

Research Article

Public Debt and Foreign Direct Investment in Transition Economies: A Data-Driven Comparative Analysis of Crisis Dynamics and Threshold Effects

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Abstract

This study examines the relationship between public debt and foreign direct investment (FDI) in six Western Balkan (WB-6) countries and eleven Central and Eastern European Union (CE-EU-11) countries during the period 2000–2023. The results, based on a dynamic panel threshold regression model with endogenous regressors, indicate that public debt has a statistically significant adverse effect on FDI across both debt regimes, with the estimated threshold ranging between approximately 69% and 72% of GDP. These findings provide evidence of a persistent crowding-out effect of public debt on foreign investment. While the magnitude of the effect varies across debt regimes, public debt consistently discourages FDI inflows. The findings also reveal strong persistence in FDI, with moderate inflation and institutional quality exerting positive effects. Furthermore, the positive interaction between EU membership and public debt suggests that foreign investors are more tolerant of higher public debt levels in Central and Eastern European EU countries than in the Western Balkans.

Keywords: Foreign Direct Investment; Public Debt; Dynamic Panel Threshold Regression; Debt Threshold; EU Membership; Western Balkans.

INTRODUCTION

The challenge of addressing the increased public debt has pushed both scholars and governments to find ways of reducing it or filling the gap. This can be achieved through economic reforms such as monetary policy, taxes, investment in profitable projects, interest rates, and attracting foreign direct investment (FDI), among others. The latter is the focus of this paper. If borrowing from abroad does not result in reducing public debt, then one of the preferred options is to attract FDI instead. This experience has been proven

successful for several transition economies that went through shortages during the transition period from centrally to market open economy. Instead of borrowing more from foreign countries and international financial institutions to boost economic performance, FDI is promoted as an alternative measure to reduce the public debt [1].

One of the main macroeconomic indicators is the public debt, which is usually used as an institutional instrumental factor for enhancing the FDI promotion policies in the transition countries [2]. It is also used by the countries with capital shortage as a cost-related factor for financing social and economic welfare, which, via a second-round effect, may serve as an enhancement mechanism for promoting FDI-related policies, thus enabling the indebted countries to form an image in international markets [3]. Regarding the first-round effect of public debt on general welfare improvement, through the improvement of the country's institutional performance (law and judiciary system, efficiency of public administration) and the general economic performance (infrastructure, manufacturing, and private sector development), an increase in inward FDI stock in the host countries comes in a second round, stimulated by the economic development led by public debt. Therefore, public debt, by empirical evidence, is considered one of the institutionally related factors determining the inward FDI flows in the transition countries [3-5].

The purpose of this research work is to analyze the effects of public debt on FDI in the main selected countries in Western Balkan which is Kosovo, Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, and Serbia in comparison to the Central East European Union countries such as Czech Republic, Bulgaria, Estonia, Poland, Romania, Croatia, Latvia, Hungary, Slovak Republic, Lithuania, and Slovenia. Based on this analysis, we need to identify other institutional and macroeconomic factors on FDI in both regions. The main research issue of interest will be the following:

1. Does public debt influence FDI, and are there differences between the WB-6 and CE-EU countries in the debt threshold where its effect on FDI changes?
2. Do selected macroeconomic and institutional-related factors explain the level of inward FDI stock and their magnitudes, or do other specific reasons need to be considered for individual countries' specifics?
3. How do major economic crises, including the Global Financial Crisis, the Eurozone Debt Crisis, and the COVID-19 pandemic, affect the relationship between public debt and FDI?

Based on these research questions, the study examines the following hypotheses:

- *H1*: The connection between public debt and FDI is generally expected to be inverse, although its magnitude and direction may differ across countries depending on macroeconomic conditions, institutional frameworks, and the characteristics of public borrowing [6]. Theoretically, elevated public debt is expected to discourage FDI by increasing macroeconomic instability and concerns over fiscal sustainability [7]. Such conditions can raise expectations of inflation and currency depreciation,

thereby diminishing the attractiveness of the host economy for foreign direct investment [1]. High public debt may raise expectations of future tax increases, reducing the profitability and attractiveness of foreign investment [8]. Public debt may also reduce FDI through the crowding-out effect, as increased government borrowing raises domestic interest rates and limits private investment [4]. Moreover, excessive debt can increase exchange rate volatility and investment uncertainty, further discouraging foreign investors. The impact of public debt on FDI is expected to vary between the CE-EU-11 and WB-6 economies due to differences in economic development, institutional quality, and macroeconomic stability. While it is argued that moderate and sustainable public debt levels may not deter FDI inflows in advanced economies if borrowed funds are channeled into productive investment (infrastructure, innovation, education, etc.) [8], too high levels of debt may rather undermine investor confidence and perceptions of fiscal sovereignty, future taxation and the prospects for medium-term economic growth. For emerging and transition economies, it is believed that public debt has a more profound negative impact on FDI as high debt levels amplify fiscal and macroeconomic risks (inflation, exchange rate risk, sovereign default risk [9]) which tend to increase investment uncertainty and create a less favorable business climate.

- *H2*: Economic factors as public debt, GDP growth, degree of economy openness and inflation as well as institutional quality are significant FDI determinants [10]. Higher GDP growth attracted more FDI because this indicator measured to the extent of market potential, purchasing power, economic development, infrastructure conditions and human capital. Also, more open economy facilitated FDI inflow because openness Indicator resulted from easier access to international markets, integration into the global supply chains and lower transaction costs [11]. Stable and low inflation attracted FDI while, in the contrary, high and unstable inflations intensified uncertainty, increased costs and negatively affected investment climate [12]. Moreover, stronger institutional quality is expected to promote higher FDI inflows by creating a more favorable investment environment [13].
- *H3*: During major economic crisis episodes, such as the Global Financial Crisis, the Eurozone Debt Crisis, and the COVID-19 pandemic, lower levels of public debt are expected to promote foreign direct investment (FDI) by alleviating financing constraints, strengthening the investment climate, and enhancing international capital mobility [14].

In addressing the research questions, the study first evaluates the extent to which public debt influences FDI. Second, the study empirically estimates the effects of institutional and macroeconomic factors on FDI in the CE-EU-11 and WB-6 regions. Third, it provides policy recommendations that emphasize the role of institutional factors as key drivers of FDI. The concept of the institutional factors' impact is that WB countries are still relatively lagging in terms of upgrading institutional efficiency according to the EU demands, so as to enable them to follow the EU market competition and economic competition accordingly. The paper proceeds with stylized facts on the trends of FDI and public debt in both WB-6 and

CE-EU-11 countries and a literature review, also addressing the research gap. The fourth part describes the model and data. The fifth part describes the econometric framework. The sixth part presents the empirical results, followed by a discussion of the findings. The last part concludes this research work, which summarizes the policy implications.

STYLIZED FACTS

FDI Trends Across the Western Balkans and CE-EU-11

Following the methodology adopted by [15], the descriptive analysis is organized into four separate periods in order to determine the cyclical patterns of FDI in response to different episodes of economic turbulence. The first period, 2000–2008, reflects the pre-Global Financial Crisis (GFC) phase; the second period for the years 2009–2012, captures the Eurozone sovereign debt crisis; the third period is connected to the years 2013–2019, represents the post-crisis recovery and pre-COVID-19 era; while the fourth period, 2020–2023, corresponds to the COVID-19 and post-COVID-19 pandemic period.

Figure 1 depicts the dynamics of inward FDI inflows as a share of GDP across the WB-6 countries through four distinct periods. Montenegro has achieved the highest FDI inflows, mainly during the pre-Global Financial Crisis period (2000–2008) as well as during the Eurozone debt crisis period (2009–2012). Whereas Albania comes in second place with relatively stable FDI performance between the economic crisis period and the recovery period. It is also reflective of the fact that Albania's economy remains resilient to crises and has had a resilient performance to attract FDI compared to other WB-6 countries. On the other hand, Bosnia and Serbia have had less FDI recorded mostly during all periods, but both countries experienced an improvement in their performance between 2013–2023. Kosovo exhibits good performance recording FDI during all periods.

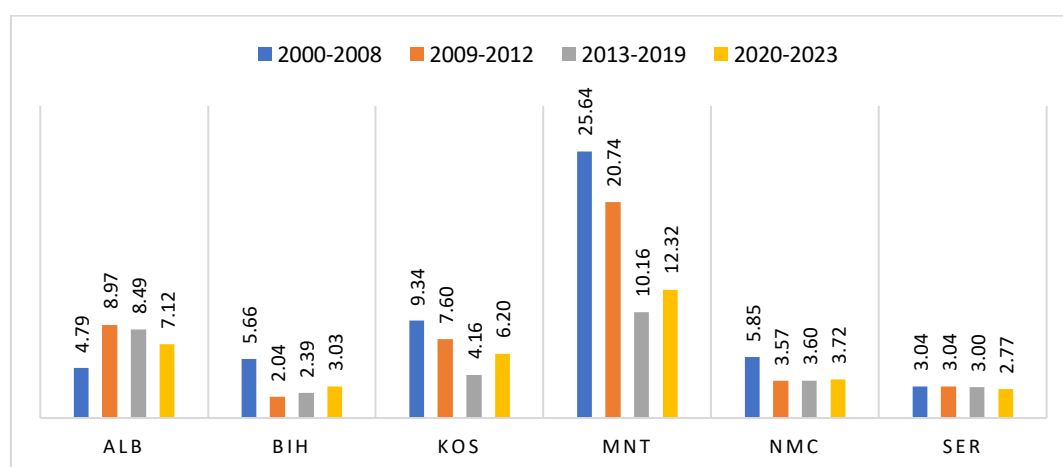


Figure 1. Inward FDI Stock as a Percentage of GDP in the WB-6 Countries.

Figure 2 shows the trends in inward FDI-GDP ratio in the CE-EU-11 countries. From the pre-GFC period, 2000–2007, inward FDI flows maintained an upward trend, indicative of economic transition and the deepening integration of these economies into the European

Union. In the case of most sample countries, accession to the EU spurred FDI inflows encouraged by better institutional environment, greater credibility of the markets, strengthened access to the EU single market. It was also associated with an increase in the import of consumer and capital goods, as well as inflow of foreign capital, which led to better external economic performance and closer convergence with the EU [10].

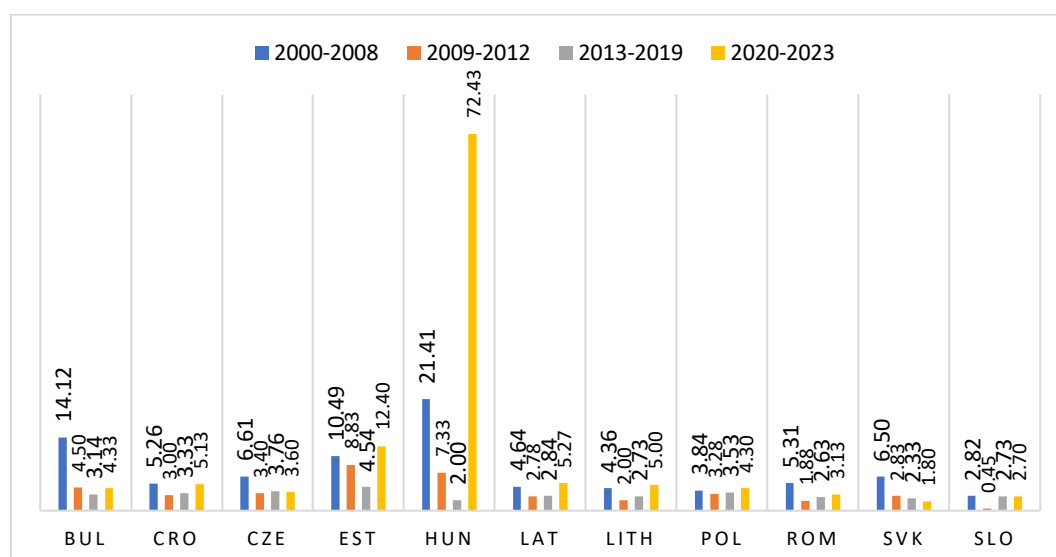


Figure 2. Inward FDI Stock as a Percentage of GDP in the CE-EU-11 countries.

During the Eurozone sovereign debt crisis period (2008–2012), FDI inflows demonstrated an improvement compared with the previous period, and this positive trend continued in the subsequent post-crisis and post-pandemic periods, contributing to stronger external sector performance across the sample countries.

Public Debt Trends in the Western Balkans and CE-EU-11

Public debt is an important fiscal instrument used to support economic growth, finance public investment, and mitigate economic shocks. Its effects depend on how borrowed resources are used: debt directed toward productive investments can enhance long-term growth, while excessive borrowing for consumption or crisis responses may increase fiscal pressures and limit future policy flexibility. Maintaining fiscal sustainability is therefore essential for preserving macroeconomic stability, supporting investment, and promoting long-term economic development [16].

Regarding the public debt criterion, Figure 3 indicates a deterioration in the fiscal position of WB-6 countries, particularly during the COVID-19 period (2020–2023). Public debt-to-GDP ratios exceeded the Maastricht threshold of 60% in several economies, with the highest levels recorded in Montenegro and Albania, followed by Serbia. Although debt ratios stabilized somewhat during 2013–2019, they remained elevated in several countries, reflecting persistent fiscal vulnerabilities. Within the WB-6 group, Montenegro and Albania experienced the most significant increases in public indebtedness during 2020–2023, largely due to crisis-response measures that

intensified fiscal pressures. In contrast, North Macedonia maintained public debt below the Maastricht benchmark throughout the entire period, indicating a relatively stronger fiscal position and greater public finance sustainability compared with other countries in the region.

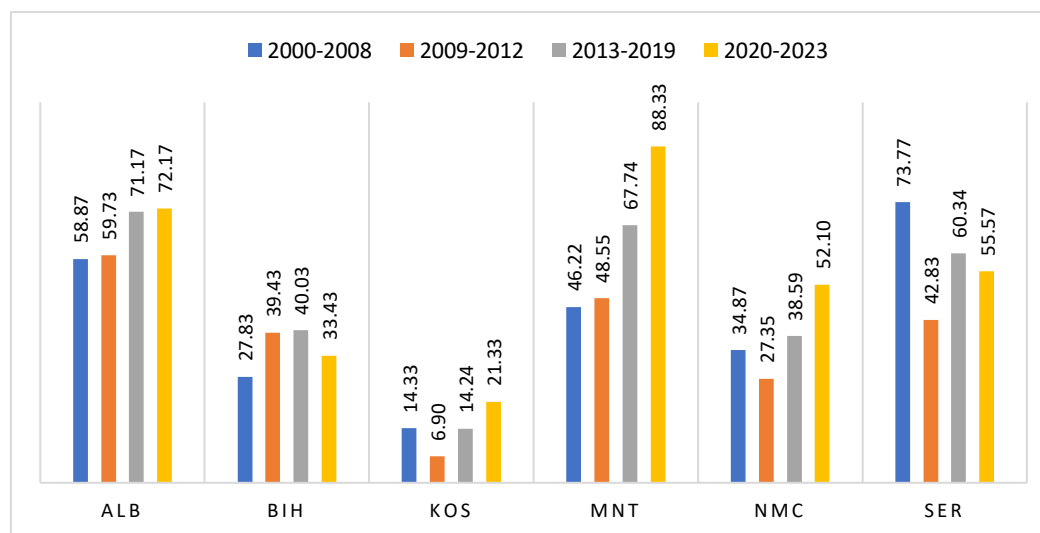


Figure 3. Evolution of General Government Gross Debt as a Percentage of GDP in the WB-6 Countries.

The CE-EU-11 countries experienced a gradual deterioration in public debt indicators, with the most notable increases observed in Croatia, Hungary and Slovenia during and after the COVID-19 pandemic (2020–2023), see Figure 4.

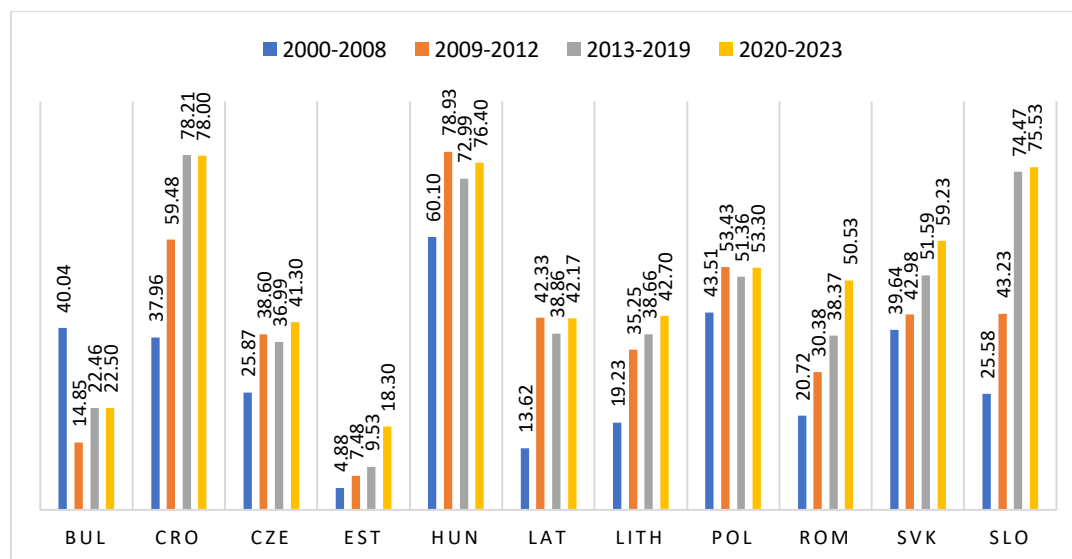


Figure 4. General Government Gross Debt as a Percentage of GDP in Individual CE-EU-11 Countries.

In this period, the debt-to-GDP ratio rose to 78% in Croatia, 76.40% in Hungary and 75.53 in Slovenia, exceeding the Maastricht reference threshold by a considerable margin.

Conversely, the pre-GFC period (2000–2008) was marked by more favorable fiscal conditions across the CE-EU-11 economies, as debt-to-GDP ratios in most countries remained below the 60% limit defined by the Maastricht criteria. Overall, the evidence indicates that repeated economic shocks contributed to a weakening of fiscal sustainability in several CE-EU countries.

LITERATURE REVIEW

Given that one of the ways and main objectives of governments is to attract FDI to improve economic performance and growth in general, a particular emphasis has been placed on dealing with the problem of public debt. But does public debt have an impact on FDI, and how? The evidence is mixed and varies depending on circumstances and events. The authors in [17] have included the data for 39 developing countries over a 5-year average from 1984 to 2010 and investigated whether external debt (that is part of general public debt) affects growth through inward FDI. Their findings showed that external debt constrains economic growth and limits the reaping of the benefits of FDI or the component that is meant to reduce public debt. In other words, high external debt acts as an impeding factor to growth gains from FDI. Going further to the least developed countries, authors in [18] found external debt to have a significant negative impact on FDI. Such a situation acted as a negative indicator to foreign investors who got a negative view about investing in least developed countries.

The authors in [19] reported that both FDI and external debt positively contribute to economic growth, with the growth-enhancing effect of FDI being stronger than that of external debt in developing countries. Similarly, [20] confirmed a significant positive relationship, showing that the growth effects of FDI depend on the level of external debt. These findings served as a justification for governments to go for external financing or borrowing. More recently, [21] applied the ARDL method, with annual observations over the period 1990–2021 for Nigeria, Brazil, and Vietnam. They found evidence that external debt negatively impacts long-term economic growth in these countries and suggested that policymakers should carefully tailor their external borrowing policies by taking into consideration the specific economic/financial situations of each country, the international capital market conditions, as well as the long-term development goals.

The current empirical literature presents inconclusive findings concerning the association between public debt and FDI, with studies identifying both adverse and beneficial effects, depending on the economic background and the channels through which debt influences investment conditions. On the one hand, a negative relationship can be explained by the crowding-out effect, where increased public borrowing and debt-financed government expenditure may reduce the availability of resources for private investment, including foreign investment. Furthermore, high levels of public debt may increase perceptions of fiscal vulnerability, raise sovereign risk, and create uncertainty regarding future taxation, inflation, or macroeconomic adjustment policies, thereby discouraging foreign investors. Additionally, public debt may have a positive effect on FDI

when borrowed resources are allocated toward productive uses, such as infrastructure development, human capital improvement, technological advancement, or other investments that enhance economic capacity. In such cases, public borrowing can contribute to improved business conditions, stronger competitiveness, and greater attractiveness of the host economy for international investors [20, 22, 23]. The conceptual Framework linking Public Debt, Fiscal Risk, Investment Climate, and FDI is outlined in the following figure 5:

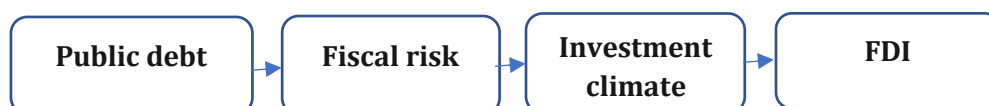


Figure 5. Indirect Effects of Public Debt on Foreign Investment Decisions

This figure outlines the second-round effect of public debt on FDI via fiscal risk and investment climate, where both the direct transmission channel and the mediating role of fiscal risk and investment climate influence FDI.

Previous research that focused on a country or group of countries' findings about the association between public debt and FDI was inconclusive. The authors in [1] have found a significant positive connection between FDI and public debt in African countries, while [17] reported a significant negative relationship. To our knowledge, there has not been any research up to this point focusing on the effect of public debt on FDI between two separate regions (group countries) within Europe, as is the case of transition Western Balkan countries with a well-established EU approximation path vis-à-vis Central East European Union member states. Our study fills a literature gap in this regard by differentiating the impact of public debt on FDI among two regions, the WB region (where five countries are included) and the CE-EU region (where eleven selected countries are included). The public debt FDI nexus model will be examined for each region by differentiating the regions with a dummy variable capturing the focused region, which in our case is CE-EU-11, and the benchmark category of the region, which is the selected WB-6 countries. Additional empirical studies investigating the relationship between public debt, other macroeconomic determinants, and FDI in transition economies are summarized in Table 1.

Table 1. Presented Empirical Studies on Determinants of FDI

Studies	Sample	Methods	Findings	Research gap
[20]	A five-year averaged panel dataset of 39 developing countries from 1984 to 2010.	Threshold regressions	FDI's growth impact depends on external debt levels, as high debt can divert resources from development to debt servicing.	The study examines the debt-FDI-growth relationship but does not explore cross-country FDI interdependence

				or debt-based network effects.
[24]	Sample of 25 countries from Sub-Saharan Africa, spanning from 1990–2017	Fixed Effects and Generalized Method of Moments Approaches for Panel Data Analysis	External debt negatively affects FDI, except when used for infrastructure, while high debt, taxation, low growth, and military spending reduce investor confidence.	The study analyzes debt and macroeconomic determinants of FDI but does not examine cross-country FDI interdependence.
[6]	Sri Lanka, over the period, 1980–2020	Testing approach for ARDL bounds	The study found that domestic debt promotes FDI in the short run but crowds it out in the long run, whereas external debt negatively affects FDI only in the short run.	The study does not explore whether countries with similar debt positions exhibit correlated FDI inflows or whether debt thresholds influence cross-country FDI patterns.
[13]	SEE-5 and Central East EU-10 countries	Fixed Effect and System GMM	The findings show that FDI inflows are driven by gravity factors (distance and GDP), efficiency-related factors (exports and education), and institutional conditions, including WTO membership, transition progress, governance quality, and political stability.	The study does not examine FDI correlation across countries with similar debt levels or fiscal conditions.
[25]	Nigeria	Autoregressive Distributed Lag (ARDL) framework through the years 1981–2016	Domestic debt supports private and public investment, while external debt boosts private investment but reduces public investment; neither significantly affects FDI.	The study focuses on the domestic impact of public debt on investment but does not explore cross-country FDI interdependence or debt-related network effects.
[10]	The study examines six	Fixed effects (FE) and two-	All variables except government effectiveness	The study explains FDI

	SAARC economies — Pakistan, India, Bangladesh, Nepal, Sri Lanka, and Bhutan — during 2000–2020.	stage least squares (TSLs)	significantly affect FDI inflows, highlighting the need for investment-friendly policies to support growth and SDGs.	determinants but does not address cross-country FDI interdependence.
[26]	Euro Area	Pooled Mean Group (PMG) estimation	High sovereign debt reduces growth through its interaction with FDI	Does not analyze determinants of FDI directly
[27]	Bilateral FDI flow data between the 27 EU member countries in 2007	Spatial econometric modeling using a spatial gravity model of bilateral FDI flows for	Countries with similar public debt positions tend to exhibit correlated foreign direct investment (FDI) inflows, with the Maastricht Treaty's 60% public debt threshold playing a significant role.	The study focuses on the interdependence of FDI inflows among countries with similar debt positions, rather than estimating the causal impact of public debt on FDI.
[28]	Balanced panel data set of 46 countries	Two-step System Generalized Panel Methods of Moments (PGMM) regressions with the instrumental variable (IV) technique	The study reveals a dynamic bidirectional link between capital inflows and government debt, with inflows reducing debt and debt showing persistence.	The study does not examine FDI specifically or the roles of debt composition, institutional quality, and debt thresholds in shaping FDI inflows
[29]	Sub-Saharan Africa (SSA) from 1990 to 2017	Mean group ARDL technique and panel Granger causality test	The study finds that FDI boosts domestic investment in the short run, while external debt has limited effects. In the long run, both FDI and external debt crowd out domestic investment, with a unidirectional causal link among the variables.	The study leaves unexplored the extent to which institutional conditions, debt structure, and potential nonlinear debt effects moderate the relationship between external

[30]	75 Emerging Market and Developing Economies (EMDEs)	FGLS and System GMM	Public debt influences FDI mainly through fiscal sustainability and investor confidence. Although high debt is not necessarily harmful, unsustainable debt levels that raise fiscal risk perceptions can deter FDI, while credible and sustainable public finances strengthen investor confidence and attract foreign investment.	debt and FDI inflows. The study does not directly assess the effects of public debt levels, sustainability, and composition on FDI, nor does it examine non-linear debt effects or the moderating role of institutional quality in the debt–FDI relationship.
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Research Gap

The association between public debt and FDI has attracted considerable attention in the empirical economic literature, with numerous studies attempting to identify the mechanisms through which government indebtedness influences the decisions of foreign investors. Nevertheless, despite the extensive body of research on this topic, relatively limited empirical evidence exists regarding the specific experiences of the WB countries and the CE-EU member states. This study addresses an important research gap by examining the role of public debt in determining FDI inflows in the WB-6 and CE-EU-11 countries, which differ in terms of economic transition, institutional development, and exposure to external shocks.

Existing studies on the debt–FDI relationship largely rely on linear and static panel models, assuming a constant and symmetric effect of debt across countries and debt levels. However, these approaches often overlook non-linear dynamics and potential endogeneity issues. To overcome these limitations, this study applies a dynamic panel threshold regression model with endogenous regressors to identify debt thresholds at which the impact of public debt on FDI changes.

The analysis further examines the effects of major economic disruptions, including the Global Financial Crisis (GFC), the Eurozone Debt Crisis, and the COVID-19 pandemic, to assess whether crisis episodes alter the relationship between public debt and foreign direct investment (FDI). Using annual panel data for the period 2000–2023, the empirical framework incorporates key macroeconomic and institutional determinants of FDI, enabling the analysis to capture both long-term structural developments and short-term fluctuations in investment across the WB-6 and CE-EU-11 economies.

MODEL AND DATA

The research will examine the influence of public debt on FDI in WB-6 and CE-EU-11 countries using a yearly panel data set from 2000 to 2023. In relation to our model, the FDI equation can be expressed via equation (1), which is in the reduced form:

$$FDI_{it} = (PD_{it}, GR_{it}, OP_{it}, INS_{it}, CPI_{it}, PD_{it} \times EU_i, FC_t, DC_t, CV_t) \quad (1)$$

Where:

- $i=1, 2, \dots, 17$ is the country index for 17 countries (WB-6 and CE-EU-11 countries)
- $t=1, 2, \dots, 24$ is the time index, counting the period from 2000 to 2023.
- FDI_{it} is the dependent variable denoting the level of inward stock of FDI in the WB-6 and selected CE-EU-11 countries
- PD_{it} serves as the main variable of interest, which is public debt.

Alongside the public debt, the present study utilizes other potential macroeconomic and institutional confounders of FDI. Specifically, GR_{it} , OP_{it} , INS_{it} , CPI_{it} stand for economic growth, trade openness, institutional quality, and inflation. The variable INS_{it} is generated using Principal Component Analysis for the six world governance indicators: control of corruption, political risk, government effectiveness, voice and accountability, and rule of law, all of which are reported in percentile rank values. This measure is used in the study to account for institutional quality and advancement issues (economic and political institutions). Besides the explanatory variables listed in the functional form, the present study also intends to involve dummy variables in the analysis in order to explore the influence of various shocks on FDI inflows. Accordingly, dummy variables have been created to account for the effects of the 2008 global financial crisis FC_t , the Eurozone debt crisis DC_t and the COVID-19 shock CV_t . Moreover, the present study also considers the role of EU membership, by which interacting with public debt to capture the distinguishing effect on FDI flows. Therefore, the EU membership dummy was generated to capture the potential effect. However, the membership dummy would likely induce a time-invariance problem in the estimation procedure. Thus, the interaction term $PD_{it} \times EU_i$ was generated by the multiplication of public debt with the EU dummy to capture the potential distinguishing effect of public debt on FDI between WB and CE-EU countries.

ECONOMETRIC FRAMEWORK

The econometric strategy of this study is designed in a tripartite approach. In the first stage, cross-sectional dependence and the homogeneity of the slope parameters among the variables in the panel data set are analyzed. In conjunction with this, the stationarity of the series is examined in the second stage. Finally, dissimilar to several studies in the empirical literature, the effect of public debt on FDI is scrutinized using a dynamic panel threshold regression, which accounts for the non-linear nature of the relationship and takes into account both the endogeneity of the variables and the phenomenon of reverse causality.

Dynamic Panel Threshold Regression Method

As outlined above, the interplay between public debt and FDI will be investigated by conducting a relatively novel approach pioneered by [31]. Even though FDI inflows are one of the most essential factors that trigger economic development for transition economies, it is also essential to notice that the sample covers both non-EU countries and EU member states. Thus, FDI inflows may exhibit variations across countries. Moreover, the countries in the sample likely show variations in terms of the confounders of FDI flows, which may follow a sporadic tendency. Hence, the interaction between the variables could have a non-linear structure. In addition, endogeneity of regressors and reverse causality issues may stem from the conventional linear panel data models. Accordingly, the present study utilizes the dynamic panel threshold regression with endogenous regressors approach in dealing with the aforementioned issues attached to linear panel data models.

Based on the approach by [29], the methodology introduced by [29] has some advantages. Firstly, the panel fixed effects threshold regression approach by [32] relies on the exogeneity of the regressors. However, the methodology by [31] does not impose such a strict assumption and allows the endogeneity of the regressors. The second issue emerges from the selection and determination of the threshold variable. According to [32], the threshold variable could be unknown or introduced in a theoretical fashion so that it could be estimated through other exogenous variables. Consequently, the threshold value is estimated in tandem with the concomitant parameters of discrete threshold levels [33]. The methodology by [31] is built upon the methodological approach by [32], who integrates two key elements. First, they incorporated the forward orthogonal deviations conversion of the models developed by [34]. In the next step, a cross-sectionally augmented instrumental variable estimation approach pioneered by [33] was carried out. Pursuant to the aforementioned baseline implicit function form, the dynamic panel threshold model representation of the aforementioned functional form is delineated by the following equation (2).

$$FDI_{it} = \mu_i + \beta_1 FDI_{it-1} + \beta_2 PD_{it} I(PD_{it} \leq \gamma) + \beta_3 PD_{it} I(PD_{it} > \gamma) + \beta_4 GR_{it} + \beta_5 OP_{it} + \beta_6 INS_{it} + \beta_7 CPI_{it} + \beta_2 PD_{it} \times EU_i + FC_t + DC_t + CV_t + \varepsilon_{it} \quad (2)$$

Conforming to the procedures outlined by [31], it is conjectured that regime-dependent variables and threshold variables are congruent in each specification. Accordingly, μ_i stands for the country fixed-effects, whereas $I(\cdot)$ is defined as the indicator function, which is determined by the threshold variable and threshold values (γ).

In order to estimate the previously mentioned model specifications, [31] proposed a bipartite strategy. The initial phase of the estimation process involves the elimination of the country fixed effects from the baseline model specification. In this regard, [31] adopted the approach pioneered by [34], advocating for the utilization of the onward orthogonal deviations conversion to remove the country fixed effects. The primary advantage of this methodology is that it reduces the serial correlation present in the converted disturbance

terms. The derivation of the converted disturbance terms depends on the subtraction of the mean of all available future observations of a specific variable from each observation [35].

In the ensuing stage, the model is estimated by employing least squares for a specified threshold, where endogenous regressors are substituted by their estimated values from the initial-stage regression [31]. Following the determination of the optimal threshold, the gradient coefficients of the regressors are estimated. The GMM estimator is then applied with the selected instrumental variables and threshold values derived from the previous stage [36].

EMPIRICAL RESULTS

Pre-Testing and Stationarity Check

The initial empirical stage applies diagnostic tests to assess slope homogeneity and cross-sectional dependence in the panel data. Table 2 presents the results, with Panel A reporting the Pesaran test for cross-sectional dependence among the sampled countries. The test statistics for all specifications are highly significant at the 1% level, overwhelmingly rejecting the null hypothesis of no cross-sectional dependence. The findings imply that the variables are cross-sectionally correlated; therefore, a macroeconomic shock or a shift in remittance flows originating in one of the sampled LAC countries is highly likely to spill over to the others due to their regional and economic integration. Panel B outlines the outcomes of the slope homogeneity test by [37].

Table 2. Panel Data Pre-Testing Results

A-Cross Sectional Dependency			
Tests	Statistics	p-values	Outcome
Pesaran CD Test	18.856*	(0.000)	CD exists
Pesaran CD _{LM} Test	25.761*	(0.000)	CD exists
B-Slope Homogeneity			
Tests	Statistics	p-values	Outcome
PY Δ Test	5.122*	(0.000)	Heterogeneity
PY Δ -adjusted Test	6.086*	(0.000)	Heterogeneity

Notes: PY stands for Pesaran and Yamagata (2008) tests. P-values are shown in parentheses for each test. *denotes the 1% significance level.

Similar to the cross-sectional dependency results, both the Δ (Delta) and Δ -adjusted test statistics are statistically significant at the 1% level across the baseline model specifications.

Consequently, the null hypothesis of slope homogeneity is firmly rejected. This indicates that the slope parameters are heterogeneous, meaning the impact of remittance inflows and other potential confounders on economic sophistication is not uniform across the different countries in the panel. This heterogeneity necessitates the use of second-generation panel data estimators that can account for country-specific differences.

In the context of time series, the presence of a unit root in the series under consideration can potentially influence the results of subsequent analyses. This phenomenon, in particular, has the potential to introduce issues such as spurious regression. Although this is an essential aspect for time series analysis, it is also pertinent to macro panel data. In this

regard, the cross-sectionally augmented IPS (CIPS) test, which was pioneered by [38], is feasible under the presence of CD and slope heterogeneity conditions. Known as the second-generation unit root test, the results of the CIPS test are reported in Table 3.

Table 3. CIPS Panel Unit Root Test Results

Level	1 st Difference				Decision
Variables	Constant	Constant+Trend	Constant	Constant+Trend	
FDI_{it}	-3.602*	-4.218*	-5.697*	-5.793*	I (0)
PD_{it}	-3.171*	-2.804***	-4.167*	-4.452*	I (0)
GR_{it}	-4.209*	-4.188*	-5.726*	-5.792*	I (0)
OP_{it}	-1.713	-2.192	-4.133*	-4.165*	I (1)
INS_{it}	-2.254***	-3.201*	-4.745*	-4.779*	I (0)
CPI_{it}	-4.329*	-4.725*	-5.213*	-5.283*	I (0)
Critical Value					
	10%	5%	1%		
Level (Constant)	-2.11	-2.2	-2.38		
Level (Constant+Trend)	-2.63	-2.72	-2.88		
1 st Difference (Constant)	-2.11	-2.2	-2.38		
1 st Difference (Constant+Trend)	-2.63	-2.72	-2.38		

Notes: * and *** denotes the significance levels at 1% and 10% respectively.

The results clearly indicate that the null hypothesis of a unit root is rejected at levels for all the variables with the exception of trade openness (TO_{it}). Nonetheless, upon taking the first differences of the series, the test statistics for trade openness alongside the other variables become highly significant, confirming that they are stationary and integrated of order one.

Dynamic Panel Threshold Regression Results

This section of the study is devoted to the discussion of the findings and their economic interpretations that are obtained in the context of examining the impact of public debt on FDI inflows utilizing the dynamic threshold regression approach. In the initial stage, the presence of a threshold effect was investigated for each specification, and the relevant results are reported in Table 4.

The significance of the regimes was tested under the null hypothesis of no threshold effect ($\beta_1 = \beta_2$). According to the results, the null hypothesis of no threshold effect is rejected for each specification, since the computed test statistics exceed the critical values at 1% and 5% significance levels. On the other hand, panel B displays the threshold parameter estimates. In this regard, the results demonstrate that the threshold variable PD_{it} for each specifications exert the presence of a single threshold, which lies between the upper and lower bounds. Accordingly, it could be inferred that public debt interacts with FDI inflows in a non-linear fashion in each regime.

Table 4. Threshold Effect Tests

A-Threshold Effect Tests								
H ₀ : No threshold effect ($\beta_1 = \beta_2$) H ₁ : Threshold effect exists ($\beta_1 \neq \beta_2$)								
Threshold Variable:	(1)		(2)		(3)		(4)	
PD_{it}								
Coefficient	14.6693*		5.6577**		10.1621**		6.8864*	
Bootstrap standard error	1.4499		2.7505		3.9554		2.2866	
Normal Based CI	{11.8275-17.5112}		{0.2668-11.0486}		{2.4096-17.9147}		{2.4047-11.3682}	
B-Threshold Parameter Estimates								
	(1)		(2)		(3)		(4)	
	<u>LB</u>	<u>UB</u>	<u>LB</u>	<u>UB</u>	<u>LB</u>	<u>UB</u>	<u>LB</u>	<u>UB</u>
Threshold Bounds	14.76	72	14.96	71.7	14.7	72.1	14.8	71.9
Threshold	69.1		69.9		69.2		69.5	
Parameter								

Notes: *, **, *** denote the significance levels at 1%, 5%, and 10%, respectively. LB, UB, and CI stand for lower bound, upper bound, and confidence intervals, respectively.

After confirming the existence of a threshold effect, the final step is to estimate the dynamic panel threshold regression model. Table 5 presents the estimation results. In this section, we present the empirical results. To this end, Panel A of Table 5 displays the estimation results regarding the threshold variable. When public debt exceeds the estimated threshold, the coefficient is negative across all models (ranging from -0.0173 to -0.1502) and statistically significant in Models 2, 3, and 4. These findings suggest that high public debt discourages FDI by increasing perceptions of macroeconomic instability and future tax pressures. Notably, even below the estimated threshold, public debt maintains a negative and statistically significant effect across all models, with coefficients ranging from -0.0604 to -0.2116.

The results show that public debt harms FDI regardless of the threshold level, with a stronger impact below the estimated threshold, indicating a persistent crowding-out effect in the WB and CE-EU transition economies. The positive and significant lagged FDI coefficient confirms strong persistence, suggesting that existing foreign investment encourages future inflows.

Economic growth has a limited and non-robust effect on FDI, while trade openness remains statistically insignificant across all models. In contrast, institutional quality significantly promotes FDI, highlighting the importance of effective governance, rule of law, and corruption control. Inflation also shows a positive association with FDI, possibly reflecting stronger economic activity rather than macroeconomic instability in these economies.

As outlined above, the purpose of this paper is to capture the distinguishing effects of shocks on FDI flows. In this context, the impact of the global financial crisis, the Eurozone debt crisis, and the COVID-19 pandemic are analyzed by generating their respective dummy variables. Except for the COVID-19 pandemic, macroeconomic and financial distortions adversely influence FDI flows for the countries in the sample. The dummy for the pandemic period is positive but statistically insignificant in Models 3 and

4. This suggests that, after controlling for dynamic factors, the COVID-19 shock does not have a statistically significant independent effect on FDI within the specified threshold model. On the other hand, the dummy for the global financial crisis is negative and highly significant in Models 3 (-3.9186) and 4 (-2.1808). The 2008 global financial turmoil had a severe and direct detrimental impact on FDI inflows into these regions. Similarly, the influence of the Eurozone debt crisis on FDI flows is negative and highly significant in Models 3 (-2.0313) and 4 (-3.9423). The European sovereign debt crisis created significant uncertainties that discouraged foreign capital accumulation in both WB and CE-EU countries.

Table 5. Dynamic Panel Threshold Model Estimation Results

A-Threshold Variables Estimates				
	(1)	(2)	(3)	(4)
$PD_{it,above}$	-0.0173 (0.0318)	0.0831*** (0.0472)	-0.0813*** (0.0494)	-0.1502*** (0.0885)
$PD_{it,below}$	-0.0604*** (0.0326)	-0.1296*** (0.0672)	-0.1391*** (0.0769)	-0.2116*** (0.1210)
B-Coefficient Estimates				
FDI_{it-1}	0.4648* (0.0147)	0.4540* (0.0166)	0.4581* (0.0172)	0.4465* (0.0207)
GR_{it}	0.0246 (0.0226)	0.0345*** (0.0215)	-0.0174 (0.0368)	-0.0100 (0.0355)
OP_{it}	-0.0448 (0.0673)	-0.0487 (0.0694)	0.0013 (0.0318)	-0.0025 (0.0355)
INS_{it}	0.0361 (0.0218)	0.0976 (0.5215)	0.7897*** (0.4787)	0.8757*** (0.5051)
CPI_{it}	0.0223 (0.5792)	0.3394** (0.1697)	0.5702** (0.2754)	0.6040** (0.2970)
$PD_{it} \times EU_{it}$		0.1333*** (0.0782)		
CV_t			5.7835 (5.3571)	5.6477 (5.2690)
FC_t			-3.9186** (1.9233)	-2.1808** (1.0528)
DC_t			-2.0313** (0.9611)	-3.9423** (1.9203)

Notes: *, **, *** denote the significance levels at 1%, 5%, and 10%, respectively. Standard errors are shown in parentheses.

The impact of EU membership on FDI flows is observed indirectly by interacting the EU dummy with public debt, since the dummy for EU membership induces omitted variable bias due to its time-invariant nature. Accordingly, a new variable $PD_{it} \times EU_{it}$ was generated by multiplying the EU dummy with public debt PD_{it} . The findings demonstrate that the coefficient of the interaction term is positive and significant in Model 2 (0.1333). This indicates that EU membership (represented by the CE-EU-11 benchmark) reduces the

negative impact of public debt on FDI. EU membership likely provides a credibility anchor, meaning foreign investors are more tolerant of public debt in CE-EU countries compared to non-EU Western Balkan countries.

Additionally, Table 6 presents the diagnostic test statistics from the estimation of dynamic panel threshold regression with endogenous regressors. The results of the Wald tests show a highly significant tendency across all models, confirming that the explanatory variables jointly and significantly explain the variations in FDI. To detect the presence of serial correlation, an autoregressive (AR) test was performed. Accordingly, the AR (1) test is significant (p-values around 0.05-0.06), and the AR (2) test is insignificant (p-values > 0.31), meeting the required condition for dynamic panel models by proving that there is no second-order serial correlation in the error terms.

Table 6. Diagnostic Test Results

Tests	(1)	(2)	(3)	(4)
Wald χ^2	198.89*	161.54*	304.48*	323.33*
AR (1)	-1.8318*** (0.0670)	-1.849*** (0.0645)	-1.9249*** (0.0542)	-1.9551*** (0.0506)
AR (2)	-1.0040 (0.3154)	-1.0086 (0.3131)	-0.9424 (0.3459)	-0.9479 (0.3432)
Sargan Test (χ^2)	37.0689 (0.4195)	35.6372 (0.4383)	21.9679 (0.9283)	21.5089 (0.9199)

Notes: *, *** denote the significance levels at 1% and 10%, respectively. The brackets show the standard errors for each test.

Additionally, the validity of the instrumental variables is examined by conducting Sargan's test for overidentifying restrictions. The results underline the presence of high p-values (ranging from 0.4195 to 0.9283), meaning that the null hypothesis cannot be rejected. This validates the instruments used in the model, confirming they are exogenous and that the model is not over-identified.

Robustness Check

To In order to substantively test the empirical stability and consistency of the dynamic panel threshold regression estimates, a rigorous sensitivity test was also performed on the (globally) weighted models. In this robustness check, the model was estimated by excluding the COVID,19 pandemic-affected timeframe (2020–2022) as a sample-sensitivity test whether the baseline parameter estimates were unwittingly computationally inflated by recent years of global supply chain destruction and abnormal post-pandemic fiscal bedlam.

Moreover, a vital statistical specification test was also performed on this robustness specification. Contrary to the baseline models in Table 5, which examined the moderating effect of EU accession using the introduction of interaction variables, the baseline models purposely omit the interaction vectors to statistically abrogate the risk of collinearities between the debt-in fidget threshold-regressors and the interaction term. It ultimately provided a more intuitively straightforward lens by which to purely verify the structural

threshold effect. The baseline structural crisis dummies of FC and DC which directly absorb the impact of exogenous macroeconomic shocks are employed instead.

Prior to analyzing the estimation outcomes, the threshold effects test is conducted to verify the existence of threshold effect, and the results are summarized in Table 7. Consequently, the empirical model proves to be non-linear in structure. First, from the estimated bootstrap standard errors and bootstrap confidence intervals reported in Table 7 the null hypothesis "no threshold effect" are rejected strongly in both specifications. In particular, the threshold effects tests supply significant statistical evidence for both the with crisis dummy model as well as the baseline estimate model. As a result, the findings of the econometric tests further suggest that public debt has a non-linear effect on FDI inflow in general. Moreover, it also leads to the conclusion that debt accumulation under sovereignty populates an asymmetric crowding-out effect to foreign investors in various macroeconomic regimes.

Table 7. Robustness Check: Threshold Effect Tests

A-Threshold Effect Tests				
H ₀ : No threshold effect ($\beta_1 = \beta_2$) H ₁ : Threshold effect exists ($\beta_1 \neq \beta_2$)				
Threshold Variable: PD_{it}	(1)		(2)	
Coefficient	10.1636**		5.5568 *	
Bootstrap standard error	5.1424		1.5952	
Normal Based CI	{0.0845-20.2426}		{2.4302-8.6835}	
B-Threshold Parameter Estimates				
	(1)		(2)	
	<u>LB</u>	<u>UB</u>	<u>LB</u>	<u>UB</u>
Threshold Bounds	14.1	69.5	14.5	70.0
Threshold Parameter	17.2		17.5	

Notes: *, **, *** denote the significance levels at 1%, 5%, and 10%, respectively. LB, UB, and CI stand for lower bound, upper bound, and confidence intervals, respectively.

Table 8 shows the results of estimation for this new robustness specification. The results show that the baseline structural dynamics are very robust, although there are subtle differences from the results in Table 5 with important implications for economic interpretations. Firstly, the above results (Table 5) introducing the crisis dummies reveal that the major shocks depress the FDI inflows severely and significantly, as indicated by the coefficients for the debt crisis and the financial crisis.

Crucially, once the noise of the potential multicollinearity in the interaction term has been eliminated and these structural shocks extracted, the true magnitude of the effects of the public debt threshold is much more transparent. Table 8 shows that even once these structural shocks are estimated and extracted, public debt remains a statistically significant negative factor in inward FDI stock both below and above the structural threshold. Compared to the baseline model (Table 5), the magnitude in the lower debt regime of the public debt effect is significantly larger and the negative impact increased. Economically, this suggests that when external crisis shocks are properly ruled out, the early stages of debt accumulation act as an even stronger early-warning signaling mechanism for foreign

investors. It validates the asymmetric crowding-out hypothesis: initial increases in public debt create severe risk aversion and deter foreign capital long before debt reaches extreme levels. Conversely, once the threshold is breached, the marginal negative impact diminishes, likely because the macroeconomic risks have already been priced in by the investors.

Table 8. Robustness Check: Dynamic Panel Threshold Regression (Excluding COVID-19)

A-Threshold Variables Estimates		
	Baseline	With crisis dummies
$PD_{it,above}$	-0.0541*** (0.0319)	-0.1810** (0.0707)
$PD_{it,below}$	-0.2486* (0.0884)	-0.0672*** (0.0367)
B-Coefficient Estimates		
FDI_{it-1}	0.5791* (0.0650)	0.5967* (0.0639)
GR_{it}	0.0416** (0.0211)	0.0077 (0.0224)
OP_{it}	0.0561 (0.0484)	0.0635 (0.0495)
INS_{it}	0.8021 (0.7356)	1.2176 (0.8078)
CPI_{it}	0.1422 (0.1001)	0.3092** (0.1430)
FC_t		-2.7791** (1.2517)
DC_t		-1.6335* (0.4780)
C: Diagnostic testing		
Wald χ^2	730.98*	1136.62*
AR (1)	-2.4629** (0.0138)	-2.5112** (0.0120)
AR (2)	-0.0339 (0.9729)	-0.0126 (0.9899)
Sargan Test (χ^2)	147.89 (0.7958)	137.49 (0.9102)

Notes: *, **, *** denote the significance levels at 1%, 5%, and 10%, respectively. Standard errors are shown in parentheses. For the diagnostic tests, the parentheses stand for the p-values for AR tests, whereas the brackets show the p-values for Sargan tests.

Among the control variables, macroeconomic stability (CPI) and institutional quality (INS) retain their expected signs, though institutional quality loses its statistical significance in the presence of dominant crisis dummies. Growth exerts a strongly

significant positive effect in the baseline specification of Table 8, reinforcing the market-seeking nature of FDI.

Finally, the dynamic properties of the estimations strongly satisfy all standard econometric criteria. The dynamic persistence of FDI is highly significant, captured by the lagged dependent variable. As reported in Panel C, the Wald χ^2 statistics confirm the overall joint significance of the models. The Arellano-Bond tests for serial correlation show the expected first-order negative autocorrelation, while the non-significant AR (2) test results formally reject the presence of second-order serial correlation. Moreover, the p-values of Sargan test (0.7958 and 0.9102) are well above the conventional significance levels, confirming the validity of the instrumental variables and indicating no over-identification problems. Together, these diagnostic checks validate the overall structural stability and econometric reliability of our revised analytical framework.

DISCUSSION

The empirical analysis points to a clear and consistent negative relationship between public debt and inward FDI across the sampled Western Balkan and CE-EU countries. What stands out from the dynamic panel threshold regression method, however, is the nonlinear nature of this relationship. Interestingly, it is documented that the crowding-out effect of public debt is actually more severe when the debt level is below the structural threshold (roughly 69% to 72% of GDP) than when it exceeds it.

For these transition economies, even relatively modest increases in public debt appear to signal heightened macroeconomic vulnerability to foreign investors, intensifying concerns regarding future tax burdens, fiscal sustainability, and exchange rate stability well before debt levels approach conventional critical thresholds. Notably, the estimated negative effect is systematically stronger when public debt is below the threshold (ranging from -0.0604 to -0.2116) than when it exceeds it (ranging from -0.0173 to -0.1502).

This counterintuitive result can be interpreted through several mechanisms characteristic of transition economies. First, in emerging and transitioning markets, initial debt accumulation functions as a salient signaling mechanism for foreign investors. Even moderate increases in sovereign borrowing may be perceived as early indicators of fiscal weakening, thereby heightening expectations of future taxation, macroeconomic instability, and currency depreciation. As a result, investment decisions are adjusted downward prior to the attainment of standard debt sustainability thresholds. Second, once public debt surpasses the estimated structural threshold (approximately 69–70% of GDP), a substantial portion of fiscal risk is already internalized by investors. Consequently, while additional debt continues to exert a negative influence on FDI, its marginal effect diminishes. Third, at higher debt levels, governments often channel borrowed funds into infrastructure, public investment, or crisis-management expenditures, which may partially offset crowding-out effects by enhancing productive capacity and improving the overall investment climate.

Conventional macroeconomic theory typically regards inflation as a proxy for macroeconomic instability and weak monetary discipline, implying a negative association with foreign direct investment. However, the dynamic threshold results indicate a statistically significant positive coefficient for CPI_{it} across Models 2–4, with estimates ranging from 0.3394 to 0.6040. In the context of the examined transition economies, this finding is consistent with a demand-pull expansion mechanism. During convergence phases, moderate inflation frequently coexists with robust GDP growth, expanding nominal market size and strengthening domestic demand. Market-seeking multinational enterprises may interpret such inflationary dynamics as evidence of strong consumption growth and improved profit opportunities, enabling firms to sustain pricing power and achieve higher nominal returns. In addition, since inward FDI is expressed as a share of GDP, periods of rapid economic expansion and structural transformation may also generate valuation effects that contribute to the observed positive relationship.

Beyond macroeconomic fundamentals, institutional quality emerges as a central determinant of foreign investment. The dynamic threshold estimates indicate that stronger institutional performance (INS_{it}) has a significant positive impact on FDI inflows, particularly during periods of heightened global uncertainty. This result is especially pertinent for the WB-5 countries. As noted in [25] in the context of least developed economies, countries with weaker economic performance and limited regional integration often face persistent transition inefficiencies that constrain foreign investment. Improvements in institutional quality—particularly in the rule of law, government effectiveness, and regulatory quality—can therefore enable Western Balkan economies to overcome structural impediments that continue to limit their FDI performance relative to CE-EU counterparts.

The findings further underscore the exposure of these economies to major external shocks. Both the 2008 global financial crisis and the Eurozone sovereign debt crisis significantly reduced FDI inflows by amplifying uncertainty and weakening investor confidence. At the same time, the results highlight the stabilizing role of European Union membership. The positive interaction between EU membership and public debt suggests that investors exhibit greater tolerance toward higher debt levels in CE-EU countries than in non-EU Western Balkan economies. Accordingly, EU membership operates as a credibility-enhancing anchor, strengthening institutional trust and policy reliability while mitigating the adverse effects of public debt on foreign direct investment.

SUMMARY AND CONCLUSION

This study examines the relationship between public debt and FDI in the WB-6 and CE-EU-11 economies during 2000–2023 using a dynamic panel threshold regression approach. The findings reveal a persistent negative effect of public debt on FDI, with the strongest adverse impact occurring below the estimated threshold, suggesting that even moderate debt accumulation may signal fiscal risks and future tax pressures to foreign investors.

The results also show that major external shocks, particularly the Global Financial Crisis and the Eurozone sovereign debt crisis, significantly reduced FDI inflows. In contrast, the COVID-19 shock did not create a significant independent structural break. Institutional quality and EU integration emerge as important factors mitigating fiscal risks. Strong institutions enhance investment attractiveness, while EU membership provides a credibility advantage that reduces the negative impact of public debt on FDI. These findings highlight the need for WB-6 countries to strengthen institutional quality and governance frameworks to improve their ability to attract foreign investment.

Enhancing good governance and efficient institutions are absolutely critical to offset their structural vulnerabilities and attract foreign capital. Furthermore, policymakers in both regions need to approach fiscal policy with caution. Since the crowding-out effect of public debt is triggered well before debt reaches extreme highs, relying on debt-financed public expenditure to stimulate the economy may inadvertently discourage the FDI required for long-term growth and successful economic convergence.

NOMENCLATURE

ARDL	Autoregressive Distributed Lag
AR(1)	First-Order Autoregressive Process
AR(2)	Second-Order Autoregressive Process
CE-EU-11	Central and Eastern European EU-11
CI	Confidence Interval
CPI	Inflation
CV	COVID-19 Shock Dummy
DC	Eurozone Debt Crisis Dummy
EMDEs	Emerging Market and Developing Economies
EU	European Union
FC	Financial Crisis Shock Dummy
FDI	Foreign Direct Investment
FE	Fixed Effects
FGLS	Feasible Generalized Least Squares
GFC	Global Financial Crisis
GMM	Generalized Method of Moments
GR	Economic Growth
INS	Institutional Quality Index
IV	Instrumental Variable
PD	Public Debt
PD × EU	Public Debt–EU Membership Interaction
PGMM	Panel Generalized Method of Moments

PMG	Pooled Mean Group
SAARC	South Asian Association for Regional Cooperation
SDGs	Sustainable Development Goals
SEE	Southeast European Countries
TSLs	Two-Stage Least Squares
WB-6	Western Balkan Six
WTO	World Trade Organization
β_1, β_2	Regression Coefficients
$I(\cdot)$	Indicator Function
χ^2	Chi-Square Statistic
γ	Threshold Value
μ_i	Country Fixed Effects

AUTHOR CONTRIBUTIONS

"Conceptualization, B.D. and D.K.; Methodology, B.D. and O.Ç.; Validation, B.D., D.K. and R.F.; Investigation, B.D.; Resources, D.K.; Data Curation, R.F.; Writing – Original Draft Preparation, B.D. and D.K.; Writing – Review & Editing, B.D. and O. Ç.; Visualization, D.K.; Supervision, B.D.; Project Administration, B.D.

CONFLICT OF INTERESTS

The authors confirm that there is no conflict of interest associated with this publication.

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