Abnormal FDI as a driver of sudden stop episodes*

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Abstract

In this paper we study role of abnormal FDI as a potential driver of sudden stop episodes during 2009-2019 period in sample of developed and developing countries. Volume of abnormal FDI is derived from unexplained part of country fixed effects in bilateral gravity regression. We construct three measures 'FDI abnormality' that i) approximate role of an economy as financial center or tax haven, ii) calculate contribution of 'FDI abnormality' to total FDI position, iii) adjust value of FDI stock given their exposure towards territories considered as tax havens or financial centers. Using these measures we estimate panel probit model and obtain three important results. We find that economies with comparably higher share of inward 'abnormal FDI' were associated with lower incidence of sudden stop episodes; that capital flows linked to tax haven or financial centers territories may increase likelihood of sudden stop in certain instances; and retrenchment episodes driven by behaviour of domestic investors are not sensitive to any measure of 'FDI abnormality'.

Keywords: sudden stop, FDI, illicit financial flows

JEL Codes:

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1 Introduction

Over the last four decades, the increasing capital mobility has expanded the size of international capital flows tremendously. However, large volume of global capital mobility implies higher level of vulnerability and potential contagious effects, when the global financial system encounters some exogenous shocks (Cardarelli et al., 2010; Calderón and Kubota, 2013). In this regard, capital flow reversals driven by uncertainty and business-cycle downturn have inflicted significant damage to the economic performance of numerous countries in the past decades. Understanding the behavior and fundamental determinants of such abrupt reverse in financial inflows, also referred as sudden stops, have sparked academic research and policy debates and continuous empirical explorations (Calvo, 1998). A growing body of literature has made valuable contribution both in terms of refining the theoretical framework of the concept as well as estimating their size, costs, and determinants (Calvo, 1998; Calvo et al., 2004; Guidotti et al., 2004; Edwards, 2004, 2007; Forbes and Warnock, 2012, 2021; Rothenberg and Warnock, 2011; Mendoza, 2010; D.Bordo et al., 2010; Agosin and Huaita, 2012; Agosin et al., 2019).

Sudden stops are generally considered as a policy concern because they often emerge unexpectedly and against the "will" of domestic policy makers. Therefore, as Edwards (2004) describes them, a sudden stop in capital flows is "an abrupt and major reduction in capital inflows to a country that has been receiving large volumes of foreign capital". In this regard, sudden stops do not reflect on a classical portfolio adjustment by economic agents, rather a form of financial "decoupling" with multifaceted adverse macroeconomic ramifications. Various studies point out that sudden stops can put downward pressure on the exchange rate (Calvo, 1998; Calvo and Reinhart, 2000; Forbes and Warnock, 2012; Eichengreen and Gupta, 2016), trigger currency and banking crises (de Mello et al., 2012; Calderón and Kubota, 2013), and lead to substantial output loss (Calvo et al., 2006; Edwards, 2007). Other studies show that sudden stops are highly correlated with real estate boom, debt defaults and inflation (Aizenman et al., 2010), with slower economic growth and higher interest rates (Edwards, 2007; Freund and Warnock, 2007).

Among the various determinants of sudden stop episodes, one strand of literature investigates their materialization in light of variation in the composition of countries' foreign liabilities, such as FDI, portfolio investment and external debt. It is generally believed that foreign direct investment is predominantly a long-term investment and as such it is less prone to short-term speculative financial swings (Eichengreen et al., 2008; Cardarelli et al., 2010; Sula and Willett, 2011; Hattari and Rajan, 2011), contrary to higher volatility of portfolio flows Forbes and Warnock (2021). According to Levchenko and Mauro (2006), FDI has the least contribution to sudden stops episodes, while other flows, such as bank loans and trade credit, play a critical role in triggering sudden stops episodes.

Nevertheless, the extreme financialization of world economy has not left the (long-term believed) stable nature of the FDI unscathed. Few recent studies warn of the gray area associated with FDI financial flows. Ndikumana and Sarr (2019) show that non-negligible part of foreign direct investment is associated with capital flight. Similarly, Perez et al. (2012) by examining the data of emerging economies conclude that FDI serves as a vehicle to facilitate illicit financial flows. Their findings seem to suggest that a significant level ($6 - 10\%$) of total FDI outflows, and over 20% of FDI to money-laundering countries from the sample, was to facilitate illicit money flows. Delatte et al. (2022) ventures even further by estimating that abnormal FDI in tax havens represent 36% of global predicted FDI. Damgaard et al. (2019) indirectly confirms this

finding by estimating that phantom investment into corporate shells with no substance and no real links to the local economy may account for almost 40% of global FDI.

Reflecting on the rising role of 'phantom' (Damgaard et al., 2019) or 'abnormal' (Delatte et al., 2022) FDI in international monetary system, this study examines the determinants of sudden stops episodes during period 2009-2019 focusing the contribution of abnormal FDI to likelihood of crisis incidence. Given the above-mentioned adverse consequences of capital flow reversals, our study can therefore provide an interesting piece of puzzle by answering the question whether the new, potentially 'speculative', nature of FDI can still deliver on the promise of its stabilization properties. Methodologically, we depart from Delatte et al. (2022) and use gravity panel models in order to build three measures of 'FDI abnormality' that i) approximate role of an economy as financial center or tax haven, ii) indicate contribution of 'FDI abnormality' on total FDI position, iii) adjust value of FDI stock given their exposure towards territories considered as tax havens or financial centers.

Our findings suggest that economies with comparably higher share of inward 'abnormal FDI' were associated with lower incidence of sudden stop episodes; that capital flows linked to tax haven or financial centers territories may increase likelihood of sudden stop in certain instances; and retrenchment episodes driven by behaviour of domestic investors are not sensitive to any measure of 'FDI abnormality'.

The remainder of the paper is organized as follows. Section 2 outlines the relevant literature, Section 3 describes the empirical methodology and introduces our data. The results are reported in Section 4, and Section 5 concludes the paper.

2 Literature Review

Literature investigating determinants of sudden stop episodes usually focuses on size of financial system and financial market integration (Forbes and Warnock, 2012), exchange rate regime Agosin and Huaita (2012), fiscal space and fiscal discipline (Cardarelli et al., 2010; Hutchison et al., 2010) or trade openness (Cavallo and Frankel, 2008; D.Bordo et al., 2010). The diminishing role of global and regional factors in explaining extreme movement of capital flows across countries and the rising role of domestic factors, such as such as economic growth or private debt accumulation has been also recently reported (Forbes and Warnock, 2021; Emter, 2020).

With relatively equal probability of experiencing sudden stop episodes in developed and developing countries (Agosin et al., 2019), real economic impact of such events is reported to be lower in developed countries (Fabiani et al., 2021) and can be magnified by higher capital mobility (Edwards, 2007).

Regarding the role of FDI-related capital inflows and outflows, several contribution has been so far published. Levchenko and Mauro (2006) broadly discuss the key mechanisms how some foreign liabilities can exert additional pressure on countries' financial vulnerability while others, such as FDI, could help to alleviate potential shocks. In their most recent study, Forbes and Warnock (2021) examine the implications of cross-border portfolio and debt flows on episodes of sudden stops, and conclude that portfolio flows are more volatile compared to debt flows and that the contribution of portfolio flows to episodes of both surge and stops has increased mainly since the outbreak of the Global Financial Crisis. They conclude that foreign direct investment is more stable and is less likely to trigger sudden stops. It is generally believed that, foreign direct investment is predominantly a long-term investment and is less prone to short-term speculative

financial swings (Sula and Willett, 2011; Cardarelli et al., 2010; Hattari and Rajan, 2011). Estimating the likelihood of sudden stops, albeit based on net capital flows, other studies conclude that FDI has the least contribution to sudden stops episodes, while other flows (bank loans and trade credit) play a critical role in triggering sudden stops episodes (Levchenko and Mauro, 2006).

However, as rightly argued in Sula and Willett (2011), while the physical infrastructure part of FDI is less likely to be reversed during financial crisis, "the flow of funds" can change its courses. This corroborates previous theoretical underpinnings regarding the "tricky" nature of FDI. Previous studies, such as Bank (2000), for instance, show the peculiarity and lack of clarity of financial flows that are associated with FDI. As argued, there are several channels through which FDI, if not trigger directly, can certainly contribute to increasing the likelihood of financial vulnerability to the host economy. First, investors, while keeping their physical asset intact, can nonetheless worsen the financial vulnerability of a host economy by moving their profit remittances, which are not officially categorized as FDI, out of the host economy or reducing the liabilities of their affiliates towards mother companies (Bank, 2000; Sula and Willett, 2011). This seems to suggest that FDI can elevate financial vulnerability by disguising other types of flows. As emphasized by Bank (2000) and broadly discussed in Sula and Willett (2011), flows can be recorded in receiving country as FDI but exit the country under different accounts. Furthermore, if FDI has been financed from the host country's banking system, for instance using its collateral to secure banks loans, it can eventually create outflows recorded as portfolio or bank lending and accelerates the financial vulnerability of the host economy (Bird and Rajan, 2002).

3 Methodology

3.1 Sudden stop episodes

We follow Agosin et al. (2019) and examine separately the behaviour of foreign assets and liabilities, in which we focus on the episodes of substantial decrease in capital inflows by foreign investors.[1]

On the foreign liabilities side, capital inflows are recorded as positive net incurrence of foreign liabilities. As a consequence, years with an excessive decrease in net foreign liabilities position will be labeled as a sudden stop episode.

As argued in Forbes and Warnock (2012), when a decline in the financial account occurs, it is not clear whether it was triggered by foreign investors, who decided to abruptly withhold their investments or by domestic investors, who made a sudden increase in demand for foreign assets (Calderón and Kubota, 2013; Agosin et al., 2019; Febrero et al., 2019; Emter, 2020). Additionally, sudden short-term fallout of foreign financing may be counteracted by outflow retrenchment observed at foreign assets side. The subsequent repatriation of capital held abroad by residents can therefore mitigate the impact of sudden stop episodes at liability sides in a such a way, that the sudden stops measured at the overall financial account level may even not be registered. Given this reasoning, we also identify episodes of excessive movement on the foreign

[1]Most studies in the pre-Global Financial Crisis period followed the net capital flows approach. In one of the first empirical studies, Calvo et al. (2004) and later Guidotti et al. (2004) estimated sudden stop episodes based on annual change in capital flows and sudden stops episode occurred when these net flows fall one standard deviation below the mean. Numerous other studies followed the same approach in estimating sudden stops D.Bordo et al. (2010); Rothenberg and Warnock (2011); Cowan and Raddatz (2013); Zhao et al. (2014). More recent literature prefers estimating the sudden stops on individual elements of financial account balance, e.g. Agosin et al. (2019). Cavallo et al. (2015) even propose a new taxonomy of sudden stops and broadly discuss the seven possible results a country can potentially encounter.

assets side. Years with excessive decrease in net foreign assets position will be labeled as a retrenchment episodes, similar to Forbes and Warnock (2012, 2021).

Sudden stop episodes are therefore identified as years in which the annual decline in the stock of foreign liabilities is at least one standard deviation larger than its average and, at the same time, this decline is larger than 5 percent of GDP (Edwards, 2004, 2007; Agosin et al., 2019). Mathematically, the following condition must be satisfied:

$$FLSS_{it} = \begin{cases} 1 & \text{if } \triangle FL_{it} < \overline{\triangle FL}_i - \sigma_{\triangle FL_i},\ \frac{\triangle FL_{it}}{GDP_{it}} < -5\%, \\ 0 & \text{otherwise.} \end{cases} \tag{1}$$

where $\triangle FL_{it} = FL_{it} - FL_{it-1}$ is the annual absolute change in net incurrence of foreign liabilities, and $\sigma_{\triangle FL_i}$ standard deviation of annual absolute changes in net incurrence of foreign liabilities.

Retrenchment episodes are identified as years in which the annual decline in the stock of foreign assets is at least one standard deviation larger than its average and, at the same time, this decline is larger than 5 percent of GDP. Mathematically, the following condition must be satisfied::

$$FASS_{it} = \begin{cases} 1 & \text{if } \triangle FA_{it} < \overline{\triangle FA}_i - \sigma_{\triangle FA_i},\ \frac{\triangle FA_{it}}{GDP_{it}} < -5\%, \\ 0 & \text{otherwise.} \end{cases} \tag{2}$$

where $\triangle FA_{it} = FA_{it} - FA_{it-1}$ is the annual absolute change in net acquisition of foreign assets, and $\sigma_{\triangle FL_i}$ standard deviation of annual absolute changes in net acquisition of foreign assets.

The excessiveness of capital flows is measured by its ratio over nominal GDP, as in [1] and [2]. In line with Agosin et al. (2019), we use quadratic trend of actual GDP for GDP_{it}.

Table 1: Number of sudden stop (Liabilities) and sudden stop reversals (Assets) episodes in the period 2010–2019

Panel A - Full sample (65 countries)				
		Sudden stop reversals (Assets)		
		Crisis	No crisis	Total
Sudden stops (Liabilities)	Crisis	72	33	105
	No crisis	17	478	495
	Total	89	511	600
Panel B - Balanced sample (49 countries)				
		Sudden stop reversals (Assets)		
		Crisis	No crisis	Total
Sudden stops (Liabilities)	Crisis	55	28	83
	No crisis	15	392	407
	Total	70	420	490

By calculating the crisis event periods according to [1] and [2], we identify 105 episodes of liabilities-related dry-out of capital inflows (18% of the observations in the sample), where 72 (69%) took place in coordination with and 33 (31%) without associated retrenchment events (assets side). On the assets side, we identify 89 episodes of excessive foreign assets sell-outs (15% of the observations in the sample), where

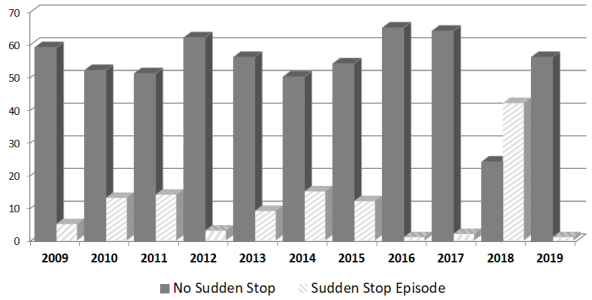

Figure 1: Sudden stop episodes - Foreign liabilities

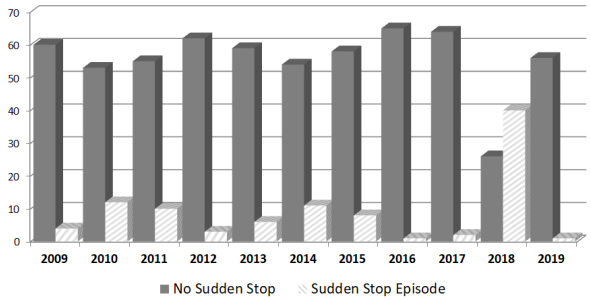

Figure 2: Retrenchment episodes - Foreign assets

72 (81%) took place in coordination and 17 (19%) without associated retrenchment events (assets side). As apparent, almost 2/3 or sudden stop episodes happen simultaneously on both, assets and liabilities sides, indirectly hinting towards presence of assets repatriation behaviour of domestic residents. On the other hand, roughly one third of crisis episodes remain still mutually uncorrelated. Similar pattern is observed also in balanced sample of 49 economies where again two third of sudden stop episodes occur in presence of excessive foreign asset contraction. [2]

When one looks at a graphic presentation of distribution of sudden stop episodes, one finds the clear correlation between number of sudden stop episodes (Table 1) and retrenchment events (Table 2) across time. In both cases we observe two small peaks in distribution of crisis events, first around year 2011 and second around year 2014, and one major occurrence of sudden stops in year 2018. Similar pattern was reported in Forbes and Warnock (2012) and Forbes and Warnock (2021) who describe post-GVC sudden stop pattern more as "ripples" rather than "waves". While the Great Recession crisis exhibited unusually large episodes of sudden stops and retrenchment mainly due to "investors' liquidation" of foreign investment positions and subsequently bringing the proceeds to their countries of origin, the peak in 2014 followed by retrenchment in 2015 is interpreted to be associated with a response to the rise of the Federal Funds rates in the United States.

3.2 Gravity regression and 'abnormal FDI'

For analyzing abnormal foreign direct flows (FDI), we adopt two stages gravity procedure used by Delatte et al. (2022), initially developed by Head and Ries (2008), that is based on the gravity framework of bilateral FDI flow. We assess the country-specific unexplained part of investment stock as a measure of speculative bilateral investments (Delatte et al. (2022)). Originally, gravity models were developed to analyze bilateral trade of goods among particular countries (Tinbergen, 1962; Anderson, 1979; Bergstrand, 1985; Anderson and van Wincoop, 2003). Later on, gravity models were extended to capture various areas of research where interactions between two or more places were analyzed (migration, tourism, financial flows, etc.). Explanation of bilateral financial transactions through the gravity framework is currently well-documented

[2] Agosin et al. (2019) argue that the possibility to repatriate foreign assets as a response to sudden dry-out of foreign capital is predominantly an option offered to advanced economies. We observe this phenomenon also in our sample. In Table A2 we report the distribution of crisis events per developed and advanced economies groups. While in case of developing countries, approximately half of the instances of sudden stop episodes are associated with retrenchment events on foreign assets sides, in advanced economies this proportion raises to 80% in both, full sample as well as balanced panel.

in several studies (Martin and Rey, 2004; Head and Ries, 2008; Head and Mayer, 2014; Brei and von Peter, 2018; Delatte et al., 2022).

This approach allows us to differentiate between FDI determined by economic, historical, cultural and geographical factors and between FDI generated by more speculative activity driven by country-specific determinants such as low taxation and low environment transparency. In the first step, investment stock is assessed on the time-varying fixed effects of origin and destination country and on a vector of bilateral factors:[3]

$$lnFDI_{ijt} = \lambda_{it} + \lambda_{jt} + \beta X_{ijt} + \delta Z_{ij} + \epsilon_{ijt} \tag{3}$$

where $lnFDI_{ijt}$ represents the log of bilateral FDI stock, λ_{it} and λ_{jt} are country-specific time-varying fixed effects of the origin and destination country, vectors X_{ijt} and δZ_{ij} represent a set of regressors covering mainly geographical, cultural and historical factors, as suggested by Delatte et al. (2022), that are either time-invariant or are of a slow-moving nature: log of bilateral distance, common language, common borders, common currency, the existence of a colonial relationship, tax treaty, regional trade agreement and EU membership, ϵ_{ijt} is a bilateral error term. Following the recommendation by Yotov et al. (2016), we use exporter-time and importer-time fixed effects to properly account for multilateral resistance terms in panel data gravity estimations.

In the second step, we focus on the estimates of country-specific investment stock associated with speculative motives as it is used in Delatte et al. (2022). We regress time-varying country-specific fixed effects of origin and destination country λ_{it}, λ_{jt} estimated in the first stage on the country-specific characteristics. This approach allows us to assess country-specific residuals ϵ_{it} and ϵ_{jt} related to the speculative part of FDI. The second step equations are as follows:

$$\lambda_{it} = \alpha_1 Z_{it} + \alpha_2 \overline{\mathrm{X}}_{it} + u_{it} \tag{4}$$

$$\lambda_{jt} = \alpha_1 Z_{jt} + \alpha_2 \overline{\mathrm{X}}_{jt} + u_{jt} \tag{5}$$

where Z_{it}, Z_{jt} are country-time varying covariates: log of current GDP, log of population, the rule of law, corporate tax rate, political stability and absence of violence, regulatory quality, control of corruption, voice and accountability, days required to start a business and number of procedures to start a business; and are error terms related to measuring of speculative investments; $\overline{\mathrm{X}}_{it}$ and $\overline{\mathrm{X}}_{jt}$ represents averages of bilateral characteristics of countries i and j included in $\mathrm{X_{ijt}}$ calculated as follows:

$$\overline{\mathrm{X}}_{it} = \sum_{j=1} \overline{\mathrm{X}}_{ijt} / N_j. \tag{6}$$

We do not use lagged values of most of the variables, as they are either time-invariant (e.g. gravity variables), or are slow-moving due to their nature (e.g., world governance indicators), similar to Mercado (2020).

[3]For OLS model we used reghdfe package by Correia (2014)

3.3 Derived measures of 'FDI abnormality'

We calculate several measures linked to the extent of possible 'phantom' FDIs derived from equations [4] and [5]. Our methodology takes advantage of model by Delatte et al. (2022) who link FDI residuals, among others, from gravity type of regressions to international investments that follow an economically 'abnormal' pattern. These capital flows are endemic to current financial landscape that is extensively populated by financial centers and tax haven economies.

Firstly, the residuals of reporter and partner fixed effects derived from the equations [4] and [5] are used to approximate relative position of a country with respect to its possible role as a financial center or a tax haven economy.

$$rankw_{i(j)t} = \frac{u_{i(j)t}}{\sum_{i(j)=1}^{I(J)} u_{i(j)t}} \tag{7}$$

Measure of relative position $rankw_{it}$ ranks a country i according to value of its unexplained, or 'abnormal', FDI asset positions. Such a measure indirectly captures average tendency of an economy to export abnormal capital to its partners. On the other side, measure of relative position $rankw_{jt}$ ranks a country j according to value of its unexplained, or 'abnormal', FDI liabilities positions. Such a measure can be viewed in terms of average tendency of an economy to become a target of abnormal capital deposited by its partners.

There is no a priory expectation whether a financial center country should score higher in outward w_{it} or inward w_{jt} ranking. Empirically, many of the financial centers serve a double role; being both the target as well as the source of international capital flows.

Secondly, the residuals of reporter and partner fixed effects from the equations [4] and [5] allow us to calculate the relative importance of abnormal FDI on total reported stock of FDI by a particular economy.

$$ranks_{i(j)t} = \frac{N^{j(i)} u_{i(j)t}}{\sum_{j(i)=1}^{J(I)} FDI_{ijt}}, if FDI_{ijt} > 0 \tag{8}$$

Higher share of abnormal assets on total assets, $ranks_{it}$, may indicate higher proclivity towards export of capital to economies characterized as tax haven or financial centers. On the other side, higher share of abnormal liabilities on total reported liabilities, $ranks_{jt}$, could be associated with tax haven or financial center role an economy that now enters global stage on a receiving side of capital.

In a similar vein, we calculate the adjusted value of FDI stocks that takes into account international exposure of a domestic economy towards capital flows flowing into or from financial centers and tax haven economies. In order to do so, we weight bilateral FDI stocks by measure of relative ranking of countries, $rankw_{i(j)t}$, derived in [7]. The adjusted value of FDI stocks is then compared to reported FDI stocks in form of ratio:

$$ratio_{i(j)t} = \frac{\sum_{j(i)=1}^{J(I)} FDI_{ijt} rankw_{j(i)t}}{\sum_{j(i)=1}^{J(I)} FDI_{ijt}} \tag{9}$$

Higher ratio of FDI assets weighted by ranking of a counter-party $rankw_{jt}$ on total assets, $ratio_{it}$, reflects a situation when a country i exports capital to countries that are more likely to serve as world financial centers or tax havens. On the other side, higher ratio of FDI liabilities weighted by ranking of a counter-party $rankw_{it}$ on total liabilities, $ratio_{jt}$, could be associated with a situation when country j receives a significant portion of international capital from financial centers or tax haven economies.

3.4 Probability model

Workhorse empirical models in financial crisis literature are univariate or multivariate probability models, predominantly based on probit (Ostrihon, 2022) and logit functional form Detken et al. (2014); Davis et al. (2016); Arregui et al. (2013). In our approach we use random effects probit model (Ostrihon, 2022). We provide estimates for both, the unbalanced panel sample (Detken et al., 2014), as well as balance panel.[4]. Random effect is chosen over fixed effed model given the preference to include also countries that did not experience any crisis during the period under consideration. Disregarding such countries from a sample would reduce information set as well as produce biased estimates (Caggiano et al., 2016). We do not include time fixed effects, similar to Davis et al. (2016), but we incorporate two global variables that capture a general trend in world economy instead (oil prices, VIX index as global risk factor).

The baseline model explains the variation in the dependent variable through set of control variables and takes the following form:

$$Prob(FLSS_{it} = 1|M^k_{it-1}, X_{it-1}, \lambda_i) = f(M^k_{it-1}\alpha + X_{it-1}\beta + \lambda_i) \tag{10}$$

M^k_{it-1} represents $k-th$ measure of FDI 'abnormalcy', X_{it-1} represents list of other control variables, λ_i is the country-specific random effect, which is assumed to be normally distributed and independent of all included covariates. Given the probit model framework, the functional form f is derived from the cumulative normal distribution.

In order to keep consistency, when analyzing the impact of measures of 'FDI abnormalcy' on sudden stops associated with decrease in inward positions ($FLSS_{it}$), we use indices calculated for a country's external liabilities positions. Similarly, for retrenchment episodes associated with decrease in outward positions ($FASS_{it}$) we use indices calculated for a country's external assets positions.

The contagion in international finance is a rather well-known phenomenon. Financial crises, and balance of payment crises in particular, are often spatially correlated due to tight cross-border financial linkages that contribute to increasing systemic risk in international financial system, up to a certain point (Calvo et al., 2008). As a consequence, crises tend to be imported especially across geographically related areas. Sudden stop episodes have also been recently increasingly driven by global factors (Eichengreen and Gupta, 2016). From this reason, we also produce regressions that account for possible spatial auto-correlation in dependent variable, i.e. in sudden stop episodes. We employ spatial auto-regressive linear model (SAR model) with random effects where the autoregressive coefficient estimates extent of spatial autocorrelation in dependent variable.[5]

[4]We balance our panel out by reducing the number of countries due to the fact that spatial linear panel model is available only for balanced panels

[5]We acknowledge that linear models with binary dependent variable suffer from several disadvantages. However, we are aware

The SAR model is specified as follows:

$$FASS_{it} = \beta_0 + \rho W_{ij} FASS_{it} + \alpha M^k_{it-1} + \beta X_{it-1} + \lambda_i + \epsilon_{it} \tag{11}$$

where W_{jk} represents spatial weights matrix based on geographical distance, M^k_{it-1} represents $k-th$ measure of FDI 'abnormalcy', X_{it-1} represents list of other control variables, λ_i is the country-specific random effect, which is assumed to be normally distributed and independent of all included covariates.

3.5 Dataset

In the gravity regression models we use the broadest sample, i.e. world sample, available. Dependent variable, i.e. FDI bilateral asset positions (outward FDI), is gathered from the Coordinated Direct Investment Survey compiled by the International Monetary Fund. The CDIS coverage limits our sample to 2009-2019 period. The missing data on assets side are replaced by the information from the mirror position reported by the partner country (inward FDI), similar to Kox and Rojas-Romagosa (2019) and Delatte et al. (2022). List of control variables in benchmark regression corresponds to Delatte et al. (2022). Extended regressions incorporates corporate tax rate, fully extended model includes world governance indicators and measure of number of days and procedures to start a business. Details on the specific source of explanatory variables are available in Table A1.

For the sudden stop regression, dependent variable is calculated with data collected from the International Financial Statistics compiled by the International Monetary Fund. List of control variables broadly corresponds to Agosin et al. (2019), but on top of that includes our three distinct measures of FDI 'abnormality' in bilateral exposures listed in Section 3.3. We also control for global factors, proxied by global risk aversion as captured by the VIX index and oil prices, similar to Forbes and Warnock (2012); Eichengreen and Gupta (2016); Li et al. (2019).

Details on the specific source of the explanatory variables are available in Table A1.The complete list of countries is available in Appendix.

4 Results

4.1 Gravity equation and measures of 'FDI abnormalcy'

In Table [2] we report estimates of the first-step gravity model parameters specified by [3]. Estimated coefficients are in line with our expectations: bilateral distance is the only factor out of selected, which negatively affects the FDI. All the other factors increase the bilateral investment stock mainly: EU membership, tax treaty, common language, common borders, the existence of a colonial relationship and the regional trade agreement. Estimated effect of a common currency on FDI is not statistically significant.

Table [3] provides estimates of the country-time fixed effects calculated from the first stage. Error terms of these regressions represent a measure of the speculative part of FDI. Our results suggest that larger

of only two applications of spatial panel probability models, Kakamu and Wago (2005) and Baltagi et al. (2018) in particular. No currently available specialized econometrical software or specialized libraries in other freeware softwares incorporate procedures for spatial probability panel model estimates. In our future research we aim to further proceed in this direction.

Table 2: First step gravity regression - bilateral determinants

Variable		Variable	
Ln(Distance)	-1.348***	Contiguity	0.604***
	(0.00)		(0.00)
EU membership	0.250**	Common currency	0.063***
	(0.03)		(0.58)
Investment treaty	0.525***	Former colony	0.951***
	(0.00)		(0.00)
Common language	1.035***	RTA	0.565***
	(0.00)		(0.00)
Constant	13.91***		
	(0.00)		
N	83977		
R2	0.65		

Notes: P-values in parentheses. OLS estimator was used with reporter-time and partner-time fixed effects.

values of GDP are related to higher levels of FDI. On the other hand, higher population values are associated with lower FDI. Observance of the rule of law has in general a positive effect on the FDI except the case of the extended model on the side of the reporter, where a negative effect is documented. Being a landlocked country negatively affects FDI stock. Except for these factors, [6] we added some other controls out of which positive effect was reported with higher level of voice, empowerment and accountability control, corporate tax, political stability, regulatory quality and control of corruption; negative effect on FDI was documented in connection with higher values of days required to start a business and number of procedures to start a business.

By using the residuals from the gravity regressions we calculate our three measures of 'FDI abnormality'. Ranking of top 10 countries in a world sample is available in Table A4 given the three regression specifications from Table 3.

According to the Relative ranking of a country, *rankw* measure, which is hypothesized to be associated with a territorial role of financial center or tax haven, top performers include the usual suspects, such as Cayman Islands, Bermuda, Luxembourg, Bahamas, Netherlands or Hong Kong (similar to Delatte et al. (2022)). Importantly, their high ranking remain almost unaffected even after controlling for corporate tax differential (Benchmark+CTR) model. In the full model, that takes into account also a wider variety of business environment indicators, the position of countries reshuffles slightly, with some of the tax haven or financial center countries losing their prominent position. Apparently, the favourable tax environment might not be the only decisive factor that makes or brakes the status of tax haven or financial center. As hypothesised, tax haven and financial center countries also often serve as a conduit for international capital flows which makes them score high at both, the outward (assets) as well as inward (liabilities) sides of external positions.

Top performers according to the Relative share of abnormal FDI (Panel B, Table A4), *ranks* measure, belong to group of countries that are usually not only associated with strong presence of weak institution affecting economic growth prospects but also suffer from debilitating issue of capital flight and associated illicit financial flows. According to GFI (2021b), the most affected countries in terms of relative extent of

[6] For more details see Table [A3] in apendix.

Table 3: Second step FDI gravity regression

	Reporter country fixed effect			Partner country fixed effect		
	(1)	(2)	(3)	(1)	(2)	(3)
	Benchmark	Benchmark + CTR	Fully extended	Benchmark	Benchmark + CTR	Fully extended
Ln(GDP)	0.712***	0.783***	0.566***	0.818***	1.098***	1.088***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Ln(POP)	-0.148***	-0.211***	0.082*	-0.393***	-0.570***	-0.518***
	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)
Rule of law	0.276***	0.258***	-0.980***	0.894***	0.706***	0.726***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Landlocked	-0.392***	-0.180*	-0.228**	-0.684***	-0.342***	-0.271**
	(0.00)	(0.06)	(0.01)	(0.00)	(0.00)	(0.01)
Corporate tax rate		0.011**	0.013***		0.009*	0.011**
		(0.01)	(0.00)		(0.07)	(0.02)
Political stability			0.354***			
			(0.00)			
Regulatory quality			0.830***			-0.344***
			(0.00)			(0.00)
Control of corruption			0.693***			0.277**
			(0.00)			(0.03)
Voice and account.			-0.150**			
			(0.01)			
Time and proced.			0.006***			-0.004**
			(0.00)			(0.04)
Constant	-15.76***	-18.66***	-17.75***	-10.12***	-17.41***	-18.08***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
N	1975	1372	1324	1983	1372	1324
R2	0.59	0.59	0.66	0.68	0.72	0.74

Notes: P-values in parentheses.

trade misinvoicing score highest also in our measure (Sierra Leone, Djibouti, Gambia) and are followed by group of countries (Benin, Sao Tome and Principe, Solomon Islands, Timor-Leste, Saint Kitts and Nevis, Dominica, Kyrgyzstan, Senegal) who are placed in upper third among all developed and developing countries sensitive towards trade misinvoicing issue. Third group of territories is represented by small island states, whose primary feature, in this context, is their extensive financial opacity and secrecy. This group includes Samoa, St. Kitts and Nevis, Vanuatu, Belize, and Dominica who acquire highest positions according to the Financial Secrecy Index published by the Tax Justice Network. Fourth, the rest of the economies can be characterized as less developed countries from Africa or central Asia.

Last category, Adjusted FDI ratio, *ratio* measure, presents a heterogeneous mix in terms of ranking of territories either characterized by there proclivity towards trade misinvoicing issue (Gambia, Ghana, Malawi, Maldives, Sierra Leone, Zimbabwe), money laundering practices (e.g. Macao and Philippines pair, see GFI (2021a)), high financial secrecy (Maldives), or just serving as financial centers (Singapore, Macao) or tax haven (Gibraltar). This group is further accompanied by less developed countries from Africa (Ghana, Nigeria, Gambia, Congo, French Guiana, Kenya, Guinea), Asia and Latin America (Thailand, Malaysia, Brazil) or some special representatives of developed countries (Hungary, Israel, USA). As apparent, involvement in international capital flows stemming from and directed to the most prominent tax haven and financial center territories (*rankw*) is prevalent in a very heterogeneous group of economies.

In Table A5 we also report ranking of countries in our unbalanced sample, but only for illustrative purposes. In sudden stop models discussed in the next section we work with measures derived from the world sample estimates.

4.2 'FDI abnormalcy' measures as determinants of sudden stop episodes

Table 5 and Table 4 report the estimated coefficients on our three measures of 'FDI abnormality' after controlling for standard set explanatory variables. For the sake of brevity, we only report coefficients of interest, tables with full set of estimates are available in online Appendix.

The traditional measure of sudden stop episodes based on excessive decrease in foreign liabilities is reported to be sensitive towards our measures of 'FDI abnormalcy' in several cases.

Table 4: Determinants of sudden stop periods - Foreign liabilities

PANEL A - Relative ranking of a country (rankw)									
Dep. = Foreign Liabilities Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	-1.037	-2.954*	-1.562						
	(0.66)	(0.07)	(0.13)						
Benchmark model + Corporate tax rate				-0.279	-2.093**	-0.451			
				(0.99)	(0.04)	(0.52)			
Full extended model							-0.308	-0.979*	-0.098
							(0.99)	(0.06)	(0.83)
Rho			0.375***			0.376***			0.376***
			(0.00)			(0.00)			(0.00)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	600	490	490	594	490	490	594	490	490
N clusters	65	49	49	64	49	49	64	49	49
PANEL B - Relative share of abnormal FDIs (ranks)									
Dep. = Foreign Liabilities Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	-0.002**	-0.002**	-0.001**						
	(0.01)	(0.04)	(0.04)						
Benchmark model + Corporate tax rate				-0.001	-0.002**	-0.001*			
				(0.11)	(0.05)	(0.07)			
Full extended model							-0.001**	-0.001**	-0.001*
							(0.05)	(0.05)	(0.09)
Rho			0.375***			0.376***			0.375**
			(0.00)			(0.00)			(0.00)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	600	490	490	600	490	490	600	490	490
N clusters	65	49	49	65	49	49	65	49	49
PANEL C - Adjusted FDI ratio (ratio)									
Dep. = Foreign Liabilities Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	10.641	15.420	11.196**						
	(0.90)	(0.12)	(0.01)						
Benchmark model + Corporate tax rate				2.686	3.730	3.781*			
				(0.78)	(0.42)	(0.09)			
Full extended model							1.724	2.929	1.444
							(0.97)	(0.59)	(0.64)
Rho			0.369***			0.377***			0.376***
			(0.00)			(0.00)			(0.00)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	600	490	490	600	490	490	600	490	490
N clusters	65	49	49	65	49	49	65	49	49

Notes: P-values in parentheses. RE represents panel probit model with random effects. SPRE represents linear spatial autoregressive panel model with random effects. For panel probit model with random effects the average marginal effects calculated by delta method are reported. Benchmark model corresponds to 2nd stage model from Delatte et al. (2022). CRT stands for corporate tax rates. Full extended model includes variables from Delatte et al. (2022), corporate tax rates, and other control variables listed in Table A1. Relative ranking of a country is calculated from equation [7].Relative share of abnormal FDIs is calculated from equation [8]. Adjusted FDI ratio is calculated from equation [9].

First, territories that can be characterized as tax haven or financial centers (*rankw*) on a receiving side of international capital are less likely to experience sudden stop episodes (Panel A); however, this finding is not robust to sample selection and is likely to be biased due to spatial auto-correlation, i.e. clustering of crisis events.

The positive effect of 'abnormal FDI' is confirmed for the second indicator, *ranksw*, model specification notwithstanding. Countries with higher share of abnormal FDI on total foreign liabilities face, on average, lower probability of a sudden stop episode than their economic peers. More importantly, the possible hedging properties of abnormal FDIs are so substantial, that they are able to (positively) affect behaviour

Table 5: Determinants of sudden stop periods - Foreign assets

PANEL A - Relative ranking of a country (rankw)									
Dep. = Foreign Assets Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	-2.008	-2.157	0.498						
	(0.57)	(0.62)	(0.76)						
Benchmark model + Corporate tax rate				-2.426	-2.602	0.400			
				(0.37)	(0.44)	(0.71)			
Full extended model							-0.730	-0.650	0.280
							(0.55)	(0.67)	(0.58)
Rho			0.366***			0.366***			0.366***
			(0.00)			(0.00)			(0.00)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	600	490	490	594	490	490	594	490	490
N clusters	65	49	49	64	49	49	64	49	49
PANEL B - Relative share of abnormal FDIs (ranks)									
Dep. = Foreign Assets Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	0.002	-0.005	0.002						
	(0.17)	(0.37)	(0.58)						
Benchmark model + Corporate tax rate				0.003***	-0.004	0.003			
				(0.00)	(0.43)	(0.43)			
Full extended model							0.002***	-0.005	0.001
							(0.00)	(0.29)	(0.77)
Rho			0.367***			0.367***			0.366***
			(0.00)			(0.00)			(0.00)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	600	490	490	600	490	490	600	490	490
N clusters	65	49	49	65	49	49	65	49	49
PANEL C - Adjusted FDI ratio (ratio)									
Dep. = Foreign Assets Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	-0.461	0.035	-0.182						
	(0.65)	(0.97)	(0.81)						
Benchmark model + Corporate tax rate				-0.769	-0.527	-0.405			
				(0.28)	(0.45)	(0.34)			
Full extended model							-0.945	-0.013	-0.777
							(0.55)	(0.99)	(0.52)
Rho			0.366***			0.366***			0.367***
			(0.00)			(0.00)			(0.00)
Control variables	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	600	490	490	600	490	490	600	490	490
N clusters	65	49	49	65	49	49	65	49	49

Notes: P-values in parentheses. RE represents panel probit model with random effects. SPRE represents linear spatial autoregressive panel model with random effects. For panel probit model with random effects the average marginal effects calculated by delta method are reported. Benchmark model corresponds to 2nd stage model from Delatte et al. (2022). CRT stands for corporate tax rates. Full extended model includes variables from Delatte et al. (2022), corporate tax rates, and other control variables listed in Table A1. Relative ranking of a country is calculated from equation [7].Relative share of abnormal FDIs is calculated from equation [8]. Adjusted FDI ratio is calculated from equation [9].

of overall external position.[7] Even after controlling for possible contagion effect (SPRE model) as well as various elements of more liberal business environment (Fully extended model) the significance of our results remains unaffected.

This finding suggests that the nature of illicit capital flows captured by the FDI residuals may still retain some of their more favourable properties in terms of stability-transparency trade-off. In other words, even if sources and means of foreign capital are to be questioned, their inflows may still counteract pressure put on external financing. This finding may therefore support the general notion of the more long-term and less speculative nature of FDI (Eichengreen et al., 2008; Cardarelli et al., 2010; Sula and Willett, 2011; Hattari and Rajan, 2011), even in the presence of unexplained and potentially illicit element.

In Panel C (Table 4, we report results from the estimates with Adjusted FDI ratio indicator, *ratio*. Compared to previous indicator (*ranks*), this measure weights foreign exposure of an individual country by the characteristic trait of a counter-party, in our case the significance of a country in terms of its global role as financial center or tax haven (*rankw*). According to the reported results, comparably higher share of inflows from territories likely serving as tax havens or financial centers could be associated with higher risk of sudden stop episode occurrence, but only for limited gravity model specifications (Benchmark, Benchmark+CTR). Once the quality of institutions and business environment is taken into account, the statistical significance disappears. The tentative conclusion would therefore suggest that economies targeted by capital inflows originating in counter-party countries characterized by lower quality of institutions face higher risks of sudden stop episodes.

Turning our attention to sudden stop episodes measured by reaction of foreign assets (Table 5, we report only very limited, if not zero, effect of any aspect of abnormal FDI. The only exception is a positive effect associated with model adjusted for corporate tax rate and fully extended model estimated on unbalanced sample. From this reason we are inclined to conclude that we do not find a robust empirical evidence that the presence of abnormal capital flows in FDI positions significantly contributes to increasing risk of crisis materialization. Hence, neither the specific character of an economic territory nor its link to tax havens or financial centers represent a decisive factor determining the decision of domestic investors to engage in dis-investment strategies. Another explanation may be related to a well-known empirical observations that the misreporting of outward FDI positions tends to be more prevalent than in the case of inward investments (Angulo and Hierro, 2017). Notwithstanding the underlying reasons (discussed in (Angulo and Hierro, 2017)), while the (more precisely) reported decrease in inflow of external capital can be linked to 'abnormal FDI' positions (Table 4), we find only very weak to no evidence in case of inward positions *precisely* because of the distorted nature of our dependent variable.[8]

Among the list of control variables, the de jure financial openness, i.e. capital mobility, does not have a statistically significant impact, similar to Edwards (2007). Contrary to this, de facto financial openness in terms of levels as well as first difference is reported to have negative in the former, and positive in the latter case. Agosin and Huaita (2012) report similar results for change in de facto openness. Negative sign for financial integration is associated with sudden stop episodes in Forbes and Warnock (2012). In several

[7] By definition, sudden stop episodes are calculated with the use of net total foreign assets and liabilities positions which, on top of the FDI, include additional categories such as portfolio and other investments.

[8] As extensively discussed in Angulo and Hierro (2017), data collected by the IMF in the balance of payments and international investment position statistics, i.e. our dependent variable, differ from the CDIS database in terms of country coverage, valuation principles and net/gross reporting. Given these substantial methodological challenges, one can not simply build a direct link between our dependent variable and the measures of 'FDI abnormalcy', even if accounting principles should say so.

instances we report positive sign for correlation of financial inflows and outflows, a determinant advocated by Agosin et al. (2019). Global risk factor measured by VIX index is shown to be associated with increasing likelihood of sudden stop episodes, a finding reflected in Forbes and Warnock (2012).

In our sample, advanced countries are more susceptible to sudden stop episodes. This finding is in contrast to standard narrative that the sudden stops are often a boon of developing countries with less developed financial systems. However, Agosin et al. (2019) confirm that developed economies have roughly the same probability of experiencing sudden stops in gross capital inflows as those in emerging economies. Fabiani et al. (2021) find that, accounting for differences in what they refer as "mild" and "severe" sudden stops across countries, sudden stops were generally "more frequent and more severe" in Euro area member states relative to their non-Euro area OECD counterparts during the period 1999–2020. Since our sample solely focuses on the post-GR period, the positive relation between level of economic development and sudden stop episodes may reflect a fact that the GVC affected developed countries on a much broader scale than previous historical episodes of financial flows contractions. Higher proclivity towards sudden stop episodes in our sample is also observed for members of currency unions, which again may be driven by experience of Euro are member states, reported by Fabiani et al. (2021).

Studies also document that countries with declining fiscal deficits or increase in fiscal surplus are less likely to face frequent episodes of sudden stops Cardarelli et al. (2010); Hutchison et al. (2010). Contrary, we report increasing incidence of crisis events for countries with better fiscal balances. One plausible explanation could be related to behaviour of fiscal policies during Great Recession. One of the responses to the spread of financial crisis relied on an inclination towards implementation of fiscal austerity measures. Thus, even economies with a relatively sound fiscal positions were striving to maintain their external credibility and, potentially, decreasing their reliance of external financing.[9]

On the policy front, understanding the behavior of sudden stops and the factors that trigger their occurrence can serve to better design appropriate and contingent policies in order to mitigate their frequency and alleviate the severity of these anomalies once they occur. Our results suggest that recent trend in the increase of 'phantom' and 'abnormal' FDI flows can potentially bring about very diverse consequences. Our *first* finding suggests that economies with comparably higher share of inward 'abnormal FDI' were reported to have a lower incidence of sudden stop episodes. However, this (surprisingly) stabilization property of 'abnormal FDI' is not preserved if inflow of capital is to be tracked to territories usually labeled as tax havens or financial centers. As our *second* finding highlights, a tentative evidence points to zero or even increasing likelihood of sudden stop event. *Last*, higher exposure towards 'abnormal' FDI or existing linkages to tax haven and financial center countries are not associated with elevated risk of incidence of retrenchment periods. As apparent, the current nature of FDI flows is so strikingly heterogeneous that any policy response to increasing risks associated with new nature of such flows needs to be diverse and targeted by itself.

5 Conclusions

In this paper we study role of abnormal FDI as a potential driver of stop episodes during 2009-2019 period in sample of developed and developing countries. Volume of abnormal FDI is derived from unexplained

[9] As a point of interest, Forbes and Warnock (2012) show that countries with higher government debt-to-GDP ratio are less prone to experience sudden stop episodes, if net capital flows are used to identify crisis events.

part of country fixed effects in bilateral gravity regression. We construct three measures 'FDI abnormality' that i) approximate role of an economy as financial center or tax haven, ii) calculate contribution of 'FDI abnormality' to total FDI position, iii) adjust value of FDI stock given their exposure towards territories considered as tax havens or financial centers. Using these measures we estimate panel probit model and obtain three important results. We find that economies with comparably higher share of inward 'abnormal FDI' were associated with lower incidence of sudden stop episodes; that capital flows linked to tax haven or financial centers territories may increase likelihood of sudden stop in certain instances; and retrenchment episodes driven by behaviour of domestic investors are not sensitive to any measure of 'FDI abnormality'.

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Appendix

List of countries (sudden stops panel)

Full sample: Albania, Argentina, Australia, Austria, Bahrain, Barbados, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, Hong Kong, China, Colombia, Croatia, Cyprus, Czechia, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, South Korea, Kuwait, Latvia, Lithuania, Malaysia, Malta, Mauritius, Mexico, the Netherlands, New Zealand, Norway, Pakistan, Panama, Poland, Portugal, Romania, the Russian Federation, Samoa, Saudi Arabia, Seychelles, Singapore, Slovakia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, Ukraine, United Kingdom, USA, Venezuela.

Balanced panel: Argentina, Australia, Austria, Belarus, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia, Cyprus, Czechia, Denmark, Egypt, Estonia, Finland, France, Germany, Hungary, Iceland, India, Indonesia, Ireland, Japan, Korea, Latvia, Lithuania, Malaysia, Malta, Mauritius, Mexico, the Netherlands, New Zealand, Pakistan, Panama, Poland, Portugal, the Russian Federation, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, Ukraine, USA.

Table A1: Variables sources and descriptions

Determinant (variable)	*Format*	*Source*	*Description*
Panel A - Gravity model (1st stage)			
Distance	km	CEPII	Distance between capitals, in km
EU membership	dummy	CEPII	1 = Country is a EU member
Investment treaty	dummy	Delatte et al. (2022)	1 = Treaty
Common language	dummy	CEPII	1 = Common official or primary language
Contiguity	dummy	CEPII	1 = Contiguity
Common currency	dummy	Delatte et al. (2022)	1 = Common currency
Former colony	dummy	CEPII	1 = Pair ever in colonial or dependency relationship
RTA	dummy	CEPII	1 = RTA (source: WTO)
Panel B - Gravity model (2nd stage)			
ln(GDP)		CEPII	GDP (current thousands US$)
ln(POP)		CEPII	Population, total in thousands
Rule of law	index	World Governance Indicators	Rule of law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.
Landlocked	dummy	CEPII	1 = landlocked
Corporate tax rate	%	KPMG, OECD	Corporate income tax rate
Political stability	index	World Governance Indicators	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism.
Regulatory quality	index	World Governance Indicators	Regulatory quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.
Control of corruption	index	World Governance Indicators	Control of corruption captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests
Voice and accountability	index	World Governance Indicators	Voice and accountability captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.
Time and proc.	index	CEPII	Days + procedures to start a business
Panel C - Sudden stop regression			
De jure fin. openness	index	Chinn and Ito (2006)	Index measuring a country's degree of capital account openness, 2021 update
De facto fin. openness	% GDP	Lane and Milesi-Ferretti (2018)	Total foreign assets net of gold and liabilities to GDP, 2021 update
De facto fin. openness	YoY change	Lane and Milesi-Ferretti (2018)	Total foreign assets net of gold and liabilities to GDP, 2021 update
ln(GDP)		CEPII	GDP (current thousands US$)
GDP PPP p.c.		CEPII	GDP per cap, PPP (current thousands international $)
NER	YoY change	IMF	Exchange Rates, National Currency Per U.S. Dollar, Period Average, Rate
Fiscal balance	% GDP	IMF	Net government lending/borrowing to GDP
Inflows and outflows correl.	index	IMF	Net incurrence of foreign liabilities, Net increase in foreign assets.
Terms of trade	YoY change	World Development Indicators	Net barter terms of trade index (2000 = 100)
ln(VIX)	index	FRED	CBOE Volatility Index: VIX, Index, Daily, Not Seasonally Adjusted
ln(Oil price)	price	FRED	Crude Oil Prices: West Texas Intermediate (WTI) - Cushing, Oklahoma, Dollars per Barrel, Daily, Not Seasonally Adjusted
Currency union	dummy	own construction	1 = Country is a member of currency union

Table A2: Number of sudden stop (Liabilities) and sudden stop reversals (Assets) episodes in the period 2010–2019, by country group

Panel A - Full sample (65 countries)

		Sudden stop reversals (Assets)										
		Full			Developing				Advanced			
		Crisis	No crisis	Total		Crisis	No crisis	Total		Crisis	No crisis	Total
Sudden stops (Liabilities)	Crisis	72	33	105	Crisis	24	21	45	Crisis	48	12	60
	No crisis	17	478	495	No crisis	10	221	231	No crisis	7	257	264
	Total	89	511	600	Total	34	242	276	Total	55	269	324

Panel B - Balanced sample (49 countries)

		Sudden stop reversals (Assets)										
		Full			Developing				Advanced			
		Crisis	No crisis	Total		Crisis	No crisis	Total		Crisis	No crisis	Total
Sudden stops Liabilities)	Crisis	55	28	83	Crisis	19	20	39	Crisis	36	8	44
	No crisis	15	392	407	No crisis	9	182	191	No crisis	6	210	216
	Total	70	420	490	Total	28	202	230	Total	42	218	260

Notes: Countries are listed as advanced economies given the IMF classification as of 2021.

Table A3: Second step FDI gravity equation - Individual elements

	Reporter country fixed effect						Partner country fixed effect					
	(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	(3)	(4)	(5)	(6)
Ln(GDP)	0.934***	0.728***	0.664***	0.680***	0.750***	0.836***	1.509***	1.144***	0.952***	0.874***	1.081***	1.265***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Ln(POP)	-0.375***	-0.103***	-0.120***	-0.108***	-0.159***	-0.277***	-1.011***	-0.672***	-0.568***	-0.428***	-0.621***	-0.859***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Rule of law												
Landlocked	-0.156***	-0.412***	-0.400***	-0.395***	-0.320***	-0.333***	-0.270***	-0.624***	-0.644***	-0.653***	-0.488***	-0.524***
	(0.1)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Corporate tax rate	0.012***						0.015***					
	(0.00)						(0.00)					
Political stability		0.341***						0.372***				
		(0.00)						(0.00)				
Regulatory quality			0.369***						0.636***			
			(0.00)						(0.00)			
Control of corruption				0.347***						0.808***		
				(0.00)						(0.00)		
Voice and account.					0.276***						0.574***	
					(0.00)						(0.00)	
Time and proced.						-0.004***						-0.006***
						(0.00)						(0.00)
Constant	-19.98***	-16.19***	-15.23***	-15.24***	-16.10***	-17.45***	-20.95***	-13.41***	-11.06***	-9.95***	***-12.78	-15.45***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
N	1375	1977	1975	1975	1974	1902	1375	1985	1983	1983	1982	1916
R2	0.59	0.59	0.60	0.60	0.60	0.60	0.69	0.65	0.66	0.68	0.67	0.65

Notes: P-values in parentheses.

Table A4: List of top countries according to their score in measures of 'FDI abnormality' (world sample, 246 territories)

Panel A - Relative ranking of a country (rankw)

	Reporter (outward FDI)			Partner (inward FDI)		
Rank	Benchm.	Benchm. + CTR	Full	Benchm.	Benchm. + CTR	Full
1	Cayman Isl.	Cayman Isl.	Mauritius	Marshall Isl.	Cayman Isl.	St. Pierre and Miq.
2	Marshall Isl.	Bermuda	Bahamas	Cayman Isl.	St. Pierre and Miq.	Samoa
3	Bermuda	Mauritius	Luxembourg	Liberia	Samoa	Panama
4	Liberia	Bahamas	Neth. Antilles	Belize	Bermuda	Mauritius
5	Mauritius	Luxembourg	Panama	St. Pierre and Miq.	Panama	Bahamas
6	Luxembourg	Neth. Antilles	Netherlands	Panama	Bahamas	St. Vincent and Gren.
7	Bahamas	Netherlands	St. Kitts and Nevis	Samoa	Mauritius	Neth. Antilles
8	Neth. Antilles	Hong Kong	St. Pierre and Miq.	Bermuda	St. Vincent and Gren.	Netherlands
9	Netherlands	Singapore	Libya	Togo	Neth. Antilles	St. Kitts and Nevis
10	Hong Kong	Mozambique	Hong Kong	Bahamas	Netherlands	Dominica

Panel B - Relative share of abnormal FDI (ranks)

	Reporter (outward FDI)			Partner (inward FDI)		
Rank	Benchm.	Benchm. + CTR	Full	Benchm.	Benchm. + CTR	Full
1	Nauru	Gambia	Gambia	Solomon Isl.	Solomon Isl.	Solomon Isl.
2	Tuvalu	Djibouti	Djibouti	Cent. Afr. Republic	Sierra Leone	Sierra Leone
3	Sao Tome and Pr.	Madagascar	Madagascar	Timor-Leste	Dominica	Dominica
4	Gambia	Burkina Faso	Burkina Faso	Nauru	Turkmenistan	Fiji
5	Djibouti	Vanuatu	Vanuatu	Sao Tome and Pr.	Fiji	St. Vincent and Gren.
6	Tonga	Benin	Solomon Isl.	Somalia	St. Vincent and Gren.	Djibouti
7	Marshall Isl.	Solomon Isl.	St. Kitts and Nevis	Palau	Senegal	Papua New Guinea
8	Micronesia	Sierra Leone	St. Pierre and Miq.	Eritrea	Djibouti	Senegal
9	Timor-Leste	St. Kitts and Nevis	Samoa	Guinea	Gambia	Kyrgyzstan
10	Cent. Afr. Republic	Samoa	Benin	Belize	Uzbekistan	Vanuatu

Panel C - Adjusted FDI ratio (ratio)

	Reporter (outward FDI)			Partner (inward FDI)		
Rank	Benchm.	Benchm. + CTR	Full	Benchm.	Benchm. + CTR	Full
1	Macao	Macao	El Salvador	Brazil	Brazil	Mayotte
2	Aruba	Aruba	Tuvalu	Thailand	Thailand	Micronesia
3	Sudan	Israel	Malawi	Mayotte	Philippines	Madagascar
4	Israel	Mauritius	Seychelles	Philippines	Mayotte	Guinea
5	Mauritius	Ghana	Sudan	Micronesia	Micronesia	Zimbabwe
6	Sao Tome and Pr.	Singapore	Sierra Leone	Kuwait	Kuwait	Mauritania
7	Singapore	Nigeria	Kenya	USA	USA	Kenya
8	Ghana	Hungary	Zimbabwe	Guinea	Madagascar	French Guiana
9	Nigeria	Sudan	Maldives	Madagascar	Malaysia	Gibraltar
10	Gambia	El Salvador	Gabon	Malaysia	Guinea	Dem. rep. Congo

Table A5: List of top countries according to their score in measures of 'FDI abnormality' (full sample, 65 countries)

Panel A - Relative ranking of a country (rankw)

	Reporter (outward FDI)			Partner (inward FDI)		
Rank	Benchm.	Benchm. + CTR	Full	Benchm.	Benchm. + CTR	Full
1	Mauritius	Mauritius	Mauritius	Panama	Samoa	Samoa
2	Netherlands	Netherlands	Panama	Samoa	Panama	Panama
3	Hong Kong	Hong Kong	Netherlands	Seychelles	Mauritius	Mauritius
4	Singapore	Singapore	Hong Kong	Mauritius	Netherlands	Netherlands
5	Panama	Panama	Samoa	China	China	Barbados
6	Australia	Australia	Australia	Netherlands	Barbados	Cyprus
7	Brazil	Brazil	Malta	Russia	Cyprus	China
8	Barbados	Barbados	Singapore	Barbados	Russia	Hong Kong
9	South Africa	South Africa	Barbados	USA	Hong Kong	Russia
10	Malaysia	Malaysia	Malaysia	Hong Kong	South Africa	South Africa

Panel B - Relative share of abnormal FDI (ranks)

	Reporter (outward FDI)			Partner (inward FDI)		
Rank	Benchm.	Benchm. + CTR	Full	Benchm.	Benchm. + CTR	Full
1	Samoa	Samoa	Samoa	Seychelles	Panama	Panama
2	Seychelles	Mauritius	Mauritius	Panama	Pakistan	Pakistan
3	Mauritius	Panama	Barbados	Pakistan	Samoa	Samoa
4	Panama	Bulgaria	Panama	Samoa	Albania	Albania
5	Bulgaria	Ukraine	Ukraine	Ukraine	Ukraine	Mauritius
6	Venezuela	Venezuela	Malta	Albania	Mauritius	Ukraine
7	Ukraine	Latvia	Latvia	Egypt	Bulgaria	Bulgaria
8	Latvia	Estonia	Bulgaria	Mauritius	Egypt	Egypt
9	Estonia	Albania	Pakistan	Belarus	Belarus	Bahrain
10	Albania	Pakistan	Bahrain	Bulgaria	Barbados	Latvia

Panel C - Adjusted FDI ratio (ratio)

	Reporter (outward FDI)			Partner (inward FDI)		
Rank	Benchm.	Benchm. + CTR	Full	Benchm.	Benchm. + CTR	Full
1	Israel	Israel	Seychelles	Brazil	Brazil	India
2	Mauritius	Mauritius	India	Thailand	Thailand	South Africa
3	Singapore	Singapore	Iceland	Kuwait	Kuwait	Ireland
4	Hungary	Hungary	Russia	USA	USA	Egypt
5	Hong Kong	Japan	Belgium	Malaysia	Malaysia	Qatar
6	Japan	Hong Kong	Ukraine	Canada	Canada	Malta
7	Ireland	Ireland	Indonesia	China	China	Barbados
8	Iceland	Seychelles	Belarus	Ireland	Japan	United Kingdom
9	Cyprus	Chile	Switzerland	Bahrain	Chile	Israel
10	Chile	Russia	Samoa	Chile	Greece	New Zealand

Table A6: Determinants of sudden stop periods (foreign assets) including the Relative ranking of a country (rankw)

Dep. = Foreign Assets Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	-2.008	-2.157	0.498						
	(0.57)	(0.62)	(0.76)						
Benchmark model + Tax rate				-2.426	-2.602	0.400			
				(0.37)	(0.44)	(0.71)			
Full extended model							-0.730	-0.650	0.280
							(0.55)	(0.67)	(0.58)
De iure fin. openness	0.005	-0.016	0.013	0.011	-0.017	0.012	0.014	-0.013	0.011
	(0.93)	(0.78)	(0.77)	(0.83)	(0.76)	(0.78)	(0.78)	(0.82)	(0.80)
De facto fin. openness (% GDP)	-0.000**	-0.000**	0.000	-0.000**	-0.000**	0.000	-0.000**	-0.000**	0.000
	(0.01)	(0.02)	(0.22)	(0.01)	(0.02)	(0.20)	(0.01)	(0.02)	(0.20)
De facto fin. openness (YoY change)	0.001***	0.001***	0.000***	0.001***	0.001***	0.000***	0.001***	0.001***	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Ln(GDP)	-0.004	0.002	0.005	-0.006	0.002	0.005	-0.007	0.001	0.005
	(0.65)	(0.87)	(0.56)	(0.45)	(0.86)	(0.56)	(0.42)	(0.89)	(0.57)
GDP PPP p.c.	0.002*	0.002*	0.001	0.002*	0.002*	0.001	0.002*	0.002*	0.001
	(0.07)	(0.07)	(0.37)	(0.08)	(0.07)	(0.37)	(0.09)	(0.08)	(0.35)
NER (YoY change)	-0.007**	-0.006*	-0.003*	-0.007**	-0.006*	-0.003*	-0.007**	-0.006*	-0.003*
	(0.02)	(0.06)	(0.07)	(0.02)	(0.06)	(0.07)	(0.02)	(0.06)	(0.07)
Fiscal balance (% GDP)	0.003	0.010**	0.006	0.003	0.011**	0.006	0.003	0.010**	0.006*
	(0.41)	(0.02)	(0.11)	(0.37)	(0.02)	(0.11)	(0.38)	(0.02)	(0.10)
Inflows and outflows correlation	0.123**	0.125	0.059	0.130**	0.127	0.060	0.127**	0.123	0.060
	(0.04)	(0.12)	(0.18)	(0.04)	(0.12)	(0.17)	(0.04)	(0.12)	(0.17)
Terms of trade (YoY change)	0.002	0.000	-0.001	0.002	0.000	-0.001	0.002	0.000	-0.001
	(0.43)	(0.92)	(0.78)	(0.43)	(0.92)	(0.78)	(0.43)	(0.91)	(0.78)
ln(VIX)	0.115*	0.118*	0.090	0.115*	0.121*	0.090	0.115*	0.119*	0.090
	(0.06)	(0.07)	(0.14)	(0.06)	(0.07)	(0.14)	(0.06)	(0.07)	(0.14)
ln(Oil price)	-0.007	-0.001	-0.020	-0.010	0.001	-0.021	-0.011	-0.001	-0.020
	(0.89)	(0.99)	(0.71)	(0.85)	(0.99)	(0.71)	(0.83)	(0.98)	(0.72)
Currency union (1=member)	0.047**	0.053**	0.043	0.042**	0.052**	0.043	0.044**	0.054**	0.044
	(0.02)	(0.02)	(0.13)	(0.04)	(0.02)	(0.13)	(0.03)	(0.01)	(0.13)
Rho			0.366***			0.366***			0.366***
			(0.00)			(0.00)			(0.00)
Constant			-0.237			-0.236			-0.237
			(0.49)			(0.49)			(0.49)
N	600	490	490	594	490	490	594	490	490
N_clust	65	49	49	64	49	49	64	49	49

Notes: P-values in parentheses. RE represents panel probit model with random effects. SPRE represents linear spatial autoregressive panel model with random effects. For panel probit model with random effects the average marginal effects calculated by delta method are reported. Benchmark model corresponds to 2nd stage model from Delatte et al. (2022). CRT stands for corporate tax rates. Full extended model includes variables from Delatte et al. (2022), corporate tax rates, and other control variables listed in Table A1. Relative ranking of a country is calculated from equation [7].

Table A7: Determinants of sudden stop periods (foreign assets) including the Relative share of abnormal FDIs (ranks)

Dep. = Foreign Assets Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	0.002	-0.005	0.002						
	(0.17)	(0.37)	(0.58)						
Benchmark model + Tax rate				0.003***	-0.004	0.003			
				(0.00)	(0.43)	(0.43)			
Full extended model							0.002***	-0.005	0.001
							(0.00)	(0.29)	(0.77)
De iure fin. openness	0.009	-0.007	0.010	0.014	-0.008	0.008	0.016	-0.003	0.011
	(0.86)	(0.90)	(0.83)	(0.78)	(0.90)	(0.86)	(0.74)	(0.96)	(0.80)
De facto fin. openness (% GDP)	-0.000***	-0.000**	0.000	-0.000***	-0.000**	-0.000*	-0.000***	-0.000**	0.000
	(0.00)	(0.01)	(0.11)	(0.00)	(0.01)	(0.09)	(0.00)	(0.01)	(0.13)
De facto fin. openness (YoY change)	0.001***	0.001***	0.000***	0.001***	0.001**	0.000***	0.001***	0.001***	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Ln(GDP)	0.000	-0.001	0.006	0.000	-0.001	0.006	0.000	-0.002	0.005
	(0.99)	(0.93)	(0.50)	(0.96)	(0.96)	(0.48)	(0.99)	(0.86)	(0.52)
GDP PPP p.c.	0.002*	0.002	0.001	0.002**	0.002	0.001	0.002*	0.002	0.001
	(0.05)	(0.11)	(0.35)	(0.05)	(0.11)	(0.31)	(0.06)	(0.12)	(0.37)
NER (YoY change)	-0.007**	-0.006*	-0.003*	-0.007**	-0.006*	-0.003*	-0.007**	-0.006*	-0.003*
	(0.02)	(0.06)	(0.07)	(0.02)	(0.06)	(0.07)	(0.02)	(0.06)	(0.07)
Fiscal balance (% GDP)	0.002	0.011**	0.006	0.002	0.011**	0.005	0.003	0.011**	0.006*
	(0.44)	(0.02)	(0.11)	(0.43)	(0.02)	(0.11)	(0.41)	(0.02)	(0.1)
Inflows and outflows correlation	0.115*	0.120	0.060	0.115**	0.120	0.061	0.115**	0.117	0.060
	(0.05)	(0.12)	(0.16)	(0.05)	(0.12)	(0.16)	(0.05)	(0.13)	(0.16)
Terms of trade (YoY change)	0.002	0.000	-0.001	0.002	0.000	-0.001	0.002	0.000	-0.001
	(0.41)	(0.90)	(0.78)	(0.41)	(0.90)	(0.78)	(0.41)	(0.91)	(0.78)
ln(VIX)	0.114*	0.119*	0.090	0.112*	0.119*	0.090	0.112*	0.119*	0.090
	(0.06)	(0.06)	(0.14)	(0.06)	(0.06)	(0.14)	(0.06)	(0.06)	(0.14)
ln(Oil price)	-0.004	-0.003	-0.020	-0.004	-0.003	-0.020	-0.004	-0.004	-0.020
	(0.94)	(0.96)	(0.72)	(0.93)	(0.97)	(0.73)	(0.94)	(0.95)	(0.71)
Currency union (1=member)	0.051**	0.052**	0.044	0.051**	0.053**	0.045	0.050**	0.052**	0.043
	(0.01)	(0.02)	(0.12)	(0.01)	(0.02)	(0.12)	(0.01)	(0.02)	(0.14)
Rho			0.367***			0.367***			0.366***
			(0.00)			(0.00)			(0.00)
Constant			-0.260			-0.271			-0.249
			(0.46)			(0.44)			(0.47)
N	600	490	490	600	490	490	600	490	490
N clusters	65	49	49	65	49	49	65	49	49

Notes: P-values in parentheses. RE represents panel probit model with random effects. SPRE represents linear spatial autoregressive panel model with random effects. For panel probit model with random effects the average marginal effects calculated by delta method are reported. Benchmark model corresponds to 2nd stage model from Delatte et al. (2022). CRT stands for corporate tax rates. Full extended model includes variables from Delatte et al. (2022), corporate tax rates, and other control variables listed in Table A1. Relative share of abnormal FDIs is calculated from equation [8].

Table A8: Determinants of sudden stop periods (foreign assets) including the Adjusted FDI ratio (ratio)

Dep. = Foreign Assets Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	-0.461	0.035	-0.182						
	(0.65)	(0.97)	(0.81)						
Benchmark model + Tax rate				-0.769	-0.527	-0.405			
				(0.28)	(0.45)	(0.34)			
Full extended model							-0.945	-0.013	-0.777
							(0.55)	(0.99)	(0.52)
De iure fin. openness	0.002	-0.012	0.011	-0.005	-0.021	0.007	0.001	-0.013	0.007
	(0.97)	(0.83)	(0.80)	(0.92)	(0.71)	(0.88)	(0.99)	(0.82)	(0.87)
De facto fin. openness (% GDP)	-0.000***	-0.000**	0.000	-0.000***	-0.000**	0.000	-0.000***	-0.000**	0.000
	(0.00)	(0.01)	(0.16)	(0.00)	(0.02)	(0.17)	(0.00)	(0.01)	(0.14)
De facto fin. openness (YoY change)	0.001***	0.001***	0.000***	0.001***	0.001***	0.000***	0.001***	0.001***	0.000***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Ln(GDP)	-0.003	0.001	0.006	-0.002	0.003	0.007	-0.003	0.001	0.006
	(0.67)	(0.90)	(0.52)	(0.78)	(0.76)	(0.43)	(0.68)	(0.90)	(0.49)
GDP PPP p.c.	0.002*	0.002*	0.001	0.002*	0.002*	0.001	0.002*	0.002*	0.001
	(0.06)	(0.08)	(0.39)	(0.06)	(0.08)	(0.39)	(0.06)	(0.08)	(0.36)
NER (YoY change)	-0.008**	-0.006*	-0.004*	-0.008**	-0.006*	-0.004*	-0.007**	-0.006*	-0.004*
	(0.02)	(0.06)	(0.07)	(0.01)	(0.06)	(0.06)	(0.02)	(0.06)	(0.06)
Fiscal balance (% GDP)	0.002	0.010**	0.006	0.002	0.010**	0.005	0.002	0.010**	0.005
	(0.44)	(0.02)	(0.11)	(0.44)	(0.02)	(0.11)	(0.45)	(0.02)	(0.11)
Inflows and outflows correlation	0.118**	0.120	0.060	0.115*	0.118	0.060	0.121**	0.120	0.062
	(0.05)	(0.12)	(0.17)	(0.05)	(0.13)	(0.17)	(0.04)	(0.12)	(0.16)
Terms of trade (YoY change)	0.002	0.000	-0.001	0.002	0.000	-0.001	0.002	0.000	-0.001
	(0.42)	(0.91)	(0.78)	(0.42)	(0.91)	(0.78)	(0.42)	(0.91)	(0.80)
ln(VIX)	0.113*	0.117*	0.089	0.114*	0.117*	0.090	0.114*	0.117*	0.088
	(0.06)	(0.06)	(0.14)	(0.06)	(0.06)	(0.14)	(0.06)	(0.06)	(0.15)
ln(Oil price)	-0.009	-0.002	-0.022	-0.010	-0.004	-0.023	-0.011	-0.002	-0.024
	(0.86)	(0.98)	(0.70)	(0.86)	(0.95)	(0.68)	(0.84)	(0.98)	(0.67)
Currency union (1=member)	0.047**	0.055**	0.041	0.045**	0.052**	0.039	0.048**	0.055**	0.042
	(0.02)	(0.01)	(0.13)	(0.02)	(0.01)	(0.15)	(0.01)	(0.01)	(0.11)
Rho			0.366***			0.366***			0.367***
			(0.00)			(0.00)			(0.00)
Constant			-0.239			-0.250			-0.222
			(0.49)			(0.47)			(0.52)
N	600	490	490	600	490	490	600	490	490
N clusters	65	49	49	65	49	49	65	49	49

Notes: P-values in parentheses. RE represents panel probit model with random effects. SPRE represents linear spatial autoregressive panel model with random effects. For panel probit model with random effects the average marginal effects calculated by delta method are reported. Benchmark model corresponds to 2nd stage model from Delatte et al. (2022). CRT stands for corporate tax rates. Full extended model includes variables from Delatte et al. (2022), corporate tax rates, and other control variables listed in Table A1. Adjusted FDI ratio is calculated from equation [9].

Table A9: Determinants of sudden stop periods - Foreign liabilities

	Relative ranking of a country (rankw)								
Dep. = Foreign Liabilities Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	-1.037	-2.954*	-1.562						
	(0.66)	(0.07)	(0.13)						
Benchmark model + Tax rate				-0.279	-2.093**	-0.451			
				(0.99)	(0.04)	(0.52)			
Full extended model							-0.308	-0.979*	-0.098
							(0.99)	(0.06)	(0.83)
De iure fin. openness	-0.045	-0.092*	-0.045	-0.039	-0.091*	-0.046	-0.038	-0.090*	-0.048
	(0.36)	(0.08)	(0.32)	(0.96)	(0.09)	(0.30)	(0.97)	(0.09)	(0.29)
De facto fin. openness (% GDP)	-0.000**	-0.000**	-0.000**	0.000	-0.000**	-0.000**	0.000	-0.000**	-0.000**
	(0.00)	(0.05)	(0.01)	(0.94)	(0.03)	(0.01)	(0.96)	(0.02)	(0.00)
De facto fin. openness (YoY change)	0.001***	0.001**	0.000***	0.001	0.001**	0.000***	0.001	0.001**	0.000***
	(0.00)	(0.01)	(0.00)	(0.92)	(0.01)	(0.00)	(0.94)	(0.01)	(0.00)
Ln(GDP)	0.004	0.008	0.015*	0.001	0.006	0.014*	0.001	0.006	0.014
	(0.63)	(0.65)	(0.07)	(0.98)	(0.68)	(0.10)	(0.99)	(0.72)	(0.10)
GDP PPP p.c.	0.002*	0.002	0.001	0.002	0.002	0.001	0.002	0.002	0.001
	(0.09)	(0.16)	(0.53)	(0.95)	(0.12)	(0.48)	(0.97)	(0.11)	(0.44)
NER (YoY change)	-0.007**	-0.007	-0.004*	-0.007	-0.007	-0.004*	-0.007	-0.007	-0.004*
	(0.01)	(0.23)	(0.07)	(0.96)	(0.17)	(0.07)	(0.97)	(0.16)	(0.07)
Fiscal balance (% GDP)	0.003	0.011	0.008*	0.003	0.011	0.008*	0.003	0.011	0.008*
	(0.40)	(0.56)	(0.06)	(0.98)	(0.48)	(0.06)	(0.99)	(0.47)	(0.06)
Inflows and outflows correlation	0.093*	0.098	0.081	0.096	0.097	0.080	0.096	0.096	0.080
	(0.10)	(0.44)	(0.10)	(0.97)	(0.39)	(0.11)	(0.98)	(0.38)	(0.11)
Terms of trade (YoY change)	0.001	-0.002	-0.002	0.001	-0.002	-0.002	0.001	-0.002	-0.002
	(0.47)	(0.39)	(0.41)	(0.96)	(0.41)	(0.42)	(0.97)	(0.41)	(0.42)
ln(VIX)	0.157**	0.165**	0.132*	0.157	0.167**	0.132*	0.157	0.167**	0.132*
	(0.03)	(0.04)	(0.08)	(0.67)	(0.04)	(0.08)	(0.74)	(0.04)	(0.08)
ln(Oil price)	0.027	0.031	-0.001	0.026	0.032	0.001	0.025	0.033	0.001
	(0.64)	(0.67)	(0.99)	(0.99)	(0.65)	(0.99)	(0.99)	(0.64)	(0.98)
Currency union (1=member)	0.051**	0.072**	0.043*	0.050	0.072**	0.044*	0.049	0.073**	0.046*
	(0.02)	(0.01)	(0.09)	(0.95)	(0.01)	(0.08)	(0.97)	(0.01)	(0.07)
Rho			0.375***			0.376***			0.376***
			(0.00)			(0.00)			(0.00)
Constant			-0.574*			-0.567*			-0.568*
			(0.06)			(0.06)			(0.06)
N	600	490	490	594	490	490	594	490	490
N clusters	65	49	49	64	49	49	64	49	49

Notes: P-values in parentheses. RE represents panel probit model with random effects. SPRE represents linear spatial autoregressive panel model with random effects. For panel probit model with random effects the average marginal effects calculated by delta method are reported. Benchmark model corresponds to 2nd stage model from Delatte et al. (2022). CRT stands for corporate tax rates. Full extended model includes variables from Delatte et al. (2022), corporate tax rates, and other control variables listed in Table A1. Relative ranking of a country is calculated from equation [7].

Table A10: Determinants of sudden stop periods - Foreign liabilities

	Relative share of abnormal FDIs (ranks)								
Dep. = Foreign Liabilities Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	-0.002**	-0.002**	-0.001**						
	(0.01)	(0.04)	(0.04)						
Benchmark model + Tax rate				-0.001	-0.002**	-0.001*			
				(0.11)	(0.05)	(0.07)			
Full extended model							-0.001**	-0.001**	-0.001*
							(0.05)	(0.05)	(0.09)
De iure fin. openness	-0.038	-0.091*	-0.046	-0.042	-0.090*	-0.045	-0.039	-0.087	-0.044
	(0.44)	(0.09)	(0.30)	(0.40)	(0.10)	(0.31)	(0.44)	(0.11)	(0.33)
De facto fin. openness (% GDP)	-0.000***	-0.000**	-0.000***	-0.000***	-0.000**	-0.000***	-0.000***	-0.000**	-0.000***
	(0.00)	(0.03)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.02)	(0.00)
De facto fin. openness (YoY change)	0.001**	0.001**	0.000***	0.001***	0.001**	0.000***	0.001***	0.001**	0.000***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)
Ln(GDP)	0.000	0.003	0.013	0.002	0.002	0.013	0.002	0.003	0.013
	(0.99)	(0.87)	(0.15)	(0.84)	(0.88)	(0.15)	(0.85)	(0.87)	(0.15)
GDP PPP p.c.	0.002	0.002	0.001	0.002	0.002	0.001	0.002	0.002	0.001
	(0.17)	(0.13)	(0.52)	(0.12)	(0.13)	(0.53)	(0.13)	(0.13)	(0.53)
NER (YoY change)	-0.007**	-0.007	-0.004*	-0.007**	-0.007	-0.004*	-0.007**	-0.007	-0.004*
	(0.01)	(0.23)	(0.07)	(0.01)	(0.22)	(0.07)	(0.01)	(0.19)	(0.07)
Fiscal balance (% GDP)	0.003	0.011	0.007*	0.003	0.011	0.007*	0.003	0.011	0.007*
	(0.41)	(0.58)	(0.07)	(0.42)	(0.57)	(0.07)	(0.41)	(0.54)	(0.06)
Inflows and outflows correlation	0.085	0.084	0.072	0.086	0.083	0.072	0.086	0.086	0.075
	(0.13)	(0.58)	(0.16)	(0.12)	(0.58)	(0.16)	(0.12)	(0.53)	(0.14)
Terms of trade (YoY change)	0.001	-0.002	-0.002	0.001	-0.002	-0.002	0.001	-0.002	-0.002
	(0.48)	(0.43)	(0.42)	(0.47)	(0.43)	(0.42)	(0.47)	(0.45)	(0.42)
ln(VIX)	0.154**	0.167**	0.133*	0.156**	0.167**	0.133*	0.156**	0.167**	0.133*
	(0.03)	(0.04)	(0.07)	(0.02)	(0.04)	(0.07)	(0.02)	(0.05)	(0.07)
ln(Oil price)	0.023	0.031	-0.001	0.026	0.031	-0.001	0.026	0.031	0.000
	(0.69)	(0.66)	(0.99)	(0.66)	(0.67)	(0.99)	(0.65)	(0.66)	(0.99)
Currency union (1=member)	0.045**	0.071**	0.044*	0.049**	0.071**	0.044*	0.049**	0.071**	0.043*
	(0.04)	(0.02)	(0.08)	(0.03)	(0.02)	(0.09)	(0.03)	(0.02)	(0.09)
Rho			0.375***			0.376***			0.375**
			(0.00)			(0.00)			(0.00)
Constant			-0.521*			-0.519*			-0.526*
			(0.08)			(0.08)			(0.08)
N	600	490	490	600	490	490	600	490	490
N clusters	65	49	49	65	49	49	65	49	49

Notes: P-values in parentheses. RE represents panel probit model with random effects. SPRE represents linear spatial autoregressive panel model with random effects. For panel probit model with random effects the average marginal effects calculated by delta method are reported. Benchmark model corresponds to 2nd stage model from Delatte et al. (2022). CRT stands for corporate tax rates. Full extended model includes variables from Delatte et al. (2022), corporate tax rates, and other control variables listed in Table A1. Relative share of abnormal FDIs is calculated from equation [8].

Table A11: Determinants of sudden stop periods - Foreign liabilities

	Adjusted FDI ratio (ratio)								
Dep. = Foreign Liabilities Sudden Stops	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE	RE unbal.	RE	SPRE
Benchmark model	10.641	15.420	11.196**						
	(0.90)	(0.12)	(0.01)						
Benchmark model + Tax rate				2.686	3.730	3.781*			
				(0.78)	(0.42)	(0.09)			
Full extended model							1.724	2.929	1.444
							(0.97)	(0.59)	(0.64)
De iure fin. openness	-0.041	-0.061	-0.026	-0.046	-0.083	-0.038	-0.041	-0.084	-0.042
	(0.87)	(0.23)	(0.53)	(0.86)	(0.11)	(0.37)	(0.92)	(0.12)	(0.35)
De facto fin. openness (% GDP)	0.000	-0.000**	-0.000***	0.000	-0.000**	-0.000***	0.000	-0.000**	-0.000***
	(0.65)	(0.01)	(0.00)	(0.80)	(0.02)	(0.00)	(0.78)	(0.02)	(0.00)
De facto fin. openness (YoY change)	0.001	0.001**	0.000***	0.001	0.001***	0.000***	0.001	0.001***	0.000***
	(0.47)	(0.01)	(0.00)	(0.80)	(0.00)	(0.00)	(0.73)	(0.00)	(0.00)
Ln(GDP)	0.001	0.001	0.011	0.003	0.003	0.012	0.004	0.004	0.014
	(0.96)	(0.92)	(0.22)	(0.89)	(0.83)	(0.19)	(0.96)	(0.76)	(0.1)
GDP PPP p.c.	0.002	0.002	0.000	0.002	0.002*	0.000	0.002	0.003*	0.001
	(0.17)	(0.24)	(0.95)	(0.89)	(0.10)	(0.61)	(0.86)	(0.07)	(0.41)
NER (YoY change)	-0.007	-0.006*	-0.003*	-0.007	-0.007	-0.004*	-0.007	-0.007	-0.004*
	(0.78)	(0.08)	(0.09)	(0.92)	(0.16)	(0.08)	(0.89)	(0.13)	(0.07)
Fiscal balance (% GDP)	0.004	0.012	0.009**	0.004	0.011	0.008**	0.003	0.011	0.008*
	(0.91)	(0.29)	(0.03)	(0.96)	(0.47)	(0.05)	(0.96)	(0.43)	(0.06)
Inflows and outflows correlation	0.084	0.098	0.086*	0.088	0.093	0.083*	0.090	0.096	0.080
	(0.88)	(0.24)	(0.09)	(0.95)	(0.37)	(0.10)	(0.94)	(0.36)	(0.11)
Terms of trade (YoY change)	0.001	-0.002	-0.002	0.001	-0.002	-0.002	0.001	-0.002	-0.002
	(0.79)	(0.44)	(0.47)	(0.93)	(0.45)	(0.46)	(0.88)	(0.44)	(0.43)
ln(VIX)	0.168**	0.173**	0.140*	0.160	0.167**	0.134*	0.160	0.171**	0.133*
	(0.01)	(0.03)	(0.06)	(0.54)	(0.04)	(0.07)	(0.53)	(0.05)	(0.08)
ln(Oil price)	0.046	0.058	0.024	0.032	0.037	0.008	0.032	0.040	0.004
	(0.60)	(0.40)	(0.69)	(0.97)	(0.60)	(0.90)	(0.90)	(0.56)	(0.95)
Currency union (1=member)	0.076**	0.104***	0.071**	0.065	0.089***	0.063**	0.053	0.076***	0.046*
	(0.05)	(0.00)	(0.01)	(0.89)	(0.00)	(0.02)	(0.87)	(0.00)	(0.07)
Rho			0.369***			0.377***			0.376***
			(0.00)			(0.00)			(0.00)
Constant			-0.693**			-0.588**			-0.593*
			(0.02)			(0.05)			(0.06)
N	600	490	490	600	490	490	600	490	490
N clusters	65	49	49	65	49	49	65	49	49

Notes: P-values in parentheses. RE represents panel probit model with random effects. SPRE represents linear spatial autoregressive panel model with random effects. For panel probit model with random effects the average marginal effects calculated by delta method are reported. Benchmark model corresponds to 2nd stage model from Delatte et al. (2022). CRT stands for corporate tax rates. Full extended model includes variables from Delatte et al. (2022), corporate tax rates, and other control variables listed in Table A1. Adjusted FDI ratio is calculated from equation [9].