

## What determines the portfolio investment flows to Central and Eastern European Countries in the European Union 2001-2017?

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**Abstract.** *This study estimates whether the Central and Eastern European (CEE) financial market integration and higher trade flows can explain the foreign portfolio investment inflows since EU accession during 2001-2017. The results suggest that the stock market development has facilitated the foreign portfolio equity flows during the European Union (EU) and crisis periods. But it only has positive effect on the foreign portfolio debt flows during the EU period. In contrast, the banking sector development has very weak effect on the foreign portfolio investment. The higher bank development has only increased the foreign portfolio equity flows during the EU period.*

**Keywords:** economic integration; European Union; portfolio investment; financial market.

**JEL Classification:** F15; F36; G15.

## 1. Introduction

The European Union (EU) countries deepened their financial integration by forming the Economic and Monetary Union (EMU) in 1992. The EMU reduced exchange rate uncertainty through euro adoption and facilitated monetary policy convergence. They played a crucial role in accelerating the financial market integration among the eurozone countries. Their financial market efficiency substantially improved because of the higher competition. More importantly, the EMU further boosted capital flows among the eurozone countries and the rest of the world (Lane and Milesi-Ferretti, 2008). In particular, the high level of capital flows had helped Central and Eastern Europe (CEE) countries to achieve high economic growth for the past two decades.

The objective of this study is to identify the main determinants of foreign portfolio investments in the CEE countries during 2001-2017. First, this study examines whether the CEE financial market development has facilitated the higher foreign portfolio investment inflows. Most of these countries have established more efficient financial markets since EU and EMU accession. The EU has contributed to the equity and bond market integration (De Santis and Gerard, 2009). The euro launch triggered by the EMU has further increased the depth and liquidity of the eurozone financial markets (Giofre, 2012). The larger stock markets and more efficient banking sectors have positive impact on the foreign portfolio investment inflows (Broto et al., 2011; Schmitz, 2011). This study analyzes whether the higher CEE financial market development due to EU and EMU integration has boosted the foreign portfolio investment inflows since 2004. Moreover, this study also examines the financial crisis impact on the foreign portfolio investment inflows during 2010-2017. Compared to the developed countries, the developing countries experienced quicker rebound in capital inflows after the 2008 financial crisis (Calderon and Kubota, 2019). The countries' macroeconomic conditions and institutional qualities were crucial factors for foreign capital inflows during the recovery period (McQuade and Schmitz, 2017). This study focuses on whether the CEE countries experienced quick rebound in foreign portfolio investments during the recovery period 2010-2017.

Second, this study examines whether the trade flows have contributed to the higher foreign portfolio investments in the CEE countries. In particular, they have maintained very stable export growth because of their access to western EU countries since EU accession. The high trade flows have boosted foreign portfolio investments in the CEE countries because high trade transactions have made the trading partners more familiar with the CEE investment environment (Lane and Milesi-Ferretti, 2008). The EU trade integration has helped the CEE countries to boost more foreign portfolio investments from western EU countries. The growing CEE trade flows with the rest of the world have also contributed to more portfolio investment inflows. This study analyzes whether the higher trade flows have promoted the foreign portfolio investments in the CEE countries.

This study contributes to the literature in two respects. First, this is the first study to examine the impact of financial market development on foreign portfolio investments in the CEE countries. The stock market development has positive relationship with foreign portfolio investments in developing countries. Those with much larger and more

developed stock markets would have more stable level of portfolio investment inflows. The banking sector development also has similar relationship with foreign portfolio investments. The high level of bank credit flows would result in more stable level of portfolio investment inflows (Broto et al., 2011). The financial deregulations that reduce transaction costs would increase the availability of various financial instruments. This would make countries' banking system more appealing to global capital flows. This in turn would make them more likely to hold a larger amount of foreign portfolio investments (Araujo et al., 2015). This supports the argument that developing countries such as the CEE countries with financially open economies would receive net capital inflows while developed countries experience net capital outflows (Reinhardt et al., 2013). Due to EMU accession, the CEE countries received the higher level of foreign portfolio investments from western EU countries during 2008-2015. If the results of this study confirm the positive impact of financial market development on foreign portfolio investments, the CEE countries should further improve their financial market efficiency. This study would also provide valuable suggestions on the long-term policies for CEE financial market development. Second, this is the first study to identify the major factors that facilitated the increase in foreign portfolio investments in the CEE countries after the 2008 financial crisis and 2010 eurozone debt crisis. The main drivers of capital flows during the recovery period 2010-2012 included the developing countries' macroeconomic fundamentals, institutional qualities and policies. In contrast, the financial openness which made the developing countries vulnerable to common global shocks played little or no role in affecting the capital flow volatility in the CEE countries (Fratzscher, 2012). Based on these arguments, the macroeconomic conditions would determine the rebound in foreign portfolio investments during the recovery period. Consistent with the expectation, the developing countries such as the CEE countries experienced much quicker rebound in foreign portfolio investments than banking flows and foreign direct investments after the crisis (Milesi-Ferretti and Tille, 2011). As seven of the CEE countries joined the eurozone during 2008-2015, their integrated financial markets such as equity markets have become more important in the world market since the mid-1990s as their financial market expansion has continued in terms of size and liquidity (Fratzscher, 2002). It is important to identify the major factors that can boost the foreign portfolio investment to the pre-crisis level in these countries. If the results of this study confirm the importance of macroeconomic conditions on foreign portfolio investments, the CEE countries should develop more effective economic policies to withstand financial crisis. This study would provide important suggestions for implementing good economic policies in the long run.

The rest of the article is organized as follows. The next section reviews the previous studies on foreign portfolio investments. Section 3 describes the analytical framework and estimation model for the determinants of foreign portfolio investments in the CEE countries. Section 4 presents the results and discusses their significance. Section 5 provides important implications for the long-term policies to attract more foreign portfolio investments. Section 6 concludes.

## 2. Literature review

Most of the previous studies have confirmed the positive impact of the EMU on foreign portfolio investment. An earlier study argued that the EMU which eliminated the exchange rate risk and reduced transaction costs for cross-border capital flows boosted the intra-eurozone portfolio investments (Haselmann and Herwartz, 2010). Another study found that eurozone investors reallocated more portfolio investment flows to other eurozone countries than investors from other countries. The EMU substantially eased the access of eurozone investors to the entire eurozone markets (De Santis and Gerard, 2009). Due to EMU accession, the deepened financial integration contributed to the growing importance of eurozone equity markets in the world since the mid-1990s. The more integrated eurozone financial markets made themselves more attractive places for foreign investments (Fratzscher, 2002). Moreover, the EMU contributed to strong convergence among the eurozone equity portfolios. The convergence in bilateral investment barriers facilitated by the euro adoption mainly consolidated the portfolio convergence among the eurozone countries (Giofre, 2012). A more recent study reached similar conclusion. The developing countries with financially open economies experienced net capital inflows while more developed countries experienced net capital outflows. This result still held true after controlling for various determinants of current account (Reinhardt et al., 2013).

Previous studies have analyzed the effect of financial market development on foreign portfolio investments. The more developed stock markets and banking sectors facilitated asset trade among local residents which thereby reduced the need for foreign portfolio investments. But financial market development might be spurred by foreign investments in domestic financial system (Lane and Milesi-Ferretti, 2008). The higher financial market development measured by financial market capitalization strongly affected foreign portfolio investment inflows (Mandilaras and Popper, 2009). A more recent study confirmed the direct relationship between stock market development and foreign portfolio investments. The smaller stock market size was associated with higher volatility of portfolio investment flows. As the stock markets became more developed, the portfolio investment flows became more stable. The banking sector development has similar relationship with volatility of portfolio investment flows. The more developed banking sectors in terms of higher banking credit and deposit flows were associated with more stable portfolio investment flows (Broto et al., 2011). Moreover, the banking sector reforms were associated with high capital inflows. Due to EU accession, the EU countries with banking sector reforms received more foreign portfolio investment inflows (Schmitz, 2011). The EU membership since 2004 substantially improved the financial sector quality in the CEE countries by upgrading their legal, regulatory, and supervisory frameworks comparable to those in western EU countries (Von Hagen and Zhang, 2014).

More related studies have explored the impact of trade flows on foreign portfolio investments. The high trade linkage helped foreign investors to gain more information over host countries, which increased their willingness to increase foreign portfolio investments in these countries (Lane and Milesi-Ferretti, 2008; De Santis and Gerard, 2009). The higher bilateral trade flows had positive impact on bilateral foreign capital flows. When two countries traded more with each other, they also held higher shares of

each other's foreign assets which provided a better hedge for output risks (Peter, 2012). Similar study confirmed the positive trade effect on foreign portfolio investments. The countries that had close trade ties with the United States invested more portfolio investments in the United States (Forbes, 2010). Another study concluded that trade flows and financial capital flows reinforced each other. Hence, countries could boost portfolio investment flows by better coordinating trade policies and capital liberalization policies (Aviat and Coeurdacier, 2007).

Finally, a related strand of literature has tried to identify the main factors that can minimize the impact of financial crisis on foreign portfolio investments. First, the countries with high debt burden suffered more decline in capital inflows during the crisis. In contrast, the countries with low dependence on external finance were less affected by the capital flow volatility (Milesi-Ferretti and Tille, 2011). A later study posited that the countries' macroeconomic conditions, institutional qualities, and policies were the major determinants of capital flows during the crisis recovery period 2009-2010 (Fratzscher, 2012). A similar study suggested that the eurozone countries that were severely affected by the 2010 eurozone debt crisis should replace their financial supervision institutions by forming supranational institutions capable of managing and resolving financial crises (Sapir, 2011). This study would extend the literature to focus on foreign portfolio investment patterns in developing countries. It examines whether the CEE financial market development has played a crucial role in facilitating the foreign portfolio investments after EU accession.

### 3. Econometric specification

#### 3.1. Analytical framework

This study will identify the main determinants of foreign portfolio investments in the CEE countries during 2001-2017. The model derives from the gravity model which primarily explains the bilateral trade flows by distance between trading countries and gross domestic products (Tinbergen, 1962). The gravity model has also been applied in the analysis of foreign capital flows. This study modifies the gravity model by adding the CEE financial development and conventional variables such as trade flow. It analyzes whether the higher financial market development and trade flows can explain the foreign portfolio investments in the CEE countries.

First, the euro launch triggered by the EMU creation has deepened the financial market integration among the eurozone countries (Giofre, 2012). The more integrated financial markets would reduce transaction costs and hence further boost cross-border trade in financial assets (Lane, 2000). More importantly, the larger stock markets would lead to more stable foreign portfolio investment inflows (Broto et al., 2011). The euro launch has also increased the depth and liquidity of the eurozone financial markets. The CEE stock markets have further expanded due to their stock market integration with western EU countries. The larger and more liquid CEE stock markets have made themselves more attractive places for foreign portfolio investments. The modified model examines whether the higher CEE stock market development can explain the foreign portfolio investment

inflows. The stock market capitalization is a good measure to predict capital flow volume (Portes and Rey, 2005). The CEE stock market development is measured by the stock market capitalization (*MktCap*).

Similar to the stock market development, the CEE banking sector development also has positive relationship with foreign portfolio investment inflows. The more developed banking sectors measured by their bank credits and deposits would lead to more stable foreign portfolio investment inflows (Broto et al., 2011). Given high economic growth potential, developing countries would experience higher inflows from developed countries (Schmitz, 2011). Due to EU accession, the CEE countries with bank liberalization have received more foreign portfolio investments. More importantly, EU accession has increased the CEE banking sector efficiency through upgrading their legal, regulatory, and supervisory frameworks comparable to those in western EU countries. Besides, the high foreign bank presence in these countries has substantially improved the quality of their banking sectors (Hagen and Zhang, 2014). The modified model examines whether the CEE banking sector development can affect the foreign portfolio investment inflows. The CEE banking sector development is measured by the domestic bank credits to private sector (*BankCred*).

Finally, the trade flows can influence the foreign portfolio investments in the CEE countries. The higher trade flows among trading countries would boost their bilateral investment flows (Pericoli et al., 2013). Two countries that trade more with each other tend to hold higher shares of each other's financial assets. The reason is that these assets provide a better hedge for output risks (Peter, 2012). The higher trade transactions would allow trading partners to know more about their investment environments, which would increase their willingness to make investments in these countries (De Santis and Gerard, 2009; Lane and Milesi-Ferretti, 2008). The higher trade flows in the CEE countries would attract more foreign portfolio investments from their major trading partners. The modified model examines whether the higher trade flows would increase the foreign portfolio investment inflows. The trade flows between the CEE countries and their trading partners are measured by the sum of exports and imports as a percentage of CEE GDP (*Trade*).

### 3.2. Empirical model

This study modifies the gravity model to identify the main determinants of foreign portfolio investments in the CEE countries during 2001-2017. The model estimates whether the CEE deeper financial market integration and higher trade flows can explain the foreign portfolio investments since EU accession. The regression equations are given as:

$$\begin{aligned} \log(\text{Portfolio}_{it}) = & \alpha + \beta_1 \log(\text{MktCap}_{it}) + \beta_2 \log(\text{BankCred}_{it}) + \beta_3 \log(\text{Trade}_{it}) + \\ & + \beta_4 \log(\text{FDI}_{it}) + \beta_5 \log(\text{Manuf}_{it}) + \beta_6 \log(\text{GDPPC}_{it}) + \beta_7 \log(\text{NFA}_{it}) + \\ & + \beta_8 \log(\text{GovDebt}_{it}) + \beta_9 \log(\text{HiTech}_{it}) + \beta_{10} \log(\text{PopSize}_{it}) + \beta_{11} \log(\text{FinFree}_{it}) + \\ & + \beta_{12} (\text{Saving}_{it}) + \varepsilon_{it} \end{aligned} \quad (1)$$

$$\begin{aligned} \log(\text{Portfolio}_{it}) = & \alpha + \beta_1 \log(\text{MktCap}_{it}) + \beta_2 \log(\text{DomCred}_{it}) + \beta_3 \log(\text{Trade}_{it}) + \\ & + \beta_4 \log(\text{FDI}_{it}) + \beta_5 \log(\text{Manuf}_{it}) + \beta_6 \log(\text{GDPPC}_{it}) + \beta_7 \log(\text{NFA}_{it}) + \\ & + \beta_8 \log(\text{GovDebt}_{it}) + \beta_9 \log(\text{HiTech}_{it}) + \beta_{10} \log(\text{PopSize}_{it}) + \beta_{11} \log(\text{FinFree}_{it}) + \\ & + \beta_{12} (\text{Saving}_{it}) + \varepsilon_{it} \end{aligned} \quad (2)$$

where  $Portfolio_{it}$  is the level of the foreign portfolio equity and debt investments in the CEE country  $i$  in time period  $t$  (2001-2017). All variables are measured in US dollars adjusted for inflation to the base year 2005. The CEE countries in this study refer to eleven Central and Eastern European countries (Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia) and two Mediterranean countries (Cyprus and Malta). All of the CEE countries except Bulgaria, Croatia and Romania joined the EU in 2004. Bulgaria and Romania joined the EU in 2007 and Croatia followed suit in 2013. Moreover, seven CEE countries (Slovenia, Cyprus, Malta, Slovakia, Estonia, Latvia, and Lithuania) ultimately adopted the euro currency between 2007 and 2015. Although the CEE countries only joined the EU and EMU in 2004 and 2007, EU and EMU accession facilitated their financial market integration through the elimination of currency conversion risk. The anticipated EMU effect bolstered the growing importance of eurozone equity markets since the mid-1990s. The more integrated CEE financial markets made themselves more attractive places for foreign investments (Fratzscher, 2002). The main focus of this study is to examine the impact of the CEE financial market development on foreign portfolio investments in the CEE countries during the EU and EMU periods 2005-2017. This study also runs data analysis for the earlier period 2001-2004 to see whether the anticipated EU and EMU effects can explain the higher foreign portfolio investments in these countries.

The main explanatory variables in equations (1) and (2) are the stock market and banking sector development variables ( $MktCap$  and  $BankCred$ ).  $MktCap$  is the stock market capitalization variable. It is the total value of stocks listed on the domestic market divided by CEE GDP. It measures the stock market size relative to the economy. EU accession has deepened the financial liberalization among the CEE countries. Their stock market expansion due to the stock market reforms has attracted more foreign portfolio investments (Schmitz, 2011). The larger stock market size would result in higher foreign portfolio investment in the CEE countries. Second,  $BankCred$  is the bank credit flow variable. It is the domestic credit provided by deposit money banks to private sectors as a share of CEE GDP. A larger amount of bank credits indicates a higher level of financial services and banking sector development. The foreign bank entry facilitated by EMU accession has further boosted the bank credit supply in the CEE countries. The CEE eurozone countries have received more foreign bank credits from western eurozone countries (Moral-Benito and Roehn, 2016). The larger bank credit supply would lead to higher foreign portfolio investments in the CEE countries. To test for the robustness of the results, the model would include the banking sector variable ( $DomCred$ ) which measures the domestic credits provided by financial intermediaries to private sector as a share of CEE GDP. The variable only measures the total credits issued to the private sectors, but excludes credits issued to governments and public agencies. The euro launch has facilitated the banking sector liberalization among the member countries. This has boosted the country's holding of foreign portfolio investment inflows (Araujo et al., 2015). Hence, the larger domestic credit flows would result in higher foreign portfolio investments in the CEE countries.

Another related variable is the level of financial market competition that can strongly affect the foreign portfolio investment inflows. The financial freedom ( $FinFree$ ) variable measures the financial freedom scores of the CEE countries. An efficient financial system

ensures the availability of diversified savings, credit, payment, and investment services to individuals and businesses. To facilitate financial market competition, government should regulate banking institutions to ensure transparency and integrity and promote disclosure of assets, liabilities, and risks (Miller et al., 2019). Developing countries with financially open economies would experience net capital inflows while developed countries would experience net capital outflows (Reinhardt et al., 2013). The EMU has accelerated the financial liberalization in the CEE countries. The higher financial freedom would lead to higher foreign portfolio investments in these countries.

Another major concern is whether trade flow is one of the crucial determinants for foreign portfolio investment. *Trade* is the amount of CEE exports and imports divided by CEE GDP. It reflects the trade linkages between the CEE countries and their trading partners. The higher bilateral trade flows would result in higher bilateral capital flows (Pericoli et al., 2013). The close trading partners tend to hold higher shares of each other's capitals as they provide better hedge for output risks (Peter, 2012). Another reason why trade boosts portfolio investment is that higher trade linkages would improve information flows over host countries and thereby increase the willingness to make foreign portfolio investment (Lane and Milesi-Ferretti, 2008; De Santis and Gerard, 2009). EU accession has boosted the CEE trade flows with western EU countries. Moreover, their trade flows with the rest of the world have also increased because foreign countries exporting to the CEE countries have gained full access to the rest of the EU markets. Higher CEE trade openness would lead to higher foreign capital flows in the CEE countries (Schmitz, 2011). Hence, the higher trade flows would result in higher foreign portfolio investments in these countries.

Similar to the trade variable, the foreign direct investment (*FDI*) variable has positive effect on foreign portfolio investment in the CEE countries. *FDI* is the total amount of the foreign direct investments in the CEE countries. Compared to portfolio investment, FDI has a rather long-term nature and tends to be associated with domestic investment and economic growth. It is generally less volatile and more persistent than non-FDI inflows (Broto et al., 2011). But foreign investors would need to pay high information cost to make FDI in host countries. The cost would increase when distance between home and host countries increases (Guerin, 2006). The high FDI transactions would provide foreign investors with valuable information about the CEE countries, which would substantially reduce the information cost in making foreign portfolio investments in these countries. Therefore, the higher FDI inflows would have positive impact on foreign portfolio investments in the CEE countries.

Manufacturing output (*Manuf*) variable can have substantial effect on foreign portfolio investment. It is the share of manufacturing output in total output. If developing countries have higher share of manufacturing output, it would suggest their high dependence on export revenues. The external economic shocks would make their export revenues more volatile (Milesi-Ferretti and Tille, 2011). Since the late 1990s, the CEE countries focused on developing manufacturing industries to boost their economic growth. However, when their major export markets such as western EU countries experienced severe economic slowdown, the CEE export revenues substantially decreased because of the sharp drop in

demand for their exports. Their low economic growth due to poor performance in manufacturing industries would deter foreign portfolio investment inflows. Hence, the declining share of manufacturing output in total output would lead to lower foreign portfolio investments in the CEE countries.

Several conventional variables can explain the foreign portfolio investments in the CEE countries. First, the gross domestic product per capita (*GDPPC*) variable measures the level of economic development of the CEE countries. The level of economic development would have different impacts on foreign portfolio investments. Developing countries measured by their lower GDP per capita level would receive larger foreign portfolio investment inflows. This is consistent with the concept of downhill net financial flows to relatively poorer countries (Schmitz, 2011). On the other hand, developed countries would receive much less foreign portfolio investment than developed countries because the former have less safer investment environments. They are more likely to experience a capital flow turnaround (Milesi-Ferretti and Tille, 2011). Therefore, the level of economic development may have either positive or negative impact on foreign portfolio investment in the CEE countries. Similar to the *GDPPC* variable, the population size (*PopSize*) variable is also considered as economic size variable. It refers to the total population of the CEE countries which include all residents regardless of their citizenship. The larger size countries would attract more foreign capital inflows as they offer more diversification opportunities (Papaioannou, 2009). The larger population size would result in higher foreign portfolio investment in the CEE countries.

Second, the government debt (*GovDebt*) variable indicates the total government debt as a percentage of CEE GDP. It reflects the macroeconomic fundamentals of the CEE countries. Those countries with strong macroeconomic fundamentals would receive more stable foreign portfolio investment as they can better insulate their financial markets from financial crisis (Fratzscher, 2012). The stronger macroeconomic fundamentals reflected by lower value in *GovDebt* would bolster foreign investors' confidence in the CEE countries. Hence, this would likely increase foreign portfolio investment in these countries. A similar variable to measure country's debt level is the net foreign assets (*NFA*) variable. It measures the sum of foreign assets held by monetary authorities and deposit money banks but excludes their foreign liabilities. It is equal to the cumulative changes in its current account. The *NFA* position indicates whether the country is a net creditor or debtor to the rest of the world. A positive *NFA* balance means that it is a net lender while a negative *NFA* balance shows that it is a net borrower. The higher debt level would deter foreign portfolio investment in the CEE countries.

Third, the high-technology exports measure the research and development capabilities of CEE countries. The high-technology export proportion (*HiTech*) variable is equal to the total amount of high-technology exports as a percentage of CEE GDP. High technology exports reflect high research and development intensity such as aerospace, computers, scientific instruments, and electrical machinery. Given the high level of research capability, the high-technology export proportion has a significant impact on the CEE long-term economic growth. The main positive externalities are derived from knowledge spillovers and economies of scale (Sheridan, 2014). The local firms can learn the high

technological content of imports and incorporate them into exports to boost their long-term growth. The higher growth would make the CEE countries more ideal places for foreign investors. The higher high-technology export proportion would help boost foreign portfolio investment in the CEE countries.

Finally, the saving (*Saving*) variable is the gross domestic saving of the CEE countries. It is calculated as gross domestic product less final consumption expenditure (total consumption). Domestic saving should act as a complement rather than a substitute to capital inflows (Verdier, 2008). Capital flows such as portfolio investments should move to countries where they are scarce. Foreign portfolio investments are substitutes for domestic savings as they can help finance domestic investment. Moreover, portfolio investments can serve as a complement to domestic savings as countries with higher savings would experience higher foreign portfolio investments. The high saving may have positive or negative impact on foreign portfolio investment in the CEE countries.

### 3.3. Two-stage least squares estimation

There may be an endogeneity problem in the foreign portfolio investment, trade and FDI variables. The higher trade and FDI flows would facilitate foreign portfolio investment in the CEE countries because these flows would make foreign investors more familiar with the CEE investment environment. However, the higher foreign portfolio investment inflow would deepen the CEE ties with portfolio investors which would boost their bilateral trade and FDI flows. To address this concern, this study uses the two-stage least squares (2SLS) method to re-estimate the endogenous variables (*Trade* and *FDI*). The instrumental variable (IV) would replace these variables. First, the IVs for *Trade* include *Inflat* and *Educat*. *Inflat* is the inflation rate variable which is measured by the consumer price index. It reflects the annual percentage change in the cost of living of average consumers. The higher inflation rate would increase the total production costs for the CEE countries. Hence, it would decrease exports but increase the demand for imports. *Educat* is the labor force education variable. It refers to the proportion of the labor force that has a secondary school education as a percentage of the total labor force. More educated labor force would improve country capability to produce both low- and high-technology export goods. It would have positive impact on exports but decrease the demand for imports. Second, the IVs for *FDI* include *CapForm* and *IntPay*. *CapForm* is the gross capital formation as a percentage of CEE GDP. It measures the CEE manufacturing industry competitiveness that can help predict their future output potential. The strong manufacturing competitiveness would help attract more FDI inflows because higher production capabilities would improve production efficiencies of foreign companies in the CEE countries. This in turn would boost more FDI in these countries. *IntPay* is the interest payments on government debt including long-term bonds, loans, and other debt instruments to domestic and foreign residents. The higher interest payments would indicate that countries have huge debt burden. This would slow their overall economic growth and deter FDI inflows. To test for the robustness of the results, the tax (*Tax*) variable is also used as IV for *FDI*. *Tax* refers to the taxes on income, profits, and capital gains that are levied on the actual or presumptive net income of individuals, corporate profits, and capital gains on assets. This variable measures the taxes collected

as a share of total CEE taxes. The amount of taxes represents tax burden on foreign investors. The higher tax would result in lower corporate profits for foreign investors, thereby discouraging FDI in the CEE countries. Finally, the endogeneity problem may also exist in the *GDPPC* variable. While more foreign portfolio investment inflows would accelerate economic development, the CEE countries with higher economic development would attract more foreign portfolio investment inflows. The IV for *GDPPC* is the lagged *GDPPC* of the CEE countries. Since it may take at least a year before the current *GDPPC* would have impact on foreign portfolio investment, the *GDPPC* is lagged by a year to measure this impact.

### 3.4. Data sources

The data on foreign portfolio investment are taken from the International Monetary Fund (IMF)'s Coordinated Portfolio Investment Survey. The government debt data are drawn from the IMF's Historical Public Debt Database. The missing data in 2016 and 2017 are obtained from the Trading Economics Database. The financial freedom data are found in the 2019 Index of Economic Freedom compiled by Heritage Foundation. The data for the explanatory variables and the IVs are all drawn from the IMF's World Development Indicators. The missing data on market capitalization are obtained from CEIC's Global Databases.

## 4. Empirical results

### 4.1. Financial development effects on foreign portfolio investment

This study identifies the main determinants of foreign portfolio investments in the CEE countries during 2001-2017. It examines whether the CEE financial market integration and trade flows can explain the portfolio investments since EU accession. To better estimate the integration effects, this study conducts three subperiod estimations. The estimation results for the subperiod 2001-2004 would suggest whether the CEE financial market reforms since the late 1990s have affected the foreign portfolio investments. The results for the subperiod 2005-2009 would indicate whether EU accession has helped the CEE countries to attract more foreign portfolio investments. Finally, the results for the subperiod 2010-2017 would reveal whether the financial crisis of 2008 and eurozone debt crisis of 2010 have adversely affected the foreign portfolio investments since 2010.

To test for the robustness of the results, equations (1) and (2) include *BankCred* and *DomCred* as the bank development variables respectively to see if the results remain the same. As shown in Tables 1 and 3, the results for equation (1) include *BankCred* as the bank development variable. Table 1 uses *IntPay* as IV, whereas Table 3 uses *Tax* as IV. As presented in Tables 2 and 4, the results for equation (2) include *DomCred* as the bank development variable. Table 2 uses *IntPay* as IV, whereas Table 4 uses *Tax* as IV. The results in all four tables for the foreign portfolio equity and debt flows are shown in columns (1) to (3) and columns (4) to (6), respectively. The overall results suggest that the stock market development has boosted the foreign portfolio equity flows to the CEE countries during the entire period. As presented in columns (1) to (3) of Tables 1 and 2,

the coefficients on *MktCap* are positive and statistically significant in all subperiods (2001-2004, 2005-2009, and 2010-2017). In fact, the positive stock market development effect has further increased since EU accession. As shown in columns (2) and (3) of Tables 3 and 4, the magnitude of the coefficient has increased from 0.730 in 2005-2009 to 1.034 in 2010-2017. This suggests that the positive stock market effect on the portfolio equity flows has appeared since the EU period 2005-2009 and persisted throughout the financial crisis and recovery periods 2010-2017.

The stock market development has only boosted the foreign portfolio debt flows during the EU period. As seen in column (5) of Tables 1 to 4, the coefficients on *MktCap* only become positive and statistically significant in 2005-2009. There is very mixed evidence of the stock market effect during the crisis and recovery periods. The negative coefficients in column (6) of Tables 1 and 2 only remain marginally significant over 2010-2017, whereas the coefficients in Tables 3 and 4 are not statistically significant at all. The overall results indicate that the CEE stock market development has facilitated the foreign portfolio equity flows during 2005-2017. But it only has the same effect on the foreign portfolio debt flows right after EU accession 2005-2009. This confirms the impact of EU financial integration on the foreign portfolio equity flows to the CEE countries. The EMU which eliminated the exchange rate risk has eased the access of eurozone investors to the entire eurozone markets. The eurozone investors have reallocated more portfolio investments to the other eurozone countries (De Santis and Gerard, 2009). The results also support the prediction of neoclassical theory that developing countries with financially open economies would receive higher capital inflows (Reinhardt et al., 2013). As the EMU has deepened the CEE stock market integration with western EU countries, the more developed CEE stock markets as reflected by their larger size have stabilized the foreign portfolio investment inflows (Broto et al., 2011). The CEE countries with larger stock market sizes have boosted both of the foreign portfolio equity and debt inflows during the EU period.

Finally, it is noteworthy that the stock market development has stronger positive effect on the foreign portfolio equity flows than debt flows. The stock market development has briefly boosted the portfolio debt flows during 2005-2009. But it has strong effect on the portfolio equity flows during 2005-2017. This can be explained by the strong convergence of eurozone equity markets due to the EMU creation. The euro adoption has contributed to the integration in portfolio equity markets (Giofre, 2012). This can explain why the larger stock markets have a longer positive effect on the foreign portfolio equity flows than debt flows during the study period.

In contrast to the stock market development, the CEE banking sector development has very weak effect on the foreign portfolio investment in the CEE countries. The higher bank development has only increased the foreign portfolio equity flows during the EU period. As seen in column (2) of Tables 1 to 4, the coefficients on *BankCred* and *DomCred* are only statistically significant over 2005-2009. This result is highly expected because of the banking sector reforms implemented by the CEE countries since the late 1990s. Besides, the EMU has led to more foreign bank entry into the CEE countries. The bank deregulation has promoted bank competition which has resulted in lower transaction

costs and greater variety of financial instruments. This in turn has increased cross-border capital flows including portfolio investment flows (Araujo et al., 2015). Moreover, their shift toward market-based banking systems has attracted more foreign portfolio equity flows because these reforms have contributed to the larger and efficient CEE banking sectors (Schmitz, 2011). Second, the lack of the bank development effect on the foreign portfolio equity flows during 2010-2017 can be attributed to the outbreak of the financial crisis in 2008 and eurozone debt crisis in 2010. The risk-averse foreign investors from western EU countries rebalanced their portfolio investments toward non-EU countries because of the low correlation in their financial markets (Vermeulen, 2013). This explains the lack of bank development on the foreign portfolio equity flows during 2010-2017. Finally, the bank development has no impact on the foreign portfolio debt flows during the entire study period. The reason is that more efficient CEE banking sectors have facilitated high transactions of financial assets among the local residents. This has substantially reduced their need for external finance. As a result, foreign capitals have played a less crucial role in providing major financing to these countries (Lane and Milesi-Ferretti, 2008). This may account for the lack of bank development effect on the foreign portfolio debt flows to the CEE countries.

Another related issue is whether financial freedom has any impact on foreign portfolio investments. As noted in Tables 1 to 4, the financial freedom in the CEE countries has promoted the foreign portfolio debt flows during the entire period 2001-2017. In contrast, it has no effect on the foreign portfolio equity flows. To a certain extent, the overall results are consistent with the prediction of neoclassical theory that among financially open economies, developing countries would experience net capital inflows, whereas developed countries would experience net capital outflows (Reinhardt et al., 2013). Both EU and EMU accession that eliminated exchange rate risk have facilitated the financial liberalization among the CEE countries since the 2000s. The CEE financial market openness has boosted the foreign portfolio debt inflows for the entire study period.

#### 4.2. Other explanatory variables affecting foreign portfolio investment

Another important concern of this study is whether trade flows would increase the foreign portfolio investment in the CEE countries. The high trade flows only have the expected positive effect on the foreign portfolio equity flows during the crisis and recovery periods. As shown in column (3) of Tables 3 and 4, the coefficients on *Trade* are only statistically significant during 2010-2017. In comparison, the trade flows have no effect on the foreign portfolio debt flow at all. As seen in Tables 1 and 2, the coefficients on *Trade* are not statistically significant for the entire period. The overall results suggest that the CEE countries have further expanded trade flows with their trading partners including non-EU countries during the crisis and recovery periods. Since trade transactions have increased trading partners' information about the CEE investment environment, high trade flows have made foreign investors more willing to make portfolio investments in these countries (Lane and Milesi-Ferretti, 2008; De Santis and Gerard, 2009). This confirms that trade flows in goods have reinforced financial asset flows (Aviat and Coeurdacier, 2007). This explains why the high trade flows have boosted the foreign portfolio equity flows to the CEE countries during 2010-2017.

Foreign direct investment has a positive effect on the foreign portfolio equity flows but has no impact on the foreign portfolio debt flows. As presented in column (3) of Tables 1 and 2, the coefficients on *FDI* are only statistically significant over 2010-2017. The result indicates that the higher foreign direct investment inflows have only boosted the foreign portfolio equity inflows during the crisis and recovery periods 2010-2017. This is contrary to the argument that foreign direct investment would be positively related to foreign portfolio investment. Foreign direct investments are long-term investment commitment. They are considered as a good proxy for information costs (Guerin, 2006). After foreign investors obtain valuable information about the CEE countries through FDI activities, they would experience lower information cost in making portfolio investments in these countries. However, the results of this study do not support this argument. This may be due to the fact that more non-EU countries have increased their shares of total FDI in the CEE countries. While the major western EU countries such as the Netherlands, Germany, France and Luxembourg have accounted for half of the total FDI, countries from other parts of Europe and the rest of the world have dominated the rest of the FDI (Szabo, 2019). In particular, the United States, Japan, South Korea, and China have further increased their FDI in the CEE countries. Unlike western EU countries, these countries may consider non-FDI factors to make foreign portfolio investment in the CEE countries. This may explain the lack of FDI effect on the foreign portfolio investment in these countries.

The high-technology export proportions have very mixed effect on the foreign portfolio equity and debt flows. The export proportions have the expected positive impact on the foreign portfolio equity flows during 2001-2009. As noted in columns (1) and (2) of Tables 1 and 2, the coefficients on *HiTech* are positive and statistically significant in 2001-2004 and 2005-2009. But the export proportions have the opposite effect on the foreign portfolio debt flows during 2005-2017. As seen in columns (5) and (6) of Tables 3 and 4, the coefficients become negative and statistically significant in 2005-2009 and 2010-2017. It suggests that the export proportions have discouraged the foreign portfolio debts flows since EU accession in 2004. The level of innovation capabilities is considered as one of the crucial determinants for facilitating high and sustainable economic growth (Lloyd-Ellis and Roberts, 2002). The advanced research and innovation capabilities as reflected by high-technology export proportions would make the CEE countries more favorable places for foreign portfolio investments. But the results of this study only confirm this argument for the foreign portfolio equity flows.

Contrary to the expectation, the government debt has a positive effect on the foreign portfolio debt flows. As presented in columns (4) to (6) of Tables 1 to 4, the coefficients on *GovDebt* are positive and statistically significant for the entire period 2001-2017. As seen in column (3) of Tables 1 and 2, the same effects are only found in the foreign portfolio equity flows during the crisis and recovery periods 2010-2017. The overall results are not consistent with the argument that countries with strong macroeconomic fundamentals would receive more foreign portfolio investment as they can better insulate their financial markets from financial crisis (Fratzscher, 2012). Countries with worsening public finance would face huge capital outflows during crisis (Milesi-Ferretti and Tille, 2011). The possible explanation for this surprising result is that the CEE countries have relied

on foreign capitals to sustain their economic growth for the past two decades. Therefore, they have run much larger debts to achieve rapid convergence with western EU countries in output and living standards (Schmitz, 2011). This can explain why the larger amount of government debts has boosted the foreign portfolio debt flows to the CEE countries.

##### 5. Implications for the long-term policies to boost foreign portfolio investment inflows

The results provide very important implications for attracting more foreign portfolio investments. First, the results indicate that the CEE banking sector development has only played a minor role in boosting the foreign portfolio investment. To strengthen the bank effect, the CEE countries should continue their banking sector reforms which have started since EU accession. The quality of their legal institutions should be improved to create more favorable environment for foreign banks. In particular, the protection of property rights needs to be strictly enforced to facilitate cross-border bank flows (Papaioannou, 2009). As foreign investors are protected against expropriation and contract repudiation, they would make larger bank investments in the CEE countries. Besides, the improvement in their institutional quality through lower sovereign risks can help them to better insulate from financial crisis (Fratzscher, 2012). The well-developed banking sectors would improve investment environment for foreign portfolio investors. Besides the banking sector reforms, the CEE countries should pursue much deeper bank integration with western EU countries. The developed EU countries have made huge investments in the CEE banking sectors since the late 1990s. The high foreign bank presence during the 2000s contributed to the higher CEE economic growth (Schnabela and Seckinger, 2019). The eurozone debt crisis of 2010 highlighted the importance of replacing national bank supervision institutions by supranational institutions. The closer EU-wide bank supervision in each EU member state can protect against financial crisis caused by serious bankruptcy in member states (Sapir, 2011). The more integrated bank supervisory regime would allow western EU banks to allocate bank capitals more efficiently in the CEE countries. This can help them to attract more foreign portfolio investments from western EU countries.

Second, the results suggest that the CEE stock market development has strong impact on facilitating the foreign portfolio investment in the CEE countries. The higher stock market development has accelerated the portfolio equity market integration among the eurozone countries. The euro adoption triggered by the EMU formation has reduced market imperfections such as high transaction costs (Haselmann and Herwartz, 2010). The EMU has created a single market in financial services and integrated money and credit markets. More importantly, the high depth and liquidity of a single eurozone financial market have boosted capital flows with non-member countries (Lane and Milesi-Ferretti, 2008). To attract more foreign portfolio investment in the long run, the CEE countries should deepen the stock market integration with western eurozone countries. As the CEE stock markets would receive more capital flows from developed eurozone countries, their stock market size would further expand. They can have better access to more external financing including foreign portfolio investment. To achieve the deeper stock market integration, the CEE countries should continue stock market reforms

to establish proper institutional and corporate governance framework. Better market regulatory and supervisory mechanisms would boost their appeal to foreign investors. In particular, they should improve the legislation for shareholders' protection which can alleviate information problems especially monitoring costs. This would substantially reduce information constraints that can hinder portfolio diversification in eurozone countries (Giofre, 2017). The well-developed CEE stock markets can help boost foreign portfolio investments from both eurozone and non-eurozone countries.

Finally, the CEE countries should further control global capital inflows to better insulate themselves from financial crisis. The economic policy uncertainty in Germany, France, and Italy would lead to volatile environment which can facilitate risk spillovers among the eurozone financial markets. In fact, the risk spillovers triggered by the 2008 financial crisis occurred among the eurozone and United States financial markets (Apergisad et al., 2019). To avoid similar crisis in future, they should mitigate economic uncertainty to reduce the risk of destabilization of eurozone financial market performance (Bernal et al., 2016). Foreign investors that are less familiar with the eurozone countries are more likely than domestic investors to exit the eurozone financial markets during crisis period (Galstyan and Lane, 2013). The financial market integration has made the CEE economies very vulnerable to external shocks in western EU countries. In the long run, the CEE countries should establish institutions to monitor foreign capital inflows especially from their major allies. They should further control the debt level due to huge capital inflows from the eurozone countries. More stringent legislations should be made to maintain stable level of foreign capital inflows including portfolio investments. They should impose capital control which can reduce the risk associated with sudden reversal of capital inflows (Cardarelli et al., 2010). Furthermore, the CEE financial institutions should closely monitor the allocation of foreign portfolio investments to productive investments. This can reduce the risk of massive foreign capital withdrawal in case of financial crisis outbreak. As the CEE countries adopt appropriate capital control policy, the stable foreign portfolio investment inflow can contribute to their long-term economic growth.

## 6. Conclusion

This study identifies the main determinants of foreign portfolio investments in the CEE countries during 2001-2017. It focuses on whether the CEE financial market integration and trade flows can explain the foreign portfolio investments since EU accession. First, the results suggest that the stock market development has facilitated the foreign portfolio equity flows during the EU and crisis periods. But it only has positive effect on the foreign portfolio debt flows during the EU period. The overall results confirm the positive EMU effect on the CEE stock market integration with western EU countries. The larger CEE stock markets have attracted more foreign portfolio investments. In contrast to the stock market development, the banking sector development has very weak effect on the foreign portfolio investment. The higher bank development only has increased the foreign portfolio equity flows during the EU period. There is no bank development effect on the foreign portfolio debt flows during the entire period. The CEE bank reforms which have emphasized the market-based banking systems have created the larger and deeper banking

sectors. Besides, EMU accession has led to more foreign bank entry into the CEE countries. This has resulted in the higher bank competition in these countries. All these have facilitated the higher foreign portfolio equity inflows. Moreover, the reason for the lack of bank development impact on the foreign portfolio debt flows is that the higher CEE bank development has reduced their need for external finance. More developed banking sectors have facilitated high transactions of financial assets among the local residents.

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**Table 1.** 2SLS Estimation of the determinants of foreign portfolio investments in the CEE countries

	Equity	Equity	Equity	Debt	Debt	Debt
	(1)	(2)	(3)	(4)	(5)	(6)
	2001-2004	2005-2009	2010-2017	2001-2004	2005-2009	2010-2017
<i>BankCred</i>	-0.065	2.122***	0.208	0.041	0.705	0.148
	(-0.263)	(2.435)	(0.582)	(0.218)	(1.129)	(0.701)
<i>MktCap</i>	0.557*	0.946***	0.807***	0.029	0.452***	-0.238*
	(1.933)	(4.125)	(3.788)	(0.129)	(2.753)	(-1.889)
<i>Trade</i>	2.253	-0.340	1.517	0.229	-0.361	-0.219
	(0.778)	(-0.183)	(1.348)	(0.102)	(-0.273)	(-0.330)
<i>FDI</i>	-0.796	-0.439	0.474**	0.969	-0.328	-0.150
	(-0.550)	(-1.336)	(2.010)	(0.863)	(-1.396)	(-1.074)
<i>Manuf</i>	-3.932**	-1.324	-1.385*	-2.756**	-0.288	0.286
	(-2.331)	(-0.913)	(-1.896)	(-2.106)	(-0.277)	(0.662)
<i>GDPPC</i>	-0.007	-0.012	0.132	0.620	-0.345	-0.064
	(-0.011)	(-0.013)	(0.293)	(1.403)	(-0.528)	(-0.236)
<i>NFA</i>	-0.108	0.261	-0.332***	-0.476*	-0.104	-0.084
	(-0.318)	(1.277)	(-3.061)	(-1.810)	(-0.713)	(-1.310)
<i>GovDebt</i>	0.091	-0.150	0.398**	0.970**	0.519*	1.512***
	(0.172)	(-0.360)	(2.154)	(2.377)	(1.748)	(13.801)
<i>HiTech</i>	0.530*	1.006***	0.013	0.139	0.082	-0.271
	(1.676)	(2.245)	(0.041)	(0.569)	(0.256)	(-1.420)
<i>PopSize</i>	1.825***	1.754***	1.067***	1.196**	0.910***	0.664***
	(2.625)	(4.450)	(5.255)	(2.217)	(3.229)	(5.518)
<i>FinFree</i>	0.666	1.527	-0.628	0.758	1.575**	2.308***
	(0.832)	(1.295)	(-0.868)	(1.221)	(1.869)	(5.376)
<i>Saving</i>	3.480***	0.500	1.672**	1.630**	1.235*	1.737***
	(3.690)	(0.492)	(2.288)	(2.229)	(1.702)	(4.008)
Adjusted $R^2$	0.756	0.650	0.625	0.674	0.772	0.864
Observations	52	65	104	52	65	104

**Notes:** 2SLS refers to the two-stage least squares estimation.

All variables are in logarithm. T-statistics are reported in parentheses.

\*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10%.

**Table 2.** 2SLS estimation of the determinants of foreign portfolio investments in the CEE countries

	Equity	Equity	Equity	Debt	Debt	Debt
	(1)	(2)	(3)	(4)	(5)	(6)
	2001-2004	2005-2009	2010-2017	2001-2004	2005-2009	2010-2017
<i>DomCred</i>	-0.065	2.122***	0.208	0.040	0.705	0.148
	(-0.266)	(2.429)	(0.582)	(0.210)	(1.131)	(0.701)
<i>MktCap</i>	0.557*	0.947***	0.807***	0.029	0.452***	-0.238*
	(1.936)	(4.120)	(3.788)	(0.132)	(2.753)	(-1.889)
<i>Trade</i>	2.245	-0.349	1.517	0.217	-0.363	-0.220
	(0.776)	(-0.183)	(1.349)	(0.097)	(-0.274)	(-0.330)
<i>FDI</i>	-0.793	-0.440	0.473**	0.965	-0.328	-0.150
	(-0.549)	(-1.337)	(2.010)	(0.863)	(-1.397)	(-1.074)
<i>Manuf</i>	-3.928**	-1.324	-1.385*	-2.754**	-0.285	0.287
	(-2.331)	(-0.910)	(-1.896)	(-2.110)	(-0.274)	(0.661)
<i>GDPPC</i>	-0.006	-0.013	0.133	0.620	-0.345	-0.063
	(-0.011)	(-0.014)	(0.293)	(1.405)	(-0.529)	(-0.237)
<i>NFA</i>	-0.107	0.261	-0.332***	-0.474*	-0.104	-0.084
	(-0.318)	(1.277)	(-3.061)	(-1.811)	(-0.713)	(-1.309)
<i>GovDebt</i>	0.092	-0.150	0.398**	0.971**	0.520*	1.513***
	(0.175)	(-0.360)	(2.154)	(2.385)	(1.748)	(13.800)
<i>HiTech</i>	0.530*	1.008***	0.013	0.141	0.082	-0.271
	(1.679)	(2.247)	(0.041)	(0.575)	(0.257)	(-1.420)
<i>PopSize</i>	1.824***	1.752***	1.067***	1.192**	0.910***	0.664***
	(2.627)	(4.446)	(5.255)	(2.217)	(3.229)	(5.518)
<i>FinFree</i>	0.669	1.528	-0.628	0.762	1.576*	2.308***
	(0.836)	(1.293)	(-0.868)	(1.230)	(1.868)	(5.376)
<i>Saving</i>	3.480***	0.500	1.672**	1.628**	1.234*	1.737***
	(3.697)	(0.492)	(2.288)	(2.229)	(1.700)	(4.008)
Adjusted $R^2$	0.756	0.650	0.625	0.674	0.772	0.864
Observations	52	65	104	52	65	104

**Notes:** 2SLS refers to the two-stage least squares estimation.

All variables are in logarithm. T-statistics are reported in parentheses.

\*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10%.

**Table 3.** 2SLS estimation of the determinants of foreign portfolio investments in the CEE countries

	Equity	Equity	Equity	Debt	Debt	Debt
	(1)	(2)	(3)	(4)	(5)	(6)
	2001-2004	2005-2009	2010-2017	2001-2004	2005-2009	2010-2017
<i>BankCred</i>	-0.078	1.654*	0.407	0.038	0.602	0.324
	(-0.303)	(1.917)	(0.840)	(0.249)	(1.088)	(1.098)
<i>MktCap</i>	0.537*	0.729***	1.034***	0.095	0.331**	-0.054
	(1.919)	(3.179)	(3.878)	(0.553)	(2.250)	(-0.327)
<i>Trade</i>	2.737	2.621	2.946***	-0.999	1.425	0.851
	(1.118)	(1.253)	(3.229)	(-0.668)	(1.065)	(1.513)
<i>FDI</i>	-0.961	0.119	0.389	0.556	-0.020	-0.227
	(-0.974)	(0.353)	(1.346)	(0.920)	(-0.095)	(-1.274)
<i>Manuf</i>	-4.225**	-1.357	-1.167	-2.335**	-0.657	0.436
	(-2.348)	(-0.837)	(-1.536)	(-2.111)	(-0.633)	(0.934)
<i>GDPPC</i>	-0.110	-0.341	0.533	0.615	-0.004	0.281
	(-0.177)	(0.251)	(0.778)	(1.633)	(-0.009)	(0.667)
<i>NFA</i>	-0.102	-0.150	-0.439***	-0.369***	-0.310***	-0.168***
	(-0.413)	(-0.806)	(-3.821)	(-2.440)	(-2.595)	(-2.376)
<i>GovDebt</i>	-0.013	-0.197	0.271	1.170***	0.662**	1.417***
	(-0.023)	(-0.567)	(1.500)	(3.714)	(1.925)	(12.735)
<i>HiTech</i>	0.538***	-0.025	-0.187	0.251**	-0.399*	-0.409**
	(2.770)	(-0.068)	(-0.562)	(2.107)	(-1.733)	(-1.999)
<i>PopSize</i>	1.915***	2.005***	1.272***	0.871***	1.165***	0.820***
	(4.287)	(3.925)	(6.745)	(3.186)	(3.566)	(7.061)
<i>FinFree</i>	0.617	0.885	-1.235**	0.944**	0.870	1.845***
	(0.803)	(0.587)	(-1.747)	(2.006)	(0.902)	(4.241)
<i>Saving</i>	3.402***	1.418	1.238	1.645***	1.991***	1.388***
	(3.407)	(1.001)	(1.557)	(2.690)	(2.416)	(2.835)
Adjusted $R^2$	0.732	0.662	0.594	0.776	0.823	0.841
Observations	52	65	104	52	65	104

**Notes:** 2SLS refers to the two-stage least squares estimation.

All variables are in logarithm. T-statistics are reported in parentheses.

\*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10%.

**Table 4.** 2SLS estimation of the determinants of foreign portfolio investments in the CEE countries

	Equity	Equity	Equity	Debt	Debt	Debt
	(1)	(2)	(3)	(4)	(5)	(6)
	2001-2004	2005-2009	2010-2017	2001-2004	2005-2009	2010-2017
<i>DomCred</i>	-0.078 (-0.306)	1.644* (1.914)	0.407 (0.847)	0.037 (0.233)	0.599 (1.085)	0.324 (1.097)
<i>MktCap</i>	0.537* (1.927)	0.730*** (3.179)	1.034*** (3.870)	0.095 (0.553)	0.331** (2.260)	-0.054 (-0.327)
<i>Trade</i>	2.736 (1.117)	2.603 (1.253)	2.946*** (3.224)	-1.004 (-0.668)	1.479 (1.061)	0.850 (1.512)
<i>FDI</i>	-0.957 (-0.970)	0.117 (0.354)	0.389 (1.347)	0.559 (0.923)	-0.021 (-0.099)	-0.227 (-1.273)
<i>Manuf</i>	-4.221*** (-2.340)	-1.356 (-0.837)	-1.266 (-1.536)	-2.333** (-2.106)	-0.655 (-0.631)	0.437 (0.934)
<i>GDPPC</i>	-0.109 (-0.177)	-0.354 (-0.251)	0.533 (0.778)	0.616 (1.632)	-0.008 (-0.009)	0.281 (0.666)
<i>NFA</i>	-0.102 (-0.414)	-0.150 (-0.806)	-0.439*** (-3.821)	-0.368*** (-2.435)	-0.310*** (-2.595)	-0.168*** (-2.376)
<i>GovDebt</i>	-0.012 (-0.023)	-0.202 (-0.367)	0.271 (1.500)	1.171*** (3.708)	0.662** (1.923)	1.418*** (12.739)
<i>HiTech</i>	0.538*** (2.771)	-0.022 (-0.068)	-0.187 (-0.562)	0.250** (2.099)	-0.398* (-1.731)	-0.409** (-1.999)
<i>PopSize</i>	1.914*** (4.288)	2.005*** (3.925)	1.272*** (6.745)	0.871*** (3.176)	1.163*** (3.570)	0.820*** (7.062)
<i>FinFree</i>	0.619 (0.805)	0.893 (0.587)	-1.235* (-1.747)	0.947** (2.006)	0.874 (0.907)	1.845*** (4.241)
<i>Saving</i>	3.403*** (3.414)	1.412 (1.160)	1.238 (1.557)	1.644*** (2.686)	1.988*** (2.414)	1.388*** (2.835)
Adjusted $R^2$	0.733	0.662	0.594	0.775	0.824	0.841
Observations	52	65	104	52	65	104

**Notes:** 2SLS refers to the two-stage least squares estimation.

All variables are in logarithm. T-statistics are reported in parentheses.

\*\*\*, \*\*, \* indicate significance at 1%, 5%, and 10%.