

Kaya, Ahmet Ihsan; de Haan, Jakob

Article

Capital flows, EU integration and the global financial crisis: An empirical analysis

Journal of Applied Economics

Provided in Cooperation with:

University of CEMA, Buenos Aires

Suggested Citation: Kaya, Ahmet Ihsan; de Haan, Jakob (2022) : Capital flows, EU integration and the global financial crisis: An empirical analysis, Journal of Applied Economics, ISSN 1667-6726, Taylor & Francis, Abingdon, Vol. 25, Iss. 1, pp. 1025-1049, <https://doi.org/10.1080/15140326.2022.2099726>

This Version is available at:

<https://hdl.handle.net/10419/314197>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



<https://creativecommons.org/licenses/by/4.0/>



Capital flows, EU integration and the global financial crisis: an empirical analysis

Ahmet Ihsan Kaya & Jakob de Haan

To cite this article: Ahmet Ihsan Kaya & Jakob de Haan (2022) Capital flows, EU integration and the global financial crisis: an empirical analysis, *Journal of Applied Economics*, 25:1, 1025-1049, DOI: [10.1080/15140326.2022.2099726](https://doi.org/10.1080/15140326.2022.2099726)

To link to this article: <https://doi.org/10.1080/15140326.2022.2099726>



© 2022 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



Published online: 25 Jul 2022.



Submit your article to this journal [↗](#)



Article views: 1438



View related articles [↗](#)




View Crossmark data [↗](#)



Citing articles: 1 View citing articles [↗](#)

Capital flows, EU integration and the global financial crisis: an empirical analysis

Ahmet Ihsan Kaya^a and Jakob de Haan^{b,c} 

^aEconomic and Prosperity, British Embassy, Ankara, Turkey; ^bFaculty of Economics and Business, University of Groningen, Groningen, The Netherlands; ^cCESifo, Munich, Germany

ABSTRACT

We investigate the impact of European Union (EU) integration on capital flows to prospective new EU member states. Using annual data between 1992 and 2020, our results suggest that although EU integration increased net capital flows before the Global Financial Crisis (GFC), it was not able to shield countries from the general decline in capital flows that occurred after the GFC. Furthermore, the results show that the impact of EU integration mainly runs through improved institutional quality. We also find considerable heterogeneity in the drivers of different types of capital flows (FDI, portfolio investments, and other capital flows) that we consider.

ARTICLE HISTORY

Received 28 March 2022

Accepted 6 July 2022

KEYWORDS

Capital flows; European Union integration; global financial crisis; fixed effects panel data model

SUBJECT CLASSIFICATION CODES

C33; F21; F36

1. Introduction

The impact of capital flows on the economic performance of host countries has received a lot of attention. There seems to be a consensus among economists that the costs and benefits of capital flows differ across various types of capital flows. While short-term and fickle types of foreign capital may introduce financial stability risks and expose countries to the global financial cycle (Rey, 2015), long-term and stable capital flows may help countries in financing their investments, lowering their capital costs, diversifying the funding risks and transferring technology (Magud, Reinhart, & Vesperoni, 2014; Rossi, 2007). Additionally, capital inflows may bring benefits through their impact on domestic financial development, institutional quality, corporate governance, and macroeconomic policies (Kose, Prasad, Rogoff, & Wei, 2009).

This paper examines the impact of European Union (EU) integration on capital flows (FDI, portfolio flows and other capital flows) to prospective new member states. It is widely believed that EU integration leads to better domestic institutional quality (Schönfelder & Wagner, 2016), which may have led to more capital inflows to prospective member states. However, as shown in Figure 1, capital flows to the region lost momentum after the Global Financial Crisis (GFC). This coincided with the beginning of some of the countries' full EU membership status. The difference between pre- and post-GFC capital flows is most pronounced for countries that are full EU members. Before the GFC, average net capital flows to EU members in our sample amounted to 10.2% of GDP, whereas it declined to −0.1% of GDP after the crisis. The biggest difference occurred in the category of other capital flows (mostly

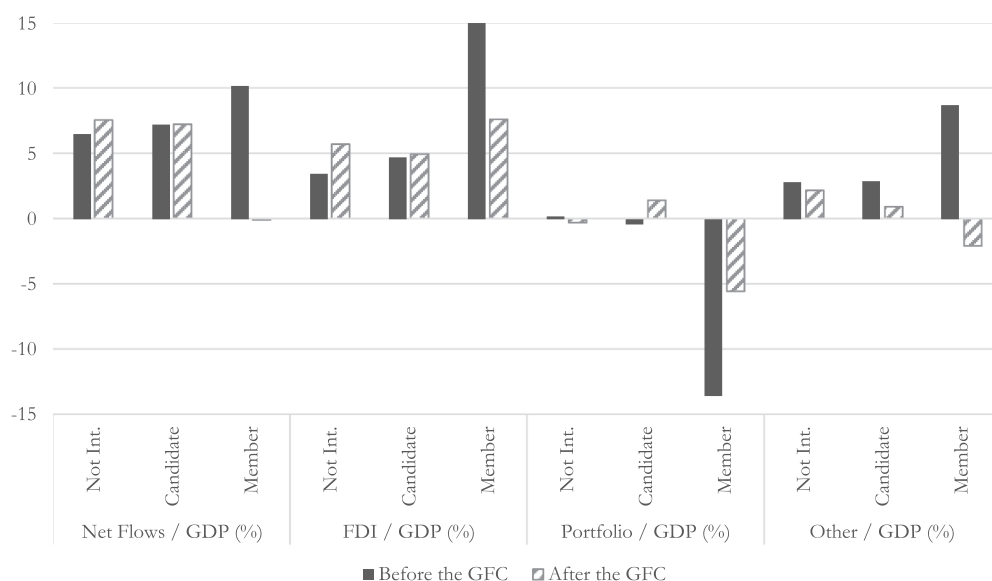


Figure 1. Average capital flows by type, integration status and the GFC.

bank credit) which declined from 8.8% of GDP before the crisis to –2.1% of GDP after the crisis. However, average net capital flows to the countries in our sample which did not integrate with the EU increased from 6.5% before the GFC to 7.5% after the GFC.¹ These stylized facts significantly contradict the popular narrative that EU integration fosters capital flows to member states by eliminating barriers to foreign entry to domestic financial systems and warrant further analysis on the links between capital flows, EU integration, and the GFC.

Some previous studies have investigated capital flows to Central and Eastern European (CEE) countries, suggesting that the EU accession process had a positive influence on foreign direct investment (FDI) in the CEE countries (cf. Bandelj, 2010; Bevan & Estrin, 2004; Clausing & Dorobantu, 2005; Jimborean & Kelber, 2017). However, these studies ignore portfolio investments and other capital flows, which make up a significant portion of the total capital flows into the region. Furthermore, apart from Jimborean and Kelber (2017), these studies also do not consider the impact of the GFC, which significantly changed the behaviour of capital flows.

This study contributes to the literature as follows. First, we investigate the impact of EU integration on capital flows to all countries that entered the process of becoming an EU member state. So, in contrast to previous studies which focused on CEE countries, we consider the impact of EU integration on capital inflows for all countries that at some point were considered by the EU as a potential new member. To this end, net capital flows are regressed on EU candidacy and membership dummies as well as several global and domestic control variables suggested in the literature.² We estimate a panel fixed

¹Table A1 in the online Appendix provides country-specific capital flows by integration status, type of capital flows, and pre- and post- GFC period.

²Some recent studies (e.g., Mercado, 2018) use bilateral capital flows. This type of data would allow us to estimate a gravity model as done in some recent studies (Bruno et al., 2021; Dorakh, 2020). Unfortunately, data availability makes it impossible to follow this approach for all countries in our sample.

effects model for our purpose. Second, we examine whether the impact of EU integration on capital inflows only works through improved domestic institutional quality in the host country. We do so by employing sequential g-estimation suggested by Acharya, Blackwell, and Sen (2016) which allows estimating the direct effects of EU integration while controlling for improved institutional quality. Third, whereas most previous studies examined the impact of EU integration on FDI, we consider three types of capital inflows. Apart from FDI, we also analyse the impact of the EU accession process on portfolio investments and other capital inflows. As these different types of flows may be driven by different factors (Hannan, 2017), our analysis offers insights about the importance of global and domestic factors. Finally, we examine the influence of the GFC, which most previous studies ignored, as the capital flow patterns are very different before and after this crisis.

Our results suggest that the GFC significantly affected the impact of EU integration on capital flows. We find that before the GFC, EU integration increased net capital flows to prospective new members. However, EU integration was not able to shield countries from the general decline in capital flows that occurred during and after the GFC. In addition, our findings indicate that the positive impact of EU integration mainly worked through improved domestic institutional quality. The lack of progress in enhancing institutional quality after these countries became EU member partly explains the winding down of capital flows to the region. We also find considerable heterogeneity in the drivers of different types of capital flows (FDI, portfolio investments, and other capital flows). For instance, EU integration positively affected other capital flows (mainly bank credit), but did not increase portfolio investments before the crisis. Our results are robust to a dynamic panel data model with fixed effects and excluding countries in our sample that do not have a communist past.

The rest of the paper is organized as follows. Section 2 outlines the literature on the drivers of capital flows and the impact of EU integration. Section 3 describes the data and methodology. Section 4 presents the estimation results and offers a robustness analysis. The last section concludes.

2. A brief overview of the empirical literature

Most studies analysing factors affecting capital flows distinguish them as push (global) and pull (domestic) factors following the seminal contributions of Calvo, Leiderman, and Reinhart (1993) and Fernandez-Arias (1996). Calvo et al. (1993) investigate the role of external factors in explaining capital flows to Latin America and find that low interest rates, recessions and the US balance of payments play an important role. Fernandez-Arias (1996) also supports the “push” story, reporting that declining global interest rates have been the most important determinant of private capital inflows to middle-income countries after 1989. Ahmed and Zlate (2014) show that growth and interest rate differentials between emerging markets (EM) and advanced countries (AC) are the main driving force behind EM capital flows. Alfaro, Kalemli-Ozcan, and Volosovych (2008) and Papaioannou (2009) focus on the importance of domestic institutions to explain the “Lucas Paradox”, which is the lack of empirical evidence on the neo-classical premise that capital should flow from rich to poor countries. Based on different methodologies and samples, they suggest that the leading explanation is developing countries’

institutional backwardness. Exploring the same phenomenon, Akhtaruzzaman, Hajzler, and Owen (2018) show that although institutional quality is an important driver of capital flows, it does not solve the Lucas paradox and the level of development remains a significant determinant.

Some studies, such as Baek (2006) and De Vita and Kyaw (2008), turn their attention to specific types of flows instead of focusing on aggregated capital flows. The former study finds that portfolio investments were mainly pushed by external factors such as risk appetite of investors in Asia, while external financial factors played a role in portfolio inflows in Latin America together with domestic GDP growth. The latter study argues that real shocks from foreign output and domestic productivity explain most of the variations in FDI and portfolio investment flows in developing countries. Brafu-Insaidoo and Biekpe (2014) suggest that capital flows are affected by financial liberalization and regionalism. Using data from Sub-Saharan African countries, they find that FDI inflows benefit from liberalization while debt inflows are sensitive to deregulation of foreign borrowing. In addition, regionalism improves FDI inflows but has no influence on other types of capital flows.

Recent literature focuses on the determinants of extreme episodes of capital flows. These studies first identify “surges” and “sudden stops” and then analyse the impact of push and pull factors on those extreme flows (Forbes & Warnock, 2012; Ghosh, Qureshi, Kim, & Zalduendo, 2014; Kaya, Erden, & Ozkan, 2020; Li, de Haan, & Scholtens, 2018, 2019; Qureshi & Sugawara, 2018; Reinhart & Reinhart, 2008). Based on different methods to detect surges and stops, these studies consistently reveal the importance of economic growth and interest rates, global risk aversion and global liquidity among push factors and domestic GDP growth, interest rates, trade and financial openness and domestic institutional quality among pull factors.

Although it is widely acknowledged that the ACs and EMs differ in terms of forces that attract capital flows, the heterogeneity among EMs regarding size, economic structure and level of development has been rarely studied. Recently, Kang and Kim (2019) investigated this heterogeneity by grouping EMs as Asia, Eastern Europe, Latin America and others. Their findings suggest that the impact of push factors on capital flows differs across groups of EMs. In explaining net flows, only domestic GDP growth is significantly positive for Latin American countries, while the US interest rate is the only significant factor for Eastern European countries. In Asian countries, however, various global and domestic factors affect capital flows.

Despite the massive literature on the determinants of capital flows to developing countries, the impact of EU integration on capital flows to new and prospective EU members has received limited attention and previous studies only consider FDI. Kinoshita and Campos (2003) examine the locational determinants of FDI in 25 transition countries between 1990 and 1998. Their results show that agglomeration effects, institutional quality and trade openness are the most prominent determinants. They also find that the most crucial factors for FDI in the Commonwealth of Independent (CIS) countries are natural resources and infrastructure, while agglomeration effects are only significant for non-CIS countries. Bevan and Estrin (2004) show that the announcement of the beginning of the EU entry negotiations after the Cologne meeting in 1998 had a significantly positive impact on FDI inflows after controlling for gravity factors and unit labour cost differences.

Clausing and Dorobantu (2005) also analyse the impact of key EU announcements in 1993 and 1998 about the accession process of CEE countries on FDI inflows. Their results suggest that along with market size and cost-minimizing motives, EU integration announcements have a statistically and economically important impact on FDI flows to the candidate CEE countries. Janicki and Wunnava (2004) examine the FDI determinants of EU accession candidates and find that economic size, country risk, labour costs, and trade openness are key determinants. Bandelj (2010) shows that EU integration indirectly influences FDI inflows to CEE through its impact on state decision-making and country legacies, instead of a direct effect due to reduced investment risks. Jimborean and Kelber (2017) find that EU membership provides an additional impact in terms of FDI inflows in the CEE countries even when other domestic and external factors, as well as the 2007 and 2011 crises, are considered. Recent studies employ a gravity model to analyse the impact of EU membership on inward FDI by exploiting bilateral data. Among them, Jirasavetakul and Rahman (2018) and Dorakh (2020) find that EU accession significantly improved FDI inflows in new member states and Western Balkans after controlling for gravity as well as institutional factors.

Bruno, Campos, and Estrin (2021) also employ a gravity framework on annual bilateral FDI data for a large set of countries from 1985 to 2018 and find that EU membership leads to about 60 per cent higher FDI investment into the host economy from outside the EU, and around 50 per cent higher intra-EU FDI. Finally, Harkmann and Staehr (2021) argue that drivers of net capital flows differ across exchange rate regimes in the CEE countries. Based on data for EU member CEE countries, they show that the current account is driven by pull factors in the countries with a floating exchange rate regime while push factors are more dominant in fixed exchange rate regimes.

3. Data and methodology

The data covers the period between 1992 to 2020. As for the dependent variable, we first consider net capital flows³ and then distinguish between different types of net capital flows, namely FDI, portfolio investments, and other capital flows (mostly bank credit) to grasp the possibly heterogeneous impact of EU integration and control variables on different types of capital flows (Hannan, 2017). The main source for capital flows is the IMF BOP Database, which covers annual data starting from 1970. However, the data is only available for most of these countries starting from the 1990s, which prevented us to consider a longer period.

The control variables based on the previous literature are included one by one, starting with institutional quality.⁴ To consider domestic institutions, we use the Worldwide Governance Indicators (WGI), which measures the institutional quality in six dimensions by Kaufmann, Kraay, and Mastruzzi (2011). We constructed a composite index by

³Some scholars consider gross flows for several reasons (Ahmed & Zlate, 2014). However, as Ghosh et al. (2014) argue, the gross inflow and outflow distinction is not as important for EMs as it is for ACs since gross flows do not require any real resource transfer and outflows may offset inflows, thus they may have little impact on saving and investment decisions in host countries.

⁴As discussed by Schönfelder and Wagner (2016), EU integration requires a candidate country to undertake a comprehensive legal and institutional reform process that will improve institutional quality. Therefore, in order to minimize multicollinearity between institutional quality and EU integration, we use the lagged first difference of the institutional quality index.

factor analysis using six sub-components of the WGI (see Tables A3 and A4 in the online Appendix for details). As to the global push factors, we utilize real interest rates on 10-year US government bonds to reflect global financial conditions similar to Fernandez-Arias (1996). In addition, because of the ultra-loose monetary policies of ACs following the GFC, global liquidity reached unprecedented levels and this excess liquidity contributed to surges in capital flows into developing countries. To capture this effect, we include the change in global liquidity which is calculated as the GDP-weighted sum of the reference monetary aggregates of the US, Euro Area, Japan, and the UK as in Beckmann, Belke, and Czudaj (2014) and Forbes and Warnock (2012).⁵

We also include domestic real interest rates and GDP growth as control variables. Since adequate government bond data is not available in most of the countries in our sample, we mainly rely on deposit interest rates and extend it with benchmark government bond yields or monetary policy interest rates for some countries.⁶ Descriptive statistics presented in Table 1 shows some outliers for net FDI and net portfolio investment flows mainly because of the large variations in flows to Cyprus and Malta, which are excluded from the respective regressions. Detailed explanations and data sources of all variables are presented in Table A2 in the online Appendix.

We check the cross-correlations and variance inflation factors (VIF) to see whether there is a possible multicollinearity problem in the regression analysis if we include all explanatory variables. Details are in Tables A5 and A6 in the online Appendix. The highest correlation among the variable pairs is between the post-GFC dummy and global liquidity (0.849). The candidacy and membership dummies are negatively correlated with US real interest rates (correlations are -0.509 and -0.488 , respectively) and are positively correlated with institutional quality (0.546 and 0.584, respectively). Additionally, the results of the VIF analysis show that apart from the GFC dummy and the interaction variables of EU integration and GFC, the VIF calculations of explanatory variables range between 1 to 4. As a rule of thumb, values less than 4 imply low to moderate multicollinearity in regression analysis. Together with the low and moderate correlations between variables, these results imply that including all variables together into the model will not lead to serious multicollinearity problems.

We start by examining the impact of the GFC and EU integration on capital flows to the countries in our sample. Then, we add several global and domestic drivers of capital flows as suggested by previous studies to check whether the impact of EU integration is robust. The econometric model that will be analysed is as follows:

$$CF_{it}^k = \alpha_i + \beta_1 GFC_{it} + \beta_2 EU_{it}^l + \beta_3 EU_{it}^l * GFC_{it} + \sum \gamma_j X_{it}^c + \varepsilon_{it} \quad (1)$$

where CF_{it}^k is capital flows as a percentage of GDP by type k (net capital flows, FDI, portfolio investments, and other capital inflows) for country i in year t , α_i are the unobserved country-specific effects, and GFC_{it} is a dummy variable capturing the impact

⁵We also included world GDP growth, the S&P 500 index volatility (VIX) and European policy uncertainty (EPU) index (Baker, Bloom, & Davis, 2016) as other potential global factors, but they are not found to be statistically significant in any of the specifications. Likewise, real effective exchange rate (REER) deviations and financial openness as measured by Chinn and Ito (2008) are included but are not found to be statistically significant.

⁶For Estonia, Latvia, Lithuania, and Malta harmonized Euro Area interest rates are employed. For Cyprus, Slovakia, and Slovenia benchmark government bond yields are utilized, while for Poland monetary policy interest rates are used.

Table 1. Descriptive Statistics.

	No Integration					Candidacy					Membership				
	Obs.	Mean	St. Dev.	Min	Max	Obs.	Mean	St. Dev.	Min	Max	Obs.	Mean	St. Dev.	Min	Max
Net Flows/GDP (%)	157	6.8	7.1	-16.8	51.1	144	7.3	5.2	-4.1	33.3	206	2.6	7.3	-12.2	43.8
FDI/GDP (%)	157	4.0	4.4	0.1	36.2	144	4.8	3.9	-9.0	22.1	206	9.6	32.3	-77.0	264.4
Portfolio Inv./GDP (%)	137	0.1	2.9	-12.3	10.2	144	0.3	3.9	-29.2	10.3	206	-7.7	33.3	-231.8	72.8
Other Inv./GDP (%)	157	2.7	5.2	-19.7	30.2	144	2.2	4.6	-9.9	26.0	206	0.7	17.4	-58.4	84.7
US Real Interest Rates (%)	184	2.8	1.4	-0.4	4.5	144	1.8	1.3	-0.4	3.7	206	0.9	1.0	-0.4	3.6
Global Liquidity (% of GDP)	184	83.5	10.9	70.0	112.6	144	85.4	13.8	70.0	112.6	206	97.7	8.5	82.9	112.6
GDP Growth (%)	160	4.2	8.6	-14.1	89.0	144	3.6	3.9	-15.3	19.7	206	2.6	4.3	-14.8	12.0
Dom. Real Interest Rates (%)	169	-3.1	39.3	-91.4	434.5	144	1.0	5.5	-15.7	20.3	206	0.4	2.4	-7.1	6.3
Institutional Quality	117	-0.8	0.9	-1.9	1.3	144	-0.1	0.8	-1.5	1.6	206	0.7	0.6	-0.6	1.6

of the GFC that takes 1 after 2009 until the end of the sample period and 0 otherwise.⁷ EU_{it} stands for integration dummies by status l (candidacy and membership) which take the value of 1 after a country gains the candidacy or membership status, and 0 otherwise.⁸

In this specification, β_1 shows the impact of the GFC on capital flows, β_2 shows the impact of EU candidacy or membership status and β_3 shows whether the impact of EU integration is different before and after the financial crisis. Note that the candidacy dummy remains one after a country has become EU member, so that when we include this dummy, we test whether EU integration has an impact on capital flows. The coefficient of the membership dummy examines whether EU membership has a separate effect on capital flows. We then include several global and domestic variables similar to the literature, where X_{it}^c and γ_j are vectors of (coefficients of) control variables.

Although most countries in our sample have a lot in common, i.e., shared background and common objective to be part of the EU, there are striking economic and institutional differences among them. Most importantly, the sample varies in economic size and population. Even though we scale variables with GDP, these differences may create significant heterogeneity in terms of the impact of drivers of capital flows in those countries. Ignoring this heterogeneity among cross-sections may yield inconsistent coefficient estimations (Baltagi, 2013). Pesaran and Smith (1995) and Pesaran (2006) propose the mean group (MG) and the common correlated effects (CCE) estimators which both take into account the cross-sectional heterogeneity and the latter is also robust to cross-sectional dependence. However, as the underlying methodologies of the MG and the CCE estimators require separate time-series regressions for each cross-section, they are only suitable if the time dimension is large enough, which is not the case in our sample. The CCE pooled estimator by Pesaran (2006) controls for cross-section dependence but it does not allow heterogeneous parameters of the determinants of capital flows. We do not use the CCE pooled estimator, because we only find cross-sectional dependence in net capital flows regressions but not in other models. In addition, the CCE pooled estimator includes cross-sectional averages of each variable into the model for all countries. Given that we have 20 countries and 8 independent variables to be estimated, this increases the number of parameters to be estimated to 169, which does not allow us to perform feasible estimation. Similarly, estimating country VAR models (cf. Calvo et al., 1993) requires much longer time series than are available for most countries in our sample. Panel VAR models are not used as well, since the research question requires us to use dummy variables and the interpretation of impulse response functions of binary variables is problematic. Therefore, in order to control for unobserved cross-country heterogeneity, we use the fixed effects estimator.

After the base regression models, we turn our attention to examining whether there is an independent impact of EU integration on capital inflows apart from that of improving domestic institutional quality. As Acharya et al. (2016) argue, if the impact of a treatment on the outcome disappears with the inclusion of a mediator, then this might indicate biased estimates. In such a case, they suggest using sequential g-estimation to obtain

⁷The choice of this dummy is based on Bai and Perron (1998) breakpoint tests which provide strong evidence for a break in capital flows around the time of the GFC. We do not find strong evidence for other breaks in our sample.

⁸For instance, Bulgaria became an official candidate in 1998 and then a full member in 2007. The candidacy dummy for Bulgaria equals 0 until 1998 and 1 from 1998 onwards, while the membership dummy equals 0 until 2007 and 1 from 2007 onwards.

“controlled direct effects”, which is a two-step regression procedure that can avert the bias under certain conditions. In our case, institutional quality plays a mediating role in transmitting the impact of EU integration on capital flows and this approach may potentially thus lead to biased parameter estimation. Therefore, we apply their method to check if EU integration has some additional direct effect on capital flows other than improving domestic institutional quality.

We then apply two different robustness check. First, capital flows may show persistence as international investors tend to invest more in countries in which they have previous experiences. This is especially true for FDI flows, which tend to be more stable. For this reason, we also consider the dynamic nature of the capital flows by including the lag of the flows into the model. The inclusion of the lagged dependent variable in fixed effects panel data models yields biased and inconsistent estimations (Nickell, 1981) since the individual-specific effects and the error terms would be correlated (Baltagi, 2013). However, as shown by Alvarez and Arellano (2003), if the time dimension is greater than the cross-sectional dimension, the fixed effects estimator is less biased than the difference GMM estimator in a dynamic panel data setting. Therefore, instead of utilizing a GMM estimator as proposed by Arellano and Bover (1995) and Blundell and Bond (1998), which are mainly designed for small T and large N, we estimate the dynamic model with a fixed effects estimator.

Finally, most of the countries in our sample are former Eastern Bloc countries, but Cyprus, Malta and Turkey do not have a communist legacy. Although we use country-specific fixed effects to control for unobserved heterogeneities, these countries may be fundamentally different from the others. Therefore, in a sensitivity analysis we exclude these countries from the sample and only focus on former Eastern Bloc countries.

4. Empirical results

4.1. Baseline regression models for net capital flows

Estimation results for the baseline regression models for net capital flows are presented in Table 2. The first columns in each panel show the impact of GFC, EU integration captured by the candidacy and membership dummies, and the interaction between the GFC and integration dummies. Other columns include the control variables which are included to the model one by one. Both coefficients of the EU integration dummies are significantly positive before the GFC. However, EU integration was not able to shield candidate and member countries from the general decline in capital flows that occurred after the GFC. In candidate (member) countries the net-capital-flows-to-GDP ratio was higher by 3.3 (4.2) percentage points before the GFC, while it declined by 6.5 (7.9) percentage points after the GFC. These findings confirm the stylized facts presented in Figure 1 and Table A1.

Next, we extend the base model to explore whether our findings hold when we include control variables that previous studies found to be correlated with capital flows. Importantly, the coefficients on the interaction between EU integration and the GFC remain significantly negative, which shows that even after considering control variables, our main finding that EU integration could not prevent the decline of capital flows after the GFC holds. The results also show that institutional quality has a strong

Table 2. Baseline Regression Models for Net Capital Flows.

	Candidacy				Membership							
Post-GFC Dummy	-1.669 (1.551)	-1.513 (1.396)	-2.107 (1.475)	-1.809 (1.472)	-2.799 (2.023)	-1.748 (2.105)	-2.752 (2.288)	-2.281 (1.665)	-2.785 (1.625)	-2.375 (1.560)	-2.960* (1.668)	-2.096 (1.733)
EU Int. Dummy	3.332** (1.254)	3.125 (2.165)	2.568 (2.164)	2.737 (2.119)	2.272 (2.012)	2.183 (1.993)	4.197** (1.672)	3.432** (1.562)	2.645 (1.548)	2.618 (1.524)	3.021* (1.512)	2.989* (1.529)
EU Int. x GFC	-6.464*** (1.744)	-6.417*** (1.794)	-6.543*** (1.832)	-6.410*** (1.822)	-5.064** (2.264)	-5.168** (2.221)	-7.917** (3.136)	-8.343*** (2.703)	-7.970*** (2.656)	-7.924*** (2.648)	-7.079** (2.689)	-7.028** (2.643)
Inst. Quality (Lag, diff.)		3.673 (2.543)	4.619 (2.729)	3.892 (2.737)	3.984 (2.445)	3.652 (2.565)		5.085** (2.282)	5.797** (2.515)	5.029* (2.528)	4.889** (2.275)	4.590* (2.377)
US 10 YR Real Int.			-0.694** (0.259)	-0.459* (0.248)	-0.325 (0.219)	-0.110 (0.238)			-0.505* (0.245)	-0.282 (0.252)	-0.104 (0.225)	0.100 (0.281)
Global Liq. (diff.)				0.148** (0.057)	0.143** (0.058)	0.205*** (0.055)				0.147** (0.059)	0.142** (0.060)	0.200*** (0.057)
Real Interest Rates					-0.171*** (0.031)	-0.184*** (0.029)					-0.165*** (0.031)	-0.178*** (0.031)
GDP Growth						0.191* (0.103)					0.179* (0.092)	
Observations	507	429	429	429	429	429	507	429	429	429	429	429
R-squared	0.288	0.340	0.354	0.369	0.390	0.400	0.307	0.381	0.388	0.403	0.422	0.431

Notes: 1) EU Integration dummy implies the candidacy status for the first 6 columns and the membership status for others. 2) Country-specific fixed effects included in all models. 3) Standard errors in parentheses are clustered by countries. * p < 0.10, ** p < 0.05, *** p < 0.01

positive impact on net capital flows when we use membership dummy as a proxy for EU integration. This finding is in line with the studies by Alfaro et al. (2008), Papaioannou (2009), and Jirasavetakul and Rahman (2018). Although we do not find a statistically significant effect in the candidacy regressions, a one-point increase in the change in institutional quality score corresponds to a 4.6 to 5.8 percentage points increase in the net capital flows-to-GDP ratio in the membership regressions. In addition, inclusion of the institutional quality variable causes the EU integration dummies to become insignificant in most cases. This suggests that the positive effect of EU integration on capital flows mostly runs through improved institutional quality, which we will analyse further below.

The remaining columns of Table 2 add global and domestic controls to the analysis one by one. The results suggest that higher US interest rates are associated with lower capital flows to the region. Although it is not robust to presence of other control variables, this finding is in line with the results of previous studies (Koepke, 2019). Similar to the studies by Ghosh et al. (2014), Lim and Mohapatra (2016), and Yang, Shi, Wang, and Jing (2019), the change in global liquidity has a positive impact on net capital flows. We also find that the impact of real domestic interest rates on net flows is negative. This finding may reflect that higher interest rates might be the result of the higher risk that these countries face, which causes global investors to divert their investments. Domestic GDP growth exerts a positive impact on net capital flows similar to findings reported in the literature (Koepke, 2019). It is also worth noting that the results for the control variables are not considerably different across models using candidacy or membership dummies as proxy for EU integration, apart from the institutional quality.

4.2. Regression models for different types of capital flows

Table 3 presents the full model estimation results for net FDI, net portfolio investments, and net other capital flows. Overall, we observe that the explanatory power and the number of significant variables decline considerably in the models that investigate the determinants of different types of flows. The first thing we notice is that the impact of EU integration on different types of flows seems to be heterogeneous. We do not find any significant relationship between EU integration and FDI inflows in contrast to the literature in which the impact of the GFC was not considered (cf. Bandelj, 2010; Clausing & Dorobantu, 2005; Dorakh, 2020). Interestingly, and in line with the results of Table A1, portfolio investments follow a very different pattern. While the candidacy dummy is not significant, suggesting no impact of EU integration, membership status had an overall negative impact on portfolio investments. However, EU integration has a strong positive impact on net other capital flows which consists mainly of bank credit, but this effect was not strong enough to withstand the negative impact of the GFC in the case of membership. This result is in line with the findings of Hoffmann (2012) who argues that carry trade to CEE became unprofitable as the liquidity risk and the volatility of exchange rates increased with global financial turmoil. Change in institutional quality is only significant in the net other capital flows regression, in addition to the significant positive impact of EU integration.

Table 3. Regression Models by Different Capital Flow Instruments.

	Candidacy			Membership		
	FDI/GDP	Portfolio/GDP	Other/GDP	FDI/GDP	Portfolio/GDP	Other/GDP
Post-GFC Dummy	1.334 (2.483)	-0.153 (0.532)	-3.054 (2.196)	-0.572 (1.161)	0.268 (0.370)	-1.953 (1.481)
EU Int. Dummy	1.156 (1.415)	0.351 (0.675)	2.835** (1.320)	0.018 (0.794)	-1.286** (0.604)	5.925** (2.434)
EU Int. x GFC	-3.646 (2.573)	-0.223 (0.726)	-3.370 (2.383)	-1.738 (1.637)	-0.232 (0.745)	-8.013*** (2.296)
Institutional Quality (Lag, diff.)	-0.797 (1.535)	0.069 (1.668)	5.991** (2.579)	-0.349 (1.725)	0.231 (1.647)	6.502** (2.395)
US 10 YR Real Int.	0.100 (0.131)	-0.037 (0.137)	-0.338 (0.534)	0.099 (0.234)	-0.188 (0.147)	0.126 (0.750)
Global Liq. (diff.)	0.038 (0.035)	-0.029 (0.030)	0.154** (0.070)	0.038 (0.037)	-0.027 (0.029)	0.144** (0.066)
Real Interest Rates	-0.038** (0.016)	0.012 (0.047)	-0.128*** (0.041)	-0.045** (0.021)	0.041 (0.049)	-0.135*** (0.046)
GDP Growth	0.101* (0.049)	-0.080 (0.070)	0.082 (0.166)	0.094* (0.052)	-0.074 (0.065)	0.073 (0.149)
Observations	383	375	429	383	375	429
R-squared	0.176	0.007	0.070	0.155	0.020	0.087

Notes: 1) EU Integration dummy implies the candidacy status for the first 3 columns and the membership status for others. 2) Country-specific fixed effects included in all models. 3) Cyprus and Malta are excluded from the net FDI and portfolio inflow regressions due to outliers. 4) Standard errors in parentheses are clustered by countries. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

As to global variables, although we find no relation between US interest rates and different capital instruments, global liquidity affects net other capital flows positively while it is insignificant for net FDI and net portfolio flows. The former finding probably reflects that FDI flows are less related to the global financial cycle, but are largely driven by multinational companies' micro-level strategic decisions in line with the ownership, location and internalization (OLI) framework (Dunning, 1981).⁹ Among domestic variables, real interest rates affect FDI inflows and other capital flows negatively, while its impact on portfolio investments is insignificant. Domestic GDP growth has a positive impact on FDI inflows, but this finding is only significant at 10 percent level in both definitions of EU integration. For other specifications, we find no significant relationship between domestic GDP growth and different types of capital flows.

4.3. Controlled direct effect of EU integration

As we have discussed above, the EU integration process serves as an anchor for large scale legal and institutional reforms that promote democracy and rule of law, improve government efficiency, and fundamental freedoms. The empirical literature consistently shows a close link between institutional quality and capital flows. Considering this, we analyse whether the positive link between EU integration and capital flows is just because of the improved institutional quality or whether there is an independent direct effect of EU integration on capital flows after controlling for institutional quality. Acharya et al. (2016) suggest transforming the dependent variable by removing the effect of the

⁹According to this approach, the multinational companies' decision to engage in FDI depends on whether the firm benefits from the ownership, location and internalization advantages. Otherwise, it would be more profitable for a firm to provide licensing or engage in trade.

Table 4. Estimation Results of Sequential g-estimation.

	Candidacy				Membership			
	CF/GDP	FDI/GDP	Portfolio/ GDP	Other/ GDP	CF/GDP	FDI/GDP	Portfolio/ GDP	Other/ GDP
Post-GFC Dummy	-2.555* (1.314)	-0.248 (2.197)	0.155 (0.500)	-2.084 (2.397)	-2.355 (1.450)	0.204 (1.682)	0.033 (0.591)	-2.626* (1.233)
EU Int. Dummy	0.406 (1.838)	2.179* (1.063)	-0.725 (0.822)	0.890 (2.471)	-0.036 (1.546)	-0.511 (0.595)	-1.834 (1.363)	3.834* (1.918)
EU Int. x GFC	-5.610** (2.125)	-2.067 (2.324)	0.514 (0.952)	-6.490** (2.531)	-7.377** (2.926)	-3.026 (2.032)	0.833 (1.123)	-7.887** (2.958)
GDP Growth	0.211** (0.094)	0.120*** (0.026)	-0.019 (0.053)	-0.059 (0.203)	0.168** (0.075)	0.110*** (0.032)	-0.035 (0.048)	-0.068 (0.181)
Trade Openness	-0.038 (0.028)	0.002 (0.020)	-0.034 (0.020)	-0.015 (0.059)	-0.011 (0.032)	0.019 (0.027)	-0.015 (0.031)	-0.015 (0.060)
Financial Openness	0.894* (0.439)	-0.057 (0.230)	0.102 (0.133)	1.480 (1.357)	1.025** (0.388)	0.139 (0.286)	0.220 (0.159)	1.067 (1.157)
Financial Development	29.549*** (8.743)	-1.219 (5.551)	6.336* (3.278)	23.360** (10.052)	24.285** (9.044)	0.190 (5.940)	9.528 (5.531)	11.705 (10.724)
Observations	366	320	312	366	366	320	312	366
R-squared	0.487	0.376	0.104	0.087	0.517	0.385	0.116	0.093

Notes: 1) Dependent variables are demediated capital flows obtained from removing the impact of institutional quality from the first stage regression models consisting all pre-treatment and intermediate covariates. 2) EU Integration dummy implies the candidacy status for the first 4 columns and the membership status afterwards. 3) Country-specific fixed effects included in all models. 4) The first stage regression results are not shown in the table but available upon request. 5) Standard errors in parentheses are clustered by countries. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

mediator and then estimating the impact of the treatment on this demediated outcome. Such a two-step procedure should be designed by partitioning the covariates into pre-treatment and intermediate confounders. In the first step, both pre-treatment and intermediate confounders as well as treatment and mediator variables are included into the regression model to avoid potential omitted variable bias. In the second step, treatment and pre-treatment variables are regressed to the demediated outcome to obtain the controlled direct effect of treatment.

We consider GDP growth, trade openness, financial openness and financial development as pre-treatment variables because these have potentially caused countries to integrate into the EU in the past while keeping other explanatory variables (US interest rates, global liquidity and real domestic interest rates) as intermediate confounders. Table 4 presents the second stage regression results of this analysis. As shown, EU integration dummies are mostly insignificant confirming the previous finding that the effect of EU integration on capital flows to new and prospective members is mainly through its impact on institutional quality. This is not the case for FDI inflows in the candidacy regression and for net other flows in the membership regression even after controlling for the impact of the institutional quality.

4.4. Robustness checks

As a first robustness check, we consider that capital flows may exhibit a dynamic behaviour because of the market experience, investment lags, and persistence in investment decisions. The estimation results from the dynamic panel data model with fixed effects are shown in Table A7 in the online Appendix. The coefficient estimates indicate that flows in the previous year have a significantly positive impact on all types of flows.

The results for the impact of EU integration are also in line with the baseline results, i.e., a significantly positive effect for net other flows and a negative effect for portfolio investment flows. On the other hand, the interaction between EU integration and GFC dummy is significantly negative for net total flows and net other capital flows, which confirms the result of the baseline model that EU integration could not cushion the strong negative impact of the GFC on capital flows to the region.

Finally, we check whether these results are robust to excluding countries that have no communist history, i.e., Cyprus, Malta, and Turkey. The results for different types of capital flow specifications are presented in Table A8 in the online Appendix. The signs and magnitudes of the main control variables are fairly similar to those in the base model. Once again, it can be seen that the change in institutional quality and global liquidity positively affect total net flows and net other flows. As to the domestic variables, real interest rates are negatively associated with total net flows, FDI flows, and net other flows similar to the main findings. Domestic GDP growth is positively correlated with net FDI flows while the impact on the portfolio flows is negative at the 10 percent significance level. As in the main results, EU integration was not able to shield countries from the drop in total net flows and net other flows after the GFC.

5. Conclusion

New and prospective EU member countries have experienced a substantial political and economic transformation in recent decades. The EU accession process has served as an anchor for most of their transition from centrally planned to market economies. Given the importance of foreign capital as a funding source for this transformation, analysing the drivers of capital flows and the impact of EU integration is important. The literature investigating the role of EU integration on FDI inflows typically found a positive impact. However, to the best of our knowledge, there is no other empirical study that examines the impact of EU integration on different types of capital flows. This study aims to fill this gap by regressing different types of flows on EU candidacy and membership dummies along with selected control variables in the period of 1992 to 2020. In addition to the base models for which we used panel fixed effect regression models, we also performed different sensitivity analyses such as utilizing sequential g-estimation, dynamic panel data model with fixed effects, and excluding countries which do not have a communist history.

Our results can be summarized as follows. First, the Global Financial Crisis affected the impact of EU integration considerably. While we found evidence that the EU integration positively affected total net capital flows before the crisis, it was not able to shield countries from the sharp decline in capital flows after the crisis. Secondly, the impact of EU integration on capital flows mainly runs through improved domestic institutions. After including domestic institutional quality, the estimated coefficients of EU integration dummies became insignificant or less significant. Sequential g-estimation results, suggested by Acharya et al. (2016), provide only evidence for a direct positive impact of EU integration on net FDI and net other flows. Yet, the main finding that the EU integration could not prevent the regress of capital flows after the GFC remained same even after controlling the impact of institutional quality. Third, there is considerable heterogeneity among different types of flows in terms of their behaviour, their

drivers as well as the impact of EU integration. For instance, while EU integration positively affected net total flows and net other flows, it was negatively associated with portfolio investment flows. Likewise, although both global and domestic factors play a role in driving net capital flows, FDI flows were mainly driven by domestic factors such as real interest rates and GDP growth. Change in domestic institutional quality, which had a quantitatively large impact on net other flows, is found insignificant in regressions for FDI and portfolio flows. Finally, these results are robust to estimating the model in a dynamic setting and by excluding the countries that do not have a communist past.

Two main limitations of this study should be mentioned. The first one is data-related shortcomings. As most of the countries in the sample were in the Eastern Bloc until the collapse of the Soviet Union, our sample period starts from 1992. Additionally, some flows are volatile and prone to speculative movements and it may be hard to detect their drivers using annual data. These two data-related shortcomings could have reduced the explanatory power of our analysis. Secondly, although some flows may also be driven by micro-level behaviour, in view of the data used, we can only examine drivers at the macro level. Once more microeconomic data becomes available, further research may provide more insights and improve our understanding of the impact of EU integration on capital flows.

Acknowledgment

The opinions expressed are those of the authors and do not necessarily reflect the views of the authors' employing organizations. The authors would like to thank the editor for valuable comments.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Jakob de Haan  <http://orcid.org/0000-0002-5504-9448>

References

- Acharya, A., Blackwell, M., & Sen, M. (2016). Explaining causal findings without bias: Detecting and assessing direct effects. *American Political Science Review*, 110(3), 512–529.
- Ahmed, S., & Zlate, A. (2014). Capital flows to emerging market economies: A brave new world? *Journal of International Money and Finance*, 48(PB), 221–248.
- Akhtaruzzaman, M., Hajzler, C., & Owen, P. D. (2018). Does institutional quality resolve the Lucas paradox? *Applied Economics*, 50(5), 455–474.
- Alfaro, L., Kalemli-Ozcan, S., & Volosovych, V. (2008). Why doesn't capital flow from rich to poor countries? An empirical investigation. *The Review of Economics and Statistics*, 90(2), 347–368.
- Alvarez, J., & Arellano, M. (2003). The time series and cross-section asymptotics of dynamic panel data estimators. *Econometrica*, 71(4), 1121–1159.
- Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29–51.

- Baek, I. M. (2006). Portfolio investment flows to Asia and Latin America: Pull, push or market sentiment? *Journal of Asian Economics*, 17(2), 363–373.
- Bai, J., & Perron, P. (1998). Estimating and testing linear models with multiple structural changes. *Econometrica*, 66(1), 47–78.
- Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *The Quarterly Journal of Economics*, 131(4), 1593–1636.
- Baltagi, B. H. (2013). *Econometric Analysis of Panel Data* (5th ed.). Chichester: John Wiley & Sons.
- Bandelj, N. (2010). How EU integration and legacies mattered for foreign direct investment into Central and Eastern Europe. *Europe - Asia Studies*, 62(3), 481–501.
- Beckmann, J., Belke, A., & Czudaj, R. (2014). Does global liquidity drive commodity prices? *Journal of Banking and Finance*, 48, 224–234.
- Bevan, A. A., & Estrin, S. (2004). The determinants of foreign direct investment into European transition economies. *Journal of Comparative Economics*, 32(4), 775–787.
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143.
- Brafu-Insaidoo, W. G., & Biekpe, N. (2014). Determinants of foreign capital flows: The experience of selected Sub-Saharan African countries. *Journal of Applied Economics*, 17(1), 63–88.
- Bruno, R. L., Campos, N. F., & Estrin, S. (2021). The effect on foreign direct investment of membership in the European Union. *JCMS: Journal of Common Market Studies*, 131(4), 1593–1636.
- Calvo, G. A., Leiderman, L., & Reinhart, C. M. (1993). Capital inflows and real exchange rate appreciation in Latin America: The role of external factors. *Staff Papers - International Monetary Fund*, 40(1), 108–151.
- Chinn, M. D., & Ito, H. (2008). A new measure of financial openness. *Journal of Comparative Policy Analysis: Research and Practice*, 10(3), 309–322.
- Clausing, K. A., & Dorobantu, C. L. (2005). Re-entering Europe: Does European Union candidacy boost foreign direct investment? *Economics of Transition*, 13(1), 77–103.
- De Vita, G., & Kyaw, K. S. (2008). Determinants of capital flows to developing countries: A structural VAR analysis. *Journal of Economic Studies*, 35(4), 304–322.
- Dorakh, A. (2020). A gravity model analysis of FDI across EU Member States. *Journal of Economic Integration*, 35(3), 426–456.
- Dunning, J. H. (1981). *International production and the multinational enterprise*. London: Allen and Unwin.
- Fernandez-Arias, E. (1996). The new wave of private capital inflows: Push or pull? *Journal of Development Economics*, 48(2), 389–418.
- Forbes, K. J., & Warnock, F. E. (2012). Capital flow waves: Surges, stops, flight, and retrenchment. *Journal of International Economics*, 88(2), 235–251.
- Ghosh, A. R., Qureshi, M. S., Kim, J. I., & Zalduendo, J. (2014). Surges. *Journal of International Economics*, 92(2), 266–285.
- Hannan, S. A. (2017). The drivers of capital flows in emerging markets post global financial crisis. IMF Working Paper 17/52. [10.5089/9781475586121.001](https://doi.org/10.5089/9781475586121.001)
- Harkmann, K., & Staehr, K. (2021). Current account drivers and exchange rate regimes in Central and Eastern Europe. *Journal of International Money and Finance*, 110, 102286.
- Hoffmann, A. (2012). Determinants of carry trades in Central and Eastern Europe. *Applied Financial Economics*, 22(18), 1479–1490.
- Janicki, H. P., & Wunnava, P. V. (2004). Determinants of foreign direct investment: Empirical evidence from EU accession candidates. *Applied Economics*, 36(5), 505–509.
- Jimborean, R., & Kelber, A. (2017). Foreign direct investment drivers and growth in Central and Eastern Europe in the aftermath of the 2007 global financial crisis. *Comparative Economic Studies*, 59(1), 23–54.
- Jirasavetakul, L.-B. F., & Rahman, J. (2018). Foreign direct investment in new member states of the EU and Western Balkans: Taking stock and assessing prospects. IMF Working Paper 18/187.
- Kang, T. S., & Kim, K. (2019). Push vs. pull factors of capital flows revisited: A cross-country analysis. *Asian Economic Papers*, 18(1), 39–60.

- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The worldwide governance indicators: Methodology and analytical issues. *Hague Journal on the Rule of Law*, 3(2), 220–246.
- Kaya, A. I., Erden, L., & Ozkan, I. (2020). Detecting capital flow surges in developing countries. *International Journal of Finance and Economics*, 1–21. doi:[10.1002/ijfe.2335](https://doi.org/10.1002/ijfe.2335)
- Kinoshita, Y., & Campos, N. F. (2003). Why does FDI go where it goes? New Evidence from the transition economies. IMF Working Paper 03/228.
- Koepke, R. (2019). What drives capital flows to emerging markets? A survey of the empirical literature. *Journal of Economic Surveys*, 33(2), 516–540.
- Kose, M. A., Prasad, E., Rogoff, K., & Wei, S. J. (2009). Financial globalization: A reappraisal. *IMF Staff Papers*, 56(1), 8–62.
- Li, S., de Haan, J., & Scholtens, B. (2018). Surges of international fund flows. *Journal of International Money and Finance*, 82, 97–119.
- Li, S., de Haan, J., & Scholtens, B. (2019). Sudden stops of international fund flows: Occurrence and magnitude. *Review of International Economics*, 27(1), 468–497.
- Lim, J. J., & Mohapatra, S. (2016). Quantitative easing and the post-crisis surge in financial flows to developing countries. *Journal of International Money and Finance*, 68, 331–357.
- Magud, N. E., Reinhart, C. M., & Vesperoni, E. R. (2014). Capital inflows, exchange rate flexibility and credit booms. *Review of Development Economics*, 18(3), 415–430.
- Mercado, R. (2018). Bilateral capital flows: Transaction patterns and gravity. *SSRN Electronic Journal*. doi:[10.2139/ssrn.3224176](https://doi.org/10.2139/ssrn.3224176)
- Nickell, S. (1981). Biases in dynamic models with fixed effects. *Econometrica*, 49(6), 1417–1426.
- Papaioannou, E. (2009). What drives international financial flows? Politics, institutions and other determinants. *Journal of Development Economics*, 88(2), 269–281.
- Pesaran, M. H., & Smith, R. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of Econometrics*, 68(1), 79–113.
- Pesaran, M. H. (2006). Estimation and inference in large heterogeneous panels with a multifactor error structure. *Econometrica*, 74(4), 967–1012.
- Qureshi, M. S., & Sugawara, N. (2018). Surges and reversals in capital flows. *International Review of Economics and Finance*, 56(March), 92–98.
- Reinhart, C. M., & Reinhart, V. R. (2008). Capital flow bonanzas: An encompassing view of the past and present. NBER Working Paper 14321. [10.3386/w14321](https://doi.org/10.3386/w14321)
- Rey, H. (2015). Dilemma not trilemma: The global financial cycle and monetary policy Independence. NBER Working Paper 21162. [10.3386/w21162](https://doi.org/10.3386/w21162)
- Rossi, S. (2007). International capital flows within the European Monetary Union: Increasing economic divergence between the centre and the periphery. *European Journal of Economics and Economic Policies: Intervention*, 4(2), 309–329.
- Schönfelder, N., & Wagner, H. (2016). Impact of European integration on institutional development. *Journal of Economic Integration*, 31(3), 472–530.
- Yang, H., Shi, F., Wang, J., & Jing, Z. (2019). Investigating the relationship between financial liberalization and capital flow waves: A panel data analysis. *International Review of Economics and Finance*, 59, 120–136.

Appendix A.

Table A1: Average capital flows by integration status, type and before and after the GFC

Country	Integration	Net Flows / GDP (%)			FDI / GDP (%)			Portfolio / GDP (%)			Other / GDP (%)		
		Before	After	Full	Before	After	Full	Before	After	Full	Before	After	Full
Albania	Not Int.	4.3	9.1	5.4	3.6	7.9	4.6	-0.3	0.4	0.0	0.8	0.8	0.8
	Candidate	-	9.2	9.2	-	8.0	8.0	-	-0.1	-0.1	-	1.2	1.2
Bosnia & Herz.	Not Int.	9.0	6.0	7.4	4.8	2.0	3.4	0.0	-0.5	-0.4	4.2	4.5	4.3
	Not Int.	2.6	-	2.6	1.3	-	1.3	-0.7	-	-0.7	1.7	-	1.7
Bulgaria	Candidate	11.2	-	11.2	9.4	-	9.4	-1.2	-	-1.2	3.1	-	3.1
	Member	37.7	-0.5	4.9	23.0	2.7	5.6	-2.0	-1.1	-1.2	16.6	-2.2	0.5
Croatia	Not Int.	9.7	-	9.7	3.0	-	3.0	1.6	-	1.6	5.1	-	5.1
	Candidate	12.1	3.8	8.0	5.5	2.3	3.9	-1.2	1.8	0.3	7.8	-0.3	3.7
Cyprus	Member	-	-0.5	-0.5	-	2.4	2.4	-0.4	-0.4	-0.4	-	-2.6	-2.6
	Not Int.	2.2	-	2.2	2.2	-	2.2	-0.5	-	-0.5	0.6	-	0.6
Czechia	Candidate	4.3	-	4.3	4.9	-	4.9	-0.6	-	-0.6	0.1	-	0.1
	Member	9.6	3.9	5.6	1.5	-11.4	-7.6	-11.9	13.6	6.1	20.1	1.7	7.1
Czechia	Not Int.	7.2	-	7.2	2.2	-	2.2	2.1	-	2.1	2.9	-	2.9
	Candidate	6.8	-	6.8	7.2	-	7.2	-0.8	-	-0.8	0.5	-	0.5
Estonia	Member	3.5	3.8	3.7	4.0	1.4	2.2	-0.6	2.1	1.3	0.1	0.3	0.3
	Not Int.	10.7	-	10.7	3.1	-	3.1	2.5	-	2.5	5.1	-	5.1
Hungary	Candidate	8.3	-	8.3	5.8	-	5.8	0.9	-	0.9	1.6	-	1.6
	Member	13.7	-3.2	1.8	5.8	4.2	4.7	-3.3	-4.3	-4.0	11.2	-3.2	1.1
Hungary	Not Int.	5.8	-	5.8	6.2	-	6.2	3.4	-	3.4	-3.2	-	-3.2
	Candidate	7.8	-	7.8	4.5	-	4.5	2.6	-	2.6	0.7	-	0.7
Kosovo	Member	11.5	-1.3	2.5	2.5	1.7	1.9	2.5	-0.6	0.3	6.6	-2.4	0.2
	Not Int.	13.5	5.2	5.9	9.7	4.8	5.1	0.5	-1.4	-1.2	3.3	1.8	1.9
Latvia	Not Int.	8.1	-	8.1	6.1	-	6.1	-3.9	-	-3.9	5.8	-	5.8
	Candidate	7.3	-	7.3	3.0	-	3.0	-0.3	-	-0.3	4.6	-	4.6
Lithuania	Member	18.6	-2.3	3.9	4.6	2.1	2.8	0.0	-2.6	-1.8	14.0	-1.8	2.9
	Not Int.	8.5	-	8.5	2.0	-	2.0	0.9	-	0.9	5.6	-	5.6
Lithuania	Candidate	8.3	-	8.3	4.2	-	4.2	1.7	-	1.7	2.4	-	2.4
	Member	11.1	-2.0	1.9	3.6	1.0	1.8	-0.3	0.6	0.3	7.8	-3.6	-0.2

(Continued)



Table A1: (Continued).

Malta	Not Int.	6.5	-	6.5	5.6	-	5.6	-4.0	-	-4.0	5.0	-	5.0
	Candidate	4.8	-	4.8	4.7	-	4.7	-16.9	-	-16.9	16.9	-	16.9
	Member	4.7	-3.3	-0.9	120.8	87.1	97.0	-129.1	-83.1	-96.6	13.0	-7.2	-1.3
Montenegro	Not Int.	47.0	22.7	34.8	20.1	26.9	23.5	-0.4	2.3	1.0	27.3	-6.6	10.4
	Candidate	-	17.5	17.5	-	10.8	10.8	-	3.2	3.2	-	3.6	3.6
North Macedonia	Not Int.	7.0	-	7.0	3.7	-	3.7	0.4	-	0.4	2.9	-	2.9
	Candidate	9.1	4.0	5.0	6.9	2.8	3.6	0.8	1.1	1.1	1.4	0.2	0.4
Poland	Not Int.	2.0	-	2.0	2.1	-	2.1	0.4	-	0.4	-0.4	-	-0.4
	Candidate	4.8	-	4.8	3.4	-	3.4	1.0	-	1.0	0.5	-	0.5
	Member	5.6	3.0	3.8	3.2	1.8	2.2	1.0	1.1	1.1	1.5	0.0	0.5
Romania	Not Int.	4.4	-	4.4	1.8	-	1.8	0.6	-	0.6	2.0	-	2.0
	Candidate	10.4	-	10.4	4.9	-	4.9	0.5	-	0.5	5.0	-	5.0
	Member	14.5	1.7	3.5	5.8	2.1	2.6	0.1	1.8	1.6	8.6	-2.2	-0.7
Serbia	Not Int.	16.9	10.4	13.0	7.6	6.5	6.9	0.9	1.6	1.3	8.4	2.4	4.8
	Candidate	-	4.9	4.9	-	5.2	5.2	-	0.8	0.8	-	-1.2	-1.2
Slovakia	Not Int.	3.6	-	3.6	0.9	-	0.9	0.1	-	0.1	2.6	-	2.6
	Candidate	6.7	-	6.7	4.8	-	4.8	1.2	-	1.2	0.8	-	0.8
	Member	7.7	2.2	3.8	5.4	0.8	2.2	-0.6	0.5	0.2	2.8	0.9	1.5
Slovenia	Not Int.	3.5	-	3.5	1.0	-	1.0	1.3	-	1.3	1.1	-	1.1
	Candidate	3.9	-	3.9	1.5	-	1.5	0.4	-	0.4	2.0	-	2.0
	Member	3.6	-2.8	-0.9	-0.2	1.1	0.7	-3.5	1.4	0.0	7.5	-5.3	-1.5
Turkey	Not Int.	2.0	-	2.0	0.3	-	0.3	0.6	-	0.6	1.0	-	1.0
	Candidate	4.1	3.6	3.8	1.5	1.1	1.2	0.5	1.2	0.9	2.2	1.3	1.7
	Not Int.	6.5	7.5	6.8	3.5	5.7***	4.0	0.2	-0.3	0.1	2.9	2.2	2.7
TOTAL	Candidate	7.3	7.2	7.3	4.8	4.9	4.8	-0.4	1.4***	0.3	2.9	0.9**	2.2
	Member	10.2	-0.1***	2.6	15.1	7.6	9.6	-13.6	-5.6	-7.7	8.8	-2.1***	0.7
	Full Sample	7.5	2.6***	5.2	6.3	6.7	6.5	-3.0	-3.3	-3.1	4.1	-0.8***	1.8

Note: ** and *** show that the difference between mean flows before and after the GFC is statistically significant at 95 and 99 percent level. Due to lack of sufficient data, the mean difference test is only performed for total sample.

Table A2: Description and Sources of Variables

Variable	Description	Source
Net Capital Flows	Capital and financial account excluding reserves, % of GDP	IMF - BOP Database
Foreign Direct Investment	Foreign Direct Investment, % of GDP	IMF - BOP Database
Portfolio Investment	Portfolio Investment, % of GDP	IMF - BOP Database
Other Investments	Financial derivatives and other credit flows, % of GDP	IMF - BOP Database
US Real Interest Rates	10-Year Treasury Constant Maturity Rate (%), deflated by inflation.	Fed. Res. Bank of St. Louis
Global Liquidity	The GDP-weighted sum of reference monetary aggregates as a percent to GDP for the US, Euro Area, Japan, and the UK.	IMF - WEO Database Central Banks of relevant countries
GDP Growth	y-o-y changes in constant price GDP (%)	IMF - WEO Database
Domestic Real Interest Rates	Deposit interest rates for most of the countries. For Estonia, Latvia, Lithuania, and Malta harmonized Euro Area interest rates, for Cyprus, Slovakia, and Slovenia benchmark government bond yields, and for Poland monetary policy interest rates are used. (%) All data are deflated by inflation.	IMF - IFSIMF - WEO Database
Institutional Quality	The composite index measuring institutional quality based on six dimensions of governance. The overall index is constructed by factor analysis. As it is only available on a two-year basis until 2002, we take the average of respective two years to fill missing years.	Worldwide Governance Indicators
Trade Openness	The sum of exports and imports of goods and services as a percent of GDP (%)	The World Bank - World Development Indicators
Financial Development Index	The index measures the level of development of financial institutions and markets across countries in terms of access, depth, and efficiency on a scale of 0 to 1.	IMF - Financial Development Index
Financial Openness	The index measures de jure financial openness in four dimensions: i) capital account openness, ii) current account openness, iii) the stringency of requirements for the repatriation and/or surrender of export proceeds, and iv) the existence of multiple exchange rates for capital account transactions. In a scale of 0 to 1, higher values indicate more open financial systems.	Chinn and Ito (2008)

Table A3: Results of the Factor Analysis for Institutional Quality

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor 1	5.161	4.940	0.972	0.972
Factor 2	0.221	0.192	0.042	1.014
Factor 3	0.029	0.045	0.006	1.020
Factor 4	-0.016	0.008	-0.003	1.017
Factor 5	-0.024	0.042	-0.004	1.012
Factor 6	-0.065	.	-0.012	1.000

LR Test Chi-squared: 4,480***

Bartlett Chi-squared: 4,470***

KMO Measure: 0.873

* p<0.10, ** p<0.05, *** p<0.01

Table A4: Factor Loadings and Unique Variances

<i>Variable</i>	<i>Factor 1</i>	<i>Uniqueness</i>
Control of Corruption	0.969	0.062
Government Effectiveness	0.946	0.105
Political Stability	0.933	0.130
Regulatory Quality	0.942	0.112
Rule of Law	0.839	0.297
Voice and Accountability	0.930	0.134

Table A5: Correlation Matrix of Explanatory Variables

	US Real Interest Rates (%)	Global Liquidity (% of GDP)	GDP Growth (%)	Dom. Real Interest Rates (%)	Institutional Quality	Candidacy Dummy	Membership Dummy	Post-GFC Dummy
US Real Interest Rates (%)	1.000							
Global Liquidity (% of GDP)	-0.718	1.000						
GDP Growth (%)	0.069	-0.282	1.000					
Dom. Real Interest Rates (%)	-0.069	0.055	0.194	1.000				
Institutional Quality	-0.075	0.083	-0.090	-0.171	1.000			
Candidacy Dummy	-0.509	0.339	-0.095	0.078	0.546	1.000		
Membership Dummy	-0.488	0.511	-0.107	0.036	0.584	0.575	1.000	
Post-GFC Dummy	-0.611	0.849	-0.256	0.075	0.062	0.386	0.460	1.000

Table A6: Results of VIF Analysis

Variables	Candidacy		Membership	
	VIF	1/VIF	VIF	1/VIF
GFC dummy	9.58	0.104	4.79	0.209
EU Integration dummy	3.37	0.297	4.01	0.249
EU Int. x GFC	10.17	0.098	6.25	0.160
Inst. Quality (Lag, diff.)	1.78	0.563	2.00	0.499
US 10 YR Real Int.	1.44	0.696	1.44	0.696
Global Liq. (diff.)	1.66	0.602	1.66	0.603
Real Interest Rates	1.46	0.683	1.52	0.660
GDP Growth	1.14	0.874	1.15	0.871
Mean VIF	2.71		2.40	

Note: VIF values for individual fixed effects are not shown in the table.

Table A7: Dynamic Panel Data Model Estimation Results

	Candidacy				Membership			
	CF/GDP	FDI/GDP	Portfolio / GDP	Other/GDP	CF/GDP	FDI/GDP	Portfolio / GDP	Other/GDP
Lag of Dependent	0.493*** (0.038)	0.397*** (0.120)	0.254*** (0.072)	0.216*** (0.017)	0.470*** (0.036)	0.411*** (0.112)	0.244*** (0.072)	0.203*** (0.019)
Post-GFC Dummy	-1.625 (1.311)	0.877 (1.583)	0.259 (0.465)	-3.405 (2.079)	-1.258 (0.947)	-0.504 (0.752)	0.448 (0.284)	-2.081 (1.243)
EU Int. Dummy	1.592 (1.053)	0.690 (0.771)	0.285 (0.550)	2.681** (1.069)	1.091 (0.765)	-0.043 (0.461)	-1.018** (0.440)	4.422* (2.449)
EU Int. x GFC	-2.422* (1.286)	-2.317 (1.679)	-0.417 (0.623)	-2.970 (2.259)	-3.974*** (1.372)	-0.798 (0.866)	-0.297 (0.564)	-7.167*** (2.197)
Instit. Quality (Lag, diff.)	0.781 (1.944)	-1.228 (1.373)	-0.991 (1.775)	5.593 (3.501)	1.273 (1.833)	-0.998 (1.502)	-0.847 (1.735)	6.031* (3.323)
US 10 YR Real Int.	-0.332 (0.251)	0.102 (0.116)	0.018 (0.125)	-0.809 (0.597)	-0.292 (0.277)	0.105 (0.181)	-0.100 (0.134)	-0.471 (0.801)
Global Liq. (diff.)	0.112** (0.040)	0.010 (0.031)	-0.001 (0.035)	0.101* (0.054)	0.114** (0.041)	0.009 (0.033)	0.000 (0.034)	0.096* (0.052)
Real Interest Rates	-0.058 (0.044)	-0.033 (0.022)	0.004 (0.040)	-0.047 (0.066)	-0.041 (0.038)	-0.038 (0.030)	0.029 (0.041)	-0.044 (0.076)
GDP Growth	0.226** (0.096)	0.076 (0.049)	-0.041 (0.060)	0.058 (0.150)	0.221** (0.089)	0.072 (0.054)	-0.039 (0.055)	0.053 (0.136)
Observations	427	381	372	427	427	381	372	427
R-squared	0.567	0.313	0.065	0.111	0.576	0.302	0.074	0.122

Notes: 1) EU Integration dummy implies the candidacy status for the first 4 columns and the membership status for others. 2) Country-specific fixed effects included in all models. 3) Cyprus and Malta are excluded from the net FDI and portfolio inflow regressions due to outliers. 4) Standard errors in parentheses are clustered by countries. * p<0.10, ** p<0.05, *** p<0.01

Table A8: Estimation Results for the Former Eastern Bloc countries

	Candidacy				Membership			
	CF/GDP	FDI/GDP	Portfolio / GDP	Other/GDP	CF/GDP	FDI/GDP	Portfolio / GDP	Other/GDP
Post-GFC Dummy	-1.912 (2.275)	1.288 (2.461)	-0.417 (0.543)	-2.716 (2.033)	-2.958 (2.149)	-0.604 (1.493)	-0.075 (0.360)	-2.219* (1.244)
EU Int. Dummy	3.459 (2.337)	1.169 (1.579)	0.321 (0.790)	2.000 (1.200)	3.297* (1.878)	0.073 (0.802)	-1.204* (0.625)	4.388** (1.603)
EU Int. x GFC	-6.451** (2.440)	-3.701 (2.599)	-0.229 (0.799)	-2.631 (2.244)	-7.170** (3.185)	-1.598 (1.869)	-0.100 (0.769)	-5.583** (2.189)
Institutional Quality (Lag, diff.)	5.545* (2.832)	-0.564 (1.617)	0.238 (1.783)	5.995** (2.479)	5.692* (2.711)	-0.490 (1.813)	0.279 (1.776)	5.984** (2.404)
US 10 YR Real Int.	-0.280 (0.286)	0.115 (0.143)	-0.055 (0.156)	-0.360 (0.336)	0.008 (0.318)	0.157 (0.246)	-0.197 (0.170)	0.017 (0.399)
Global Liq. (diff.)	0.184** (0.063)	0.040 (0.037)	-0.041 (0.031)	0.181** (0.070)	0.185** (0.064)	0.045 (0.039)	-0.037 (0.030)	0.174** (0.066)
Real Interest Rates	-0.161*** (0.034)	-0.043** (0.016)	0.011 (0.067)	-0.136*** (0.025)	-0.182*** (0.031)	-0.058*** (0.018)	0.041 (0.068)	-0.155*** (0.023)
GDP Growth	0.141 (0.127)	0.104* (0.056)	-0.125* (0.068)	0.157 (0.111)	0.145 (0.121)	0.108* (0.057)	-0.115* (0.065)	0.148 (0.104)
Observations	360	360	352	360	360	360	352	360
R-squared	0.439	0.185	0.013	0.273	0.456	0.159	0.023	0.313

Notes: 1) EU integration dummy implies the candidacy status for the first 4 columns and the membership status afterwards. 2) Country-specific fixed effects included in all models. 3) In line with the Modified Wald test for heteroscedasticity results, standard errors are clustered by countries. 4) Standard errors in parentheses are clustered by countries. * p<0.10, ** p<0.05, *** p<0.01