109-155.
12. Githaiga, P.N., Kabiru, C.G. (2014). Remittances as a determinant of financial sector development. *Journal of Business, Economics & Finance*, 3(4), 398-424.
13. Giuliano, P., Ruiz-Arranz, M. (2016). Remittances, financial development, and growth. *Journal of Development Economics*, 90, 144–152.
14. Gupta, S., Pattillo, C.A., Wagh, S. (2009). Effect of remittances on poverty and financial development in Sub-Saharan Africa. *World Development*, 37(1), 104–115.
15. Im, K.S., Pesaran M. H., Shin Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115(1), 53-74.
16. Kakhkharov, J. (2014). The impact of remittances on financial development: The case of transition economies of Central & Eastern Europe and the former Soviet Union. Griffith Business School Discussion Papers-Economics, No. 2014-09.
17. Karikari, N.K., Mensah, S., Harvey, S.K. (2016). Do remittances promote financial development in Africa? *SpringerPlus* (2016) 5, 1-21.
18. Kevin, W. (2016). Remittances and financial development: Evidence from Sub-Saharan Africa. *African Development Review*, 28(3), 357-367.
19. Kumar, R.R. (2013). Linking remittances with financial development and ICT: a study of the Philippines. *International Journal of Economics and Business Research*, 5(4), 379-399.
20. Maddala, G.S. and Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics*, 61(S1), 631-652.
21. Ojapinwa, T.V., Bashorun, O.T. (2014). Do workers’ remittances promote financial development in Sub-Sahara Africa countries? *International Journal of Financial Research*, 5(2), 151-159.
22. Pesaran, M. H. (2004). General diagnostic tests for cross section dependence in panels. CESifo Working Papers No.1233, 255–260.
23. Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics*, 22(2), 265-312.
24. Pesaran, M. H., Yamagata, T. (2008). Testing slope homogeneity in large panels. *Journal of Econometrics*, 142(1), 50–93.
25. Pesaran, M.H., Ullah, A., Yamagata, T. (2008). A bias-adjusted LM test of error cross-section independence. *Econometrics Journal*, 11(1), 105–127.

26. Rana, R.H., Tasneem, F. (2016). Does remittance inflow promote financial development in South Asia? *Asian Journal of Social Sciences & Humanities*, 5(2), 86-100.
27. Shahzad, S.J.H., Adnan, N., Ali, S., Raza, N. (2014). The impact of remittances on financial development in South Asia. *Review of Economic and Business Studies*, 7(2), 11-29.
28. Shen, I-L., Docquier, F., Rapoport, H. (2010). Remittances and inequality: a dynamic migration model. *Journal of Economic Inequality*, 8(2), 197–220.
29. Westerlund, J., Edgerton, D.L. (2007). A panel bootstrap cointegration test. *Economics Letters*, 97(3), 185-190.
30. World Bank (2016a). Migration and remittances: Recent developments and outlook. Washington: World Bank.
31. World Bank (2016b). Personal remittances, received (current US\$), <http://data.worldbank.org/indicator/BX.TRF.PWKR.CD.DT> (20.02.2017)
32. World Bank (2016c). Domestic credit to private sector (% of GDP). Retrieved from <http://data.worldbank.org/indicator/FS.AST.PRVT.GD>. (31.10.2016)
33. World Bank (2016d). Personal remittances received (% of GDP). Retrieved from <http://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS> (31.10.2016)
34. World Bank (2016e). Trade (% of GDP). Retrieved from <http://data.worldbank.org/indicator/NE.TRD.GNFS.ZS> (31.10.2016)