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Why Do Low Interest Rates Not Fuel Credit Growth in the New Member States of the EU?¹

Andreas Hoffmann²

Abstract

Since 2009, low interest rates have been associated with rapid increases in credit growth and overheating pressure in many emerging markets. In the new member states (NMS) of the European Union (EU), however, domestic lending contracted. The paper provides empirical evidence that domestic lending hinges more on cross-border financing if a country is a member of the EU. The decline in cross-border bank financing since 2009 helps explain the credit contraction in the NMS. My finding lends support to studies suggesting that political integration may have collateral effects on emerging markets via financial integration.

JEL: E51, F34, F65.

Keywords: Emerging Europe, credit growth, cross-border lending, political integration.

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1. INTRODUCTION

The collapse of Lehman Brothers in 2008 and the following global financial crisis depressed markets around the world. To stabilize financial markets and fight the so-called Great Recession, the world's major central banks opted to cut interest rates toward zero and implement unconventional policies such as large-scale bond-buying programs in 2009. Central banks in most emerging markets followed the monetary policy of the advanced economies.

Since 2009, investments and growth have picked up again in most of the emerging markets. A corresponding rise in credit growth and inflation has become a major concern for policymakers in the emerging and developing countries of Latin America and East Asia (e.g. Borio et al. 2011, Filardo and Yetman 2012, Reinhart 2013). In the new member states of the European Union (NMS)³, however, domestic credit to the private sector shrank from 2008 to 2012.

This paper suggests that *political integration* with the EU increased the importance of external financing for domestic credit growth in the NMS relative to other emerging market countries. Building on Lane and McQuade's (2014) empirical model, I provide empirical evidence that domestic lending is more responsive to changes in cross-border bank lending if a country is a member of the EU. Given the stark decline in cross-border financing in the NMS since 2009, EU membership explains much of the recent contraction in domestic lending in these countries.

In the 2000s, EU accession provided hope for future institutional reform and macroeconomic convergence in the NMS. Indeed, previous research found that *political integration* with the EU did create financial benefits for Emerging Europe. For instance,

³ In this study, I refer to Bulgaria, Estonia, Czech Republic, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia and the Slovak Republic as NMS.

Hauner et al. (2007) and Luengnaruemitchai and Schadler (2007) showed that government bond yields dropped significantly when EU membership was decided in the NMS of the EU. More recently, Friedrich et al. (2013) provided evidence that in no other region than in Emerging Europe were current account deficits (which reflect international capital inflows) associated with substantial growth over a longer period (until 2008).

The paper is related to the growing literature on the link between international financial flows and domestic credit growth (e.g. Mendoza and Terrones 2012, Lane and Milesi-Ferretti 2011). Recent research has stressed that credit growth in the 2000s was mainly fuelled by cross-border bank inflows (Calderón and Kubota 2012, Borio and Disyatat 2011, Lane and McQuade 2014). This link between rises in external bank financing and domestic credit growth is not obvious. If banks finance domestic credit to the private sector mainly domestically, e.g., via deposits, changes in financial inflows may not result in credit growth. In contrast, if banks finance domestic credit mainly via loans or deposits from global banks, we will expect a closer dependence of domestic credit growth on cross-border financial inflows. I find that political integration can influence the dependence of domestic credit growth on external bank financing.

The paper suggests that until 2007-8, the adoption of EU rules and a financial supervisory system provided additional credibility, leading to increased financial integration, cross-border financing of banks, and enhanced domestic credit to the private sector in the NMS. However, since 2009 the problems of the euro area and its shaky financial system spilled over to the NMS via financial integration. My findings imply that collateral effects of EU integration very much depend on the time period we under consideration as well as on the expectations stemming from its economic and political institutions.

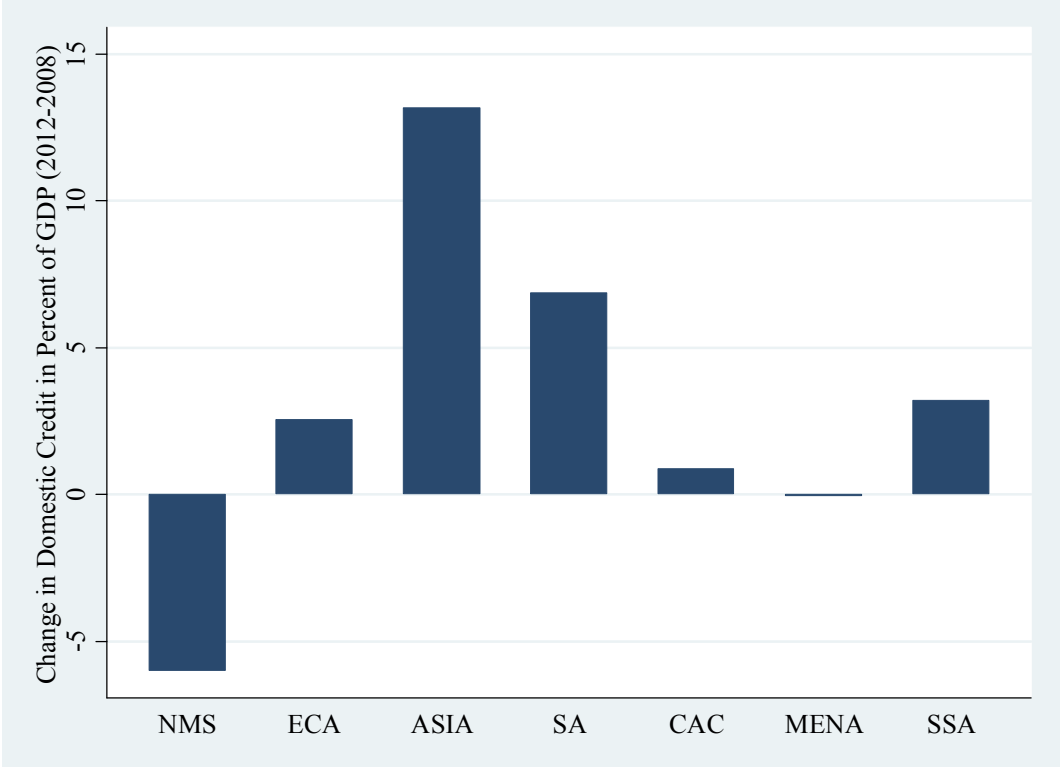
2. EU MEMBERSHIP AND THE LINK BETWEEN CROSS-BORDER FINANCIAL FLOWS AND DOMESTIC CREDIT GROWTH: GRAPHICAL ASSESSMENT

In order to analyze the strength of the link between cross-border bank flows and domestic credit growth, I evaluate data for 89 emerging and developing countries. The full country list is presented in Appendix A. Countries were selected based on the World Bank categories of “emerging market” and “developing country”, while domestic credit data come from the World Development Indicators (WDI).

I begin with a graphical assessment of the link between cross-border bank flows and credit growth. Figure 1 plots the rise in domestic credit to the private sector as a percentage of GDP for each region of emerging markets since 2008. “NMS” means New Member States of the EU.

Domestic credit to the private sector declined by more than 5 percent since 2008. In contrast, in Eastern Europe and Central Asia (ECA), Eastern and Southeastern Asia (ASIA), South America (SA), Central America and the Caribbeans (CAC) and Sub-Saharan Africa (SSA) domestic credit to the private sector as a percent of GDP grew several percentage points in the same period. The South American and the Eastern and Southeastern Asian countries stick out with particularly high rates of credit growth. Only in the Middle East and North Africa (MENA) we see no change in average credit growth.

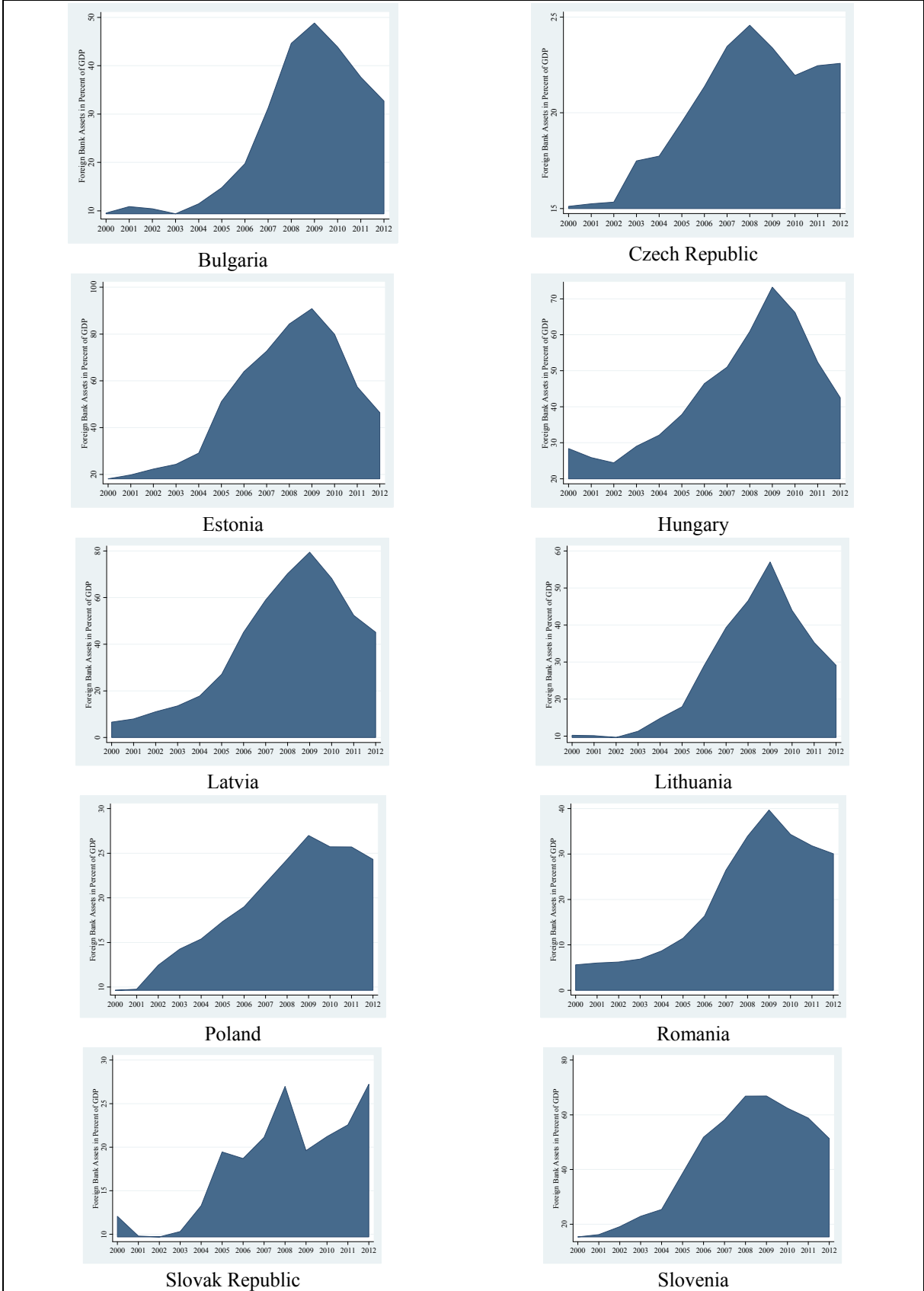
Figure 1: Credit Growth in Emerging and Developing Countries (2008 - 2012)



Data: WDI 2014. Own Calculation. See Appendix A for a description of the country groups.

Figure 2 plots the development of outstanding foreign claims of the NMS banking sector, as reported by the Bank of International Settlements (BIS) in its 2000–2012 Locational Banking Statistics (Table 6A). The figure shows that until 2008, foreign claims rose sharply in all NMS. The rise starts when the European Central Bank (ECB) lowered interest rates in response to the troubles in global asset markets following the bursting of the dot-com bubble. Even in Poland, which adopted a flexible exchange rate regime, foreign claims jumped from 10% of GDP in 2000 to 25% in 2008. Since 2009, in most NMS the amount of outstanding foreign claims as a percentage of GDP has fallen dramatically and not recovered. Only in the Slovak Republic was the initial drop in foreign bank claims offset after the introduction of the euro in 2009.

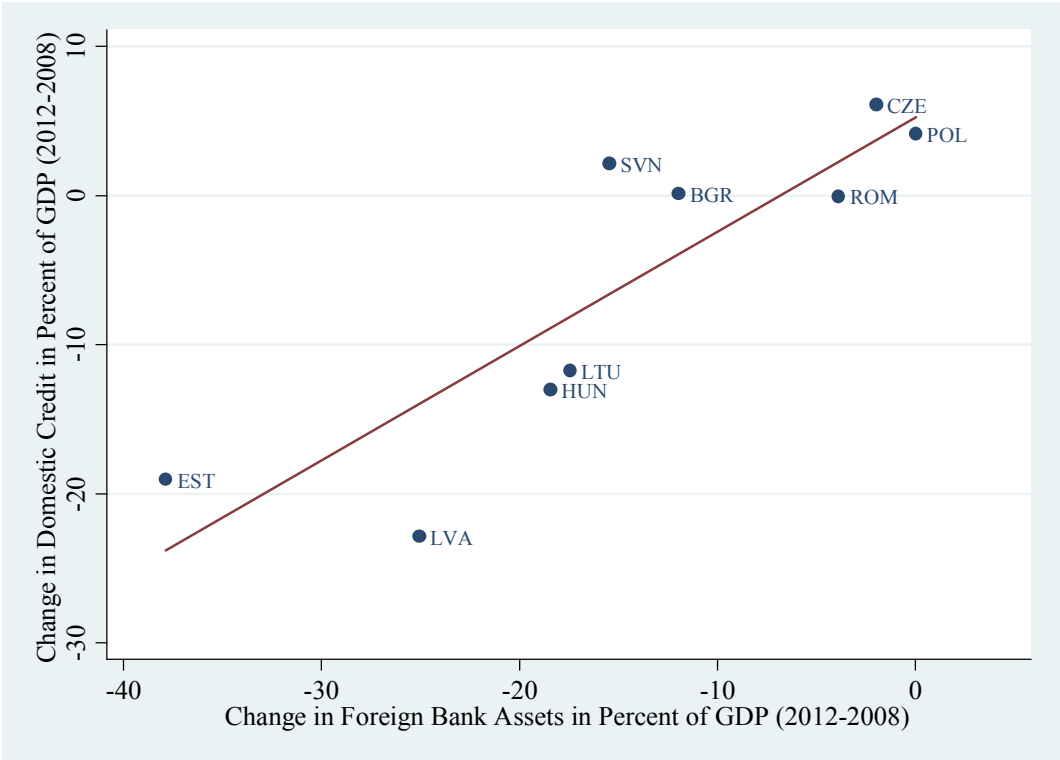
Figure 2: Development of Foreign-Bank Assets/GDP in the New Member States



Data: BIS, WDI, 2013.

Figure 3 illustrates the correlation of the change in foreign claims, i.e. financial flows, and changes in domestic credit for the NMS during this period. The slope of the line suggests that the two variables move together. A rise in cross-border financing accompanies a rise in domestic lending in the NMS, and vice versa. Due to missing data for 2012, the Slovak Republic is not described in Figure 3. Yet, since domestic credit rose there only slightly from 2008 to 2011, Slovakia would not be an outlier in the graph. The data point would be somewhere near that of Poland.

Figure 3: Credit Growth and Change in Foreign Bank Claims in NMS (2008–2012)

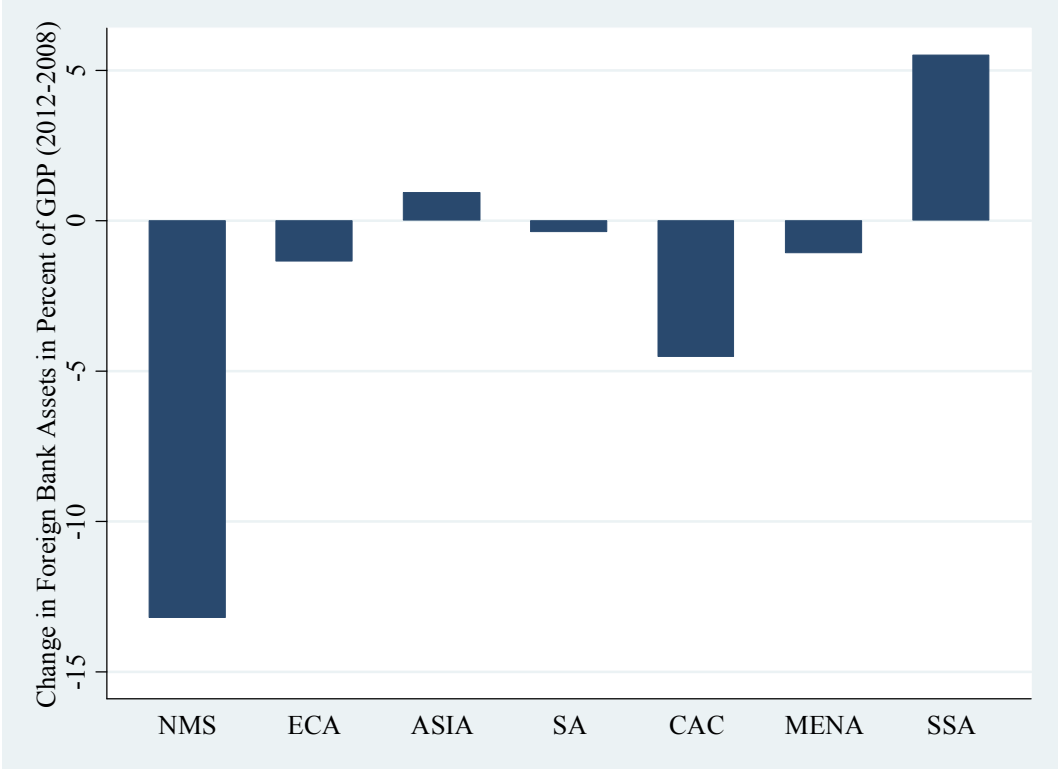


Data: BIS, Locational Statistics, WDI, 2013.

My central concern is, however, whether there is a difference between country groups in the post-2008 period of low interest rates that may explain observed differences between domestic lending in the NMS and in the other countries. Figure 4 illustrates the development of foreign claims for different country groups. It is notable that foreign claims of BIS-reporting banks fell drastically only in the NMS. The NMS is also the only country group

with a substantial decline in domestic credit. Actually, in some country groups, cross-border lending fell, while domestic lending increased.

Figure 4: Change in Foreign Bank Assets in Emerging Markets (2008–2012)



Data: BIS, Locational Statistics, WDI, 2013.

3. EMPIRICAL ANALYSIS

To test whether the link between cross-border financing and domestic credit growth is stronger in the NMS than in other emerging markets, I augment the empirical model used in Lane and McQuade (2014) and regress the change in domestic credit from 2008 to 2012 on a set of explanatory variables. The focus on medium-term effects in regressing multiyear non-overlapping changes on a set of explanatory variables instead of year-over-year changes will reduce the distortions provoked by short-run volatility. This approach is also common e.g. in the empirical literature on determinants of the current account balance (e.g. Chinn and Prasad

2003). My augmented cross-sectional model for the post-2008 period takes the following form:

$$\Delta DC_{i,2012-2008} = \alpha_0 + \alpha_1 DC_{i,2008} + \alpha_2 GDPpc_{i,2008} + \alpha_3 \Delta FF_{i,2012-2008} + \alpha_4 D_i + \alpha_5 (D_i * \Delta FF_{i,2012-2008}) + \alpha_6 \Delta DC_{i,2008-2003} + \varepsilon_i,$$

where $\Delta DC_{i,2012-2008}$ is the non-overlapping absolute change in domestic credit to the private sector scaled by GDP between 2012 and 2008 for every country i .

As independent variables I include the level of initial domestic credit (scaled by GDP) $DC_{i,2008}$ and the log of GDP per capita ($GDPpc_{i,2008}$) to capture the stage of financial and economic development. The idea behind this is that when the initial level of domestic credit is low, we can expect a catch-up in financial deepening that may explain credit growth. Similarly, countries with a lower level of GDP per capita are expected to catch up, which may lead to higher credit growth in the medium term.⁴

The variable $\Delta FF_{i,2012-2008}$ captures international financial inflows (in percentage of GDP) from 2008 to 2012. I focus on the use of the 2008–2012 change in outstanding foreign claims of BIS-reporting countries (in percent of GDP), i.e. cross-border bank flows. Additional cross-border financing of banks should increase domestic credit growth. I expect a positive coefficient.

To test whether political integration with the EU makes a difference, I construct a NMS-dummy D_i that takes the value 1 if a country is a member of the EU and the value zero otherwise. The coefficient on the NMS-dummy would result only in a different intercept. Because I aim to test whether a fall or rise in cross-border lending has a larger effect in the NMS than in other emerging markets, I add an interaction term of the NMS-dummy and

⁴ Exact variable definitions and data sources are presented in Appendix B.

financial flow variable to the regression ($D_i * \Delta FF_{i,2012-2008}$). This interaction term is my main variable of interest. A positive and significant coefficient on the interaction term signals that the fall in cross-border lending depresses domestic credit growth in EU member countries more than in non-EU members. Given the tremendous fall in cross-border lending in the post-2008 period, this link may be of some importance.

Finally, I include the absolute change in domestic credit between 2008 and 2003 ($\Delta DC_{i,2008-2003}$).⁵ According to the credit boom gone bust explanation, the severity of a credit contraction following financial crises depends on the size of the credit expansion during the boom (Eichengreen and Mitchener 2003), which may have emerged along with sectorial mal-investment and structural distortions in booming economies (Borio and Disyatat 2011). If there is already a debt overhang or substantial mal-investment, these may explain why there is no urge for credit expansion despite low interest rates, and vice versa: the debt overhang first needs to be coped with. Structural adjustments in overinvested industries are time-consuming. They typically result in unemployment and a period of depressed credit demand. For instance Reinhart and Reinhart (2010) show that “after the fall” countries often end up on a lower growth path and that demand for credit falls for some time following a period of increased leverage and credit expansion.

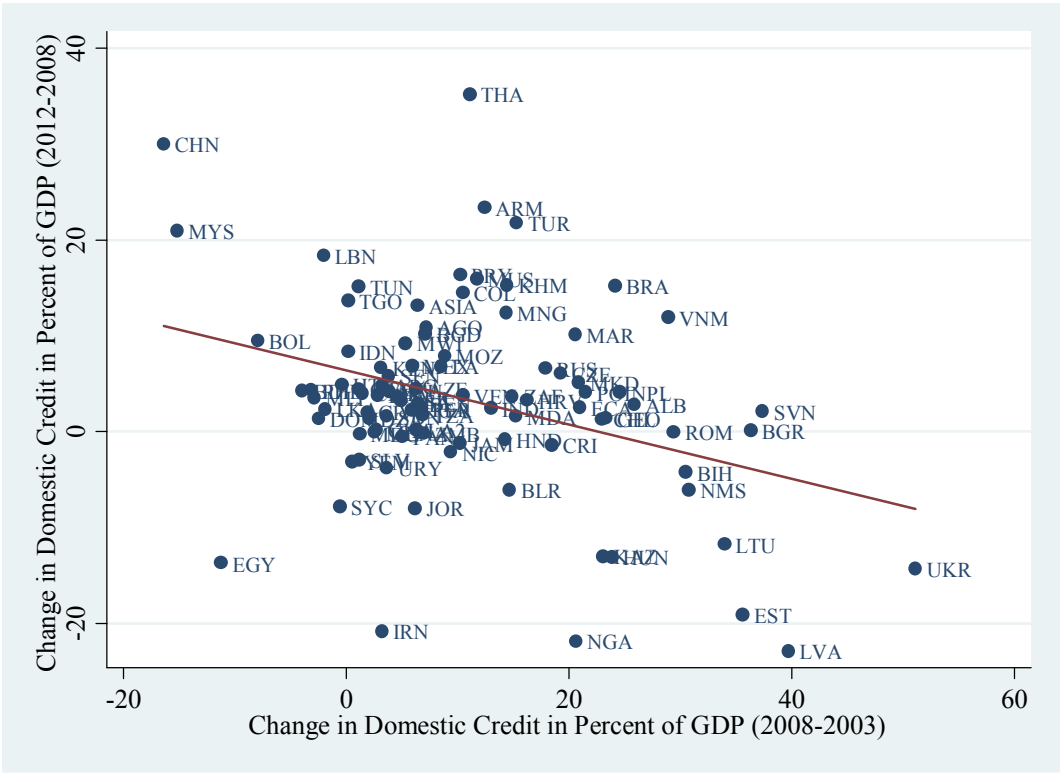
Brown and Lane (2011) provide a detailed analysis of whether there was a debt overhang in Emerging Europe that may inhibit further credit expansion. The study does not find evidence of a general debt overhang; only the Baltic countries and Slovenia (countries with fixed exchange rates) may have accumulated too much debt in the enterprise sector. They also found that within the EU area Latvia and Lithuania accumulated high shares of

⁵The pairwise correlation coefficient of the nonperforming loans ratio and my credit boom variable is 0.4 and highly significant. I use the credit boom index because nonperforming loan data is available for only 53 of the countries in my sample. The regression results are robust to the use of the nonperforming loan ratio. Coefficients on nonperforming loans are negative and significant at a 5% level, which confirms that a higher share of nonperforming loans is associated with lower credit growth.

nonperforming loans in the banking sector. Therefore, banks in these countries may not be in a good position to lend.

Lane and McQuade (2014) identify the years from 2003 to 2008 as the global credit boom period. Figure 5 illustrates that there is no obvious correlation of domestic credit growth during the credit boom of the 2000s and period of low interest rates for the full sample of countries.

Figure 5: Credit Expansion as Proxy for Credit Contraction: Full Sample

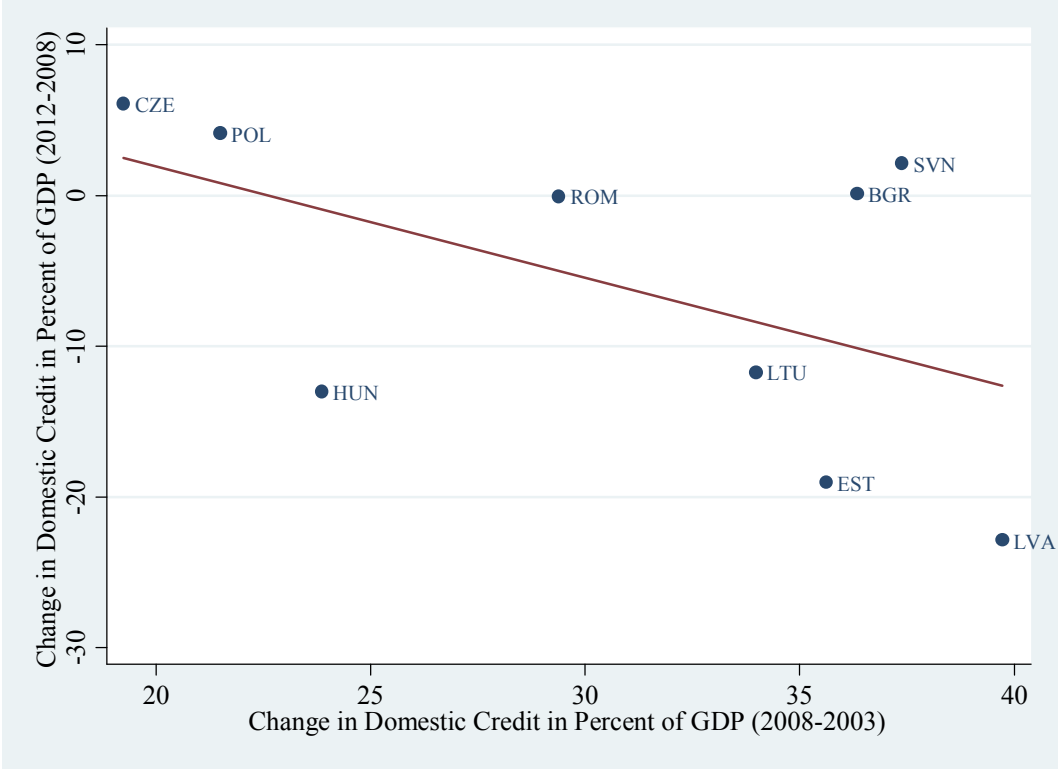


Data: WDI, 2013.

In contrast, Figure 6 describes the same phenomenon for the NMS and shows a negative correlation. The higher credit growth was in the boom period of the 2000s; the lower credit growth occurred thereafter. The NMS identified as having a debt overhang in the enterprise sector as well as those with the most nonperforming loans are among the countries with the highest rates of credit growth from 2003 to 2008. Thus, the lending boom of the

2000s, rather than a greater dependence on financial flows, may explain lower levels of credit growth in most NMS since 2009.

Figure 6: Credit Boom as Proxy for Credit Bust: NMS



Data: WDI, 2013.

Data on domestic credit to GDP in recent years is incomplete for the Slovak Republic, Libya, and the Kyrgyz Republic. Further, the WDI does not provide data on per capita GDP (at 2005 constant prices) for Argentina and Jamaica. Dropping these five countries leaves 84 observations for the cross-sectional analysis (See Appendix C for the descriptive statistics of the data).

Table 1 describes the estimation results of my model. Column 1 shows that the 2008 GDP per capita and credit-to-GDP ratios alone do not explain the variation in changes in credit to GDP between countries. Although the results indicate that countries with a higher initial GDP per capita experienced lower credit growth in this period, the regression does not explain much of the variation between countries. Column 2 indicates that after adding the

NMS-dummy to the equation the coefficients on initial credit and GDP per capita turn insignificant. Only the coefficient on the NMS-dummy is significant at commonly used levels. Being a member of the EU seems to correspond with lower domestic credit growth between 2008 and 2012.

Table 1: Regression Results⁶

	(1)	(2)	(3)	(4)	(5)
Initial Credit	0.0533 (0.064)	0.064 (0.061)	0.083 (0.060)	0.101* (0.061)	0.122** (0.059)
Initial GDP p.c.	-1.819* (1.045)	-0.478 (1.035)	-0.937 (1.066)	-1.009 (1.059)	-1.025 (1.096)
NMS-Dummy		-11.662*** (4.387)	-8.874** (4.401)	1.502 (2.704)	4.378 (3.249)
Bank Flows			0.162 (0.189)	0.094 (0.155)	0.079 (0.160)
NMS-Dummy* Bank Flows				0.809*** (0.221)	0.730*** (0.214)
Credit Boom					-0.178* (0.097)
Constant	15.028** (6.438)	5.589 (6.322)	8.118 (6.489)	8.019 (6.396)	8.909 (6.694)
Observations	84	84	84	84	83
Adj. R ²	0.030	0.123	0.158	0.234	0.277
Prob>F	0.214	0.049	0.033	0.000	0.001

Robust standard errors in parentheses. *Significant at the 10% level.

Significant at the 5% level. *Significant at the 1% level.

To test whether cross-border bank flows are related to credit growth, I add to the regression the change in outstanding claims of BIS reporting banks from 2008 to 2012 for every country *i*. Consistent with the graphical assessment, Column 3 of Table 1 suggests that changes in financial flows do not generally explain the difference in domestic credit growth

⁶Alternatively, I could use current account balances as proxy for net financial flows. Since debt flows are more closely linked to credit growth (Calderón and Kubota 2012, Lane and McQuade 2014), a compensation for a fall in foreign bank financing by a rise in equity financing may balance the current account but still result in declining domestic lending.

between countries. The link between credit growth and cross-border bank flows is not stable across countries.

Next, I add the interaction term. The coefficient on the interaction term turns out to be positive and significant (Column 4): a rise in foreign bank assets does have a larger effect on credit growth in EU member countries than in other emerging markets. In other words, if a country is a member of the EU, bank lending hinges more on cross-border financial inflows. Because in the period of observation foreign banks substantially reduced their exposure in the NMS, domestic credit shrank.⁷ In this specification, the coefficient on the NMS-dummy is insignificant. The NMS-dummy in Column 4, however, captures the difference in credit growth with respect to other emerging markets when cross-border bank flows are zero. Therefore, if EU membership affects how financial flows relate to credit growth the interaction term, not the intercept, has to be significant.⁸

Column 5 of Table 1 shows the regression results when controlling for the magnitude of the 2003–2008 *credit boom* in the regression. The negative coefficient on the credit boom variable implies that countries with larger changes in domestic credit to GDP from 2003 to 2008 have seen relatively smaller credit growth thereafter. Therefore, some of the differences in the post-2008 credit development may be attributed to the expansion during the boom. The coefficient on the interaction term is robust to the change, suggesting that cross-border lending has a larger impact on credit growth in the NMS than in other countries.⁹

⁷The joint coefficient is significantly different from zero (<5% level).

⁸By contrast, adding an interaction term and a dummy variable for East Asia would result in a high positive coefficient that remains significant after adding the interaction term. The interaction term does not help explain the difference in credit growth in East Asia.

⁹ See Appendix D for robustness.

4. DID THE CRISIS MAKE A DIFFERENCE?

To determine whether the results are specific to the crisis period only, I repeat the empirical exercise using data for the 2004–2008 period again. The results are presented in Columns 1 and 2 of Table 2. Again, higher financial inflows do not explain domestic lending differences between countries in general. Adding the NMS-dummy and interaction term gives results similar to those for the post-2008 period.

Table 2: Regression Results

	(1) (2004-2008)	(2) (2004-2008)	(3) (Pooled)	(4) (Pooled)
Initial Credit	-0.114* (0.064)	-0.089 (0.063)	-0.017 (0.043)	-0.001 (0.047)
Initial GDP p.c.	3.351*** (1.109)	1.775 (1.181)	0.667 (0.781)	0.642 (0.788)
NMS-Dummy		3.717 (3.822)	-0.788 (2.190)	2.441 (2.443)
Bank Flows	0.188 (0.117)	0.070 (0.077)	0.069 (0.070)	0.053 (0.068)
NMS-Dummy* Bank Flows		0.441*** (0.101)	0.649*** (0.095)	0.508*** (0.095)
NMS-Dummy* Bank Flows*				0.323 (0.235)
Crisis-Dummy Crisis-Dummy				-3.741** (1.702)
Constant	-12.349 (7.51)	-2.402 (7.911)	1.849 (5.002)	3.358 (5.194)
Observations	86	86	170	170
Adj. R ²	0.215	0.368	0.314	0.338
Prob>F	0.003	0.000	0.000	0.000

Robust standard errors in parentheses. *Significant at the 10% level.

Significant at the 5% level. *Significant at the 1% level.

Being an NMS increased the responsiveness of domestic lending to financial inflows in the pre-crisis period as well. Because during this period cross-border lending contributed to domestic credit growth instead of to a shrinkage, the finding is compatible with Friedrich et

al.'s (2013) conclusion that political integration (with the EU) may have benefitted the countries by strengthening the link between financial integration and economic growth.

Pooling the data for the two time periods, the results in column 3 show that, again, the coefficient on the interaction term is robust in size and significant at the 1% level. To test whether these results are driven by the crisis, I add a *euro area crisis* dummy that takes the value 1 in the 2008–2012 period and the value zero in the 2004–2008 period. I combine this dummy with the interaction term that captures the additional effect of cross-border bank flows for NMS and run the regression again.

As shown in column 4, the crisis did not change the relationship between the development of foreign claims and credit growth in the NMS. In both periods, a rise in cross-border claims enhances domestic lending when a country is an EU member. The coefficient on the interaction term that captures whether there is an additional effect in the crisis period remains insignificant at commonly used levels.

5. SUMMARY

This paper shows that, more than in other emerging markets, domestic lending in the NMS depends on the development of cross-border lending. Because the fall in cross-border lending during the period of low interest rates has been of some significance, this finding is not only statistically but also economically significant. The paper further shows that the link between cross-border flows and credit growth cannot be attributed solely to the crisis in Europe. In fact, during the boom period the rise in cross-border lending translated into more rapid domestic credit growth in the NMS than elsewhere.

I interpret the findings as follows. Political integration and the corresponding catch-up expectations made it easier for banks in the NMS to finance domestic lending using foreign

credit during the 2003-2008 boom period. This increased the dependence of domestic lending on global financial conditions relative to other emerging market countries with devastating effects when cross-border lending declines.

Although the post-crisis spillover effects of the euro area's financial deleveraging on domestic lending in the NMS are substantial, we should not forget about the period of rapid growth in the NMS up to 2008. Thus, the paper does not claim that political integration is a problem per se. Certainly the NMS would have been in a better situation if they had quickly adopted "perfect" institutions or if euro area institutions had prevented a severe buildup of financial imbalances in the first place.

Although it is also up to the people in the NMS to push for the implementation of better institutions in these countries, the paper suggests that the EU's economic and political institutions, e.g. the supervisory and regulatory framework or established bailout institutions, will continue to have, for good or ill, an impact on the NMS via financial integration. For the immediate short-term the findings of the study underline the importance of repairing the financial sector in the core European economies for the NMS.

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APPENDIX A: COUNTRY SAMPLE

For graphical illustrations I group countries based on World Bank classifications. However, I also introduce a group for the New Member States of the EU (that includes the countries that have recently been re-classified into the group of advanced economies: Czech Republic, Estonia, Slovak Republic, Slovenia) and separate the South American (SA) from the Central American and Caribbean (CAC) countries.

Country Groups	Countries
New Member States of the EU <i>NMS</i>	Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Republic and Slovenia (since 2004), Bulgaria and Romania (since 2007)
Eastern Europe and Central Asia <i>ECA</i>	Albania, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Croatia, Georgia, Kazakhstan, Kyrgyz Republic, Macedonia, Moldova, Russia, Turkey and Ukraine
Eastern and Southeastern Asia <i>ASIA</i>	Bangladesh, Cambodia, China, India, Indonesia, Malaysia, Mongolia, Nepal, Philippines, Sri Lanka, Thailand and Vietnam
South America <i>SA</i>	Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay and Venezuela
Central America and Caribbean <i>CAC</i>	Costa Rica, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua and Panama
Middle East and Northern Africa <i>MENA</i>	Algeria, Egypt, Iran, Jordan, Lebanon, Libya, Morocco, Tunisia and Yemen
Sub-Saharan Africa <i>SSA</i>	Angola, Benin, Burkina Faso, Burundi, Cameroon, Ivory Coast, Ghana, Kenya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Niger, Nigeria, Senegal, Seychelles, South Africa, Sudan, Tanzania, Togo, Uganda and Zambia

APPENDIX B: DATA DESCRIPTION

DC	Domestic Credit to the Private Sector (% GDP), Annual	World Development Indicators
Δ DC	Absolute Change in DC	
Foreign Assets	Foreign Assets of BIS Reporting Banks (% GDP), Annual	BIS Locational Statistics 6A World Development Indicators
Bank Flows	Absolute Change in Foreign Assets	
Initial Credit	Domestic Credit to the Private Sector (% GDP) in base year, Annual	World Development Indicators
Initial GDP p.c.	Log of GDP per capita (2005 constant prices in USD) in base year, Annual	World Development Indicators
Credit Boom	Absolute Change in Domestic Credit to the Private Sector (% GDP) between 2008 and 2003 (Cross-Sectional Data)	World Development Indicators
CA	Current Account Balance (% GDP), Annual, Cumulated CA when multi-year periods are considered	World Development Indicators
Foreign Banks	Share of Foreign Banks (% Total Banks)	Claessens and van Horen (2014)
Financial Openness	KA-Open, normalized, Annual Averages for periods	Website of Chinn-Ito Index (8/19/2014 update)
Financial Freedom	Sub-index	Website of Heritage Foundation (2014)
Crisis	Banking crisis dummy, 1=Crisis, 0=None	World Bank, Global Financial Development Database
NonPerforming Loans	Share of nonperforming loans as percentage of gross loans (%)	World Bank, Global Financial Development Database
EU Tradeshare	Each country's annual EU (imports + exports) divided by its world (imports + exports) (in %)	IMF Directions of Trade Statistics (DOTS)
Business Cycle Correlation	GDP Growth (%), annual Correlation of growth rates with EU growth rates, 4-year lagged correlation, annual	World Economic Outlook

APPENDIX C: DESCRIPTIVE STATISTICS OF 4-YEAR NON-OVERLAPPING DATA

Variable	Countries	Obs	Mean	Std. Dev.	Min	Max
ΔDC	All	86	3.379	10.275	-22.868	35.236
	Non-EU	77	4.478	9.706	-21.837	35.236
	EU	9	-6.022	10.755	-22.868	6.099
Initial GDP p.c.	All	87	7.648	1.174	5.012	9.938
	Non-EU	77	7.441	1.077	5.012	9.433
	EU	10	9.241	0.437	8.443	9.938
Initial Credit	All	88	41.379	28.700	6.793	147.352
	Non-EU	78	38.138	28.172	6.793	147.352
	EU	10	66.664	19.256	44.989	96.396
Bank Flows	All	88	-0.726	12.929	-37.854	91.603
	Non-EU	78	0.871	12.180	-34.535	91.603
	EU	10	-13.180	12.334	-37.854	0.251
Credit Boom	All	87	11.432	15.267	-23.459	51.708
	Non-EU	77	8.523	13.014	-23.459	51.708
	EU	10	33.836	12.918	13.144	50.265
CA	All	77	-15.466	29.771	-96.315	99.882
	Non-EU	67	-17.086	31.423	-96.315	99.882
	EU	10	-4.612	9.639	-17.823	7.159

APPENDIX D: ROBUSTNESS TESTS

The presented results are robust to the inclusion of the Chinn-Ito index of financial openness. I also tested whether the NMS-dummy merely captures business-cycle correlation with the euro area. Neither the addition of the variable for business-cycle correlation nor the replacement of the NMS-dummy and its interaction term by the variable helps explain the domestic lending variation between countries. Results are also robust to the use of the share of trade with the euro area in percentage of world trade.

Adding a banking-crisis dummy results in a negative coefficient on the dummy. Other coefficients are, however, robust. Controlling for foreign bank presence or the impact of the exchange-rate regime based on the IMF classifications of de facto exchange-rate regimes does not change the results. In fact, I found that even given the share of foreign banks, a fall in foreign bank claims affects domestic credit in the NMS more than in other countries when interacting foreign bank presence with the change in foreign bank claims and the respective interaction term. This suggests the presence of a political-integration effect that increases the link between financial integration and credit growth in the NMS.

Most of the variables I use in estimating the coefficients are predetermined variables that cannot be affected by domestic credit growth in the sample period. The change in cross-border flows is an endogenous variables. To account for possible endogeneity issues and ensure the correct direction of causality, I instrument the financial flow variables with its own lags and re-estimate the equations (as in Lane and McQuade 2014). The interaction term remains significant. Again, results are robust to the use of the current account as net financial flow variable.

Instrumental Variable Regressions Using 4-Year Non-Overlapping Data

	(1)	(2)	(3)	(4)
	2SLS	2SLS	2SLS	2SLS
Initial Credit	0.088 (0.063)	0.110* (0.061)	0.075 (0.061)	0.099* (0.058)
Initial GDP p.c.	-0.626 (1.073)	-0.633 (1.114)	-0.267 (1.172)	-0.380 (1.244)
NMS- Dummy	0.839 (2.758)	3.880 (3.321)	-16.989*** (3.821)	-11.697*** (4.476)
Bank Flows	-0.058 (0.102)	-0.075 (0.114)		
NMS-Dummy* Bank Flows	0.944*** (0.187)	0.863*** (0.173)		
CA			0.012 (0.039)	0.003 (0.039)
NMS-Dummy* CA			-0.958*** (0.235)	-0.844*** (0.226)
Credit Boom		-0.189* (0.102)		-0.194* (0.103)
Constant	5.826 (6.484)	6.701 (6.776)	4.133 (8.264)	5.702 (8.667)
Observations	83	83	73	73
R ²	0.206	0.248	0.227	0.281
Prob>F	0.000	0.000	0.001	0.001

Robust standard errors in parentheses. *Significant at the 10% level. **Significant at the 5% level.

***Significant at the 1% level.