

Stojan JankovićNational Bank of Serbia
Economics Research and Statistics
Department**Emilija Janković**National Bank of Serbia
Economics Research and Statistics
Department**Dragan Dživdžanović**National Bank of Serbia
Economics Research and Statistics
Department**Jovan Purčić**National Bank of Serbia
Economics Research and Statistics
Department

THE IMPACT OF UNCERTAINTY ON FOREIGN DIRECT INVESTMENT INFLOWS IN THE CENTRAL AND EASTERN EUROPE REGION

Uticaj neizvesnosti na priliv stranih direktnih investicija u regionu srednje i istočne Evrope

Abstract

The paper's findings confirm that, alongside macroeconomic fundamentals, uncertainty represents an important determinant of international investment flows. This paper examines the impact of global uncertainty on FDI flows in Central and Eastern European countries during the observed period Q1 2015 – Q1 2025. As a measure of uncertainty, we used the World Uncertainty Index (WUI), constructed by the research unit of the renowned British magazine *The Economist*. The WUI enables comparable and frequent monitoring of uncertainty at both the global and country levels. Empirical analysis, conducted using a dynamic panel model with fixed effects, shows that an increase in the WUI significantly reduces FDI inflows in a group of 11 countries in the region. This effect is even more intense in a subgroup of four countries that, in addition to global shocks, were simultaneously exposed to specific internal socio-political crises over the past one to two years.

Keywords: *global and local uncertainty, WUI, FDI inflows, dynamic panel model.*

Sažetak

Nalazi rada potvrđuju da, pored makroekonomskih fundamenata, neizvesnost predstavlja važnu determinantu međunarodnih investicionih tokova. Rad ispituje uticaj globalne neizvesnosti na tokove SDI u zemljama srednje i istočne Evrope u periodu T1 2015 – T1 2025. godine. Kao merilo neizvesnosti korišćen je pokazatelj *WUI* (*World Uncertainty Index*) koji je konstruisala istraživačka jedinica uglednog britanskog časopisa *The Economist*. *WUI* omogućava uporedivo i učestalo praćenje neizvesnosti kako na globalnom nivou tako i po zemljama. Empirijska analiza, sprovedena primenom dinamičkog panel-modela s fiksnim efektima, pokazuje da porast *WUI* znatno smanjuje priliv SDI u grupi od 11 zemalja regiona, pri čemu je taj efekat još intenzivniji u grupi od četiri zemlje koje su, pored globalnih potresa, istovremeno bile izložene i unutrašnjim društveno-političkim krizama u skorije vreme.

Ključne reči: *globalna i lokalna neizvesnost, WUI, priliv SDI, dinamički panel-model.*

Introduction

Global uncertainty, which has increased sharply over the past decade due to multiple and interconnected crises – from Brexit and custom barriers between the US and China to the pandemic, wars and geopolitical and trade tensions – has become one of the key factors shaping FDI flows. For developing and emerging countries, which are largely reliant on foreign capital inflows, the effects of heightened uncertainty are often more pronounced than in developed countries. Theoretical models, from the eclectic paradigm to real options theory, which emphasizes the value of delaying investment under conditions of high uncertainty, show that investors in such circumstances resort to a “wait-and-see” strategy. Investments are delayed, scaled down, or redirected to more stable destinations, which particularly affects small and open economies. Consequently, measuring uncertainty has become an important part of modern economic analysis and forecasts.

While earlier approaches were limited to indicators such as market volatility or survey expectations, more representative indicators, such as the WUI (World Uncertainty Index) published by the research unit of the renowned British magazine *The Economist*, enable a more comprehensive view of uncertainty dynamics on a global and local level as well. The WUI is based on textual analysis of reports for over 140 countries, thereby allowing for the monitoring of uncertainty in real time and the identification of trends that can be of crucial importance for investors and economic policymakers. In this research, WUI was used as a common measure of uncertainty for 11 countries in the Central and Eastern Europe (CEE region) during the period Q1 2015 – Q1 2025. Conducting a dynamic panel model with fixed effects, the results confirm the hypothesis derived from the theoretical framework that increased uncertainty significantly reduces current FDI inflows. The effect is particularly pronounced in four countries of the region that, in addition to global shocks, have been exposed to specific internal socio-political crises over last one to two years, confirming the importance of uncertainty as a decisive factor in international capital flows.

Theoretical Research Framework

The Concept of Foreign Direct Investment in Economic Theory and Practice

The growing influx of FDI in the second half of the 20th century prompted researchers to seek explanations for this phenomenon. Initial explanations assumed perfect markets, which proved wrong because FDI, by its nature, arises as a response to market imperfections – transaction costs, information asymmetries, and imperfect competition. Over time theories began to incorporate the specificities of the market structures in which they operate [3] to explain differences in FDI dynamics across economic sectors. A microeconomic approach prevailed, according to which the characteristics of the firms themselves determine their entry into foreign markets via FDI, despite numerous barriers such as cultural differences, the regulatory environment, technical standards, and specific consumer preferences. Theories of industrial organization and internalization became particularly prominent and were later synthesized into the eclectic paradigm called OLI (stands for Ownership – Location – Internalization), which subsequently also incorporated the locational approach [21], [22]. The OLI framework thus provides a comprehensive explanation by identifying three simultaneous conditions for FDI: firm-specific ownership advantages, locational advantages of host countries, and the benefits of internalizing transactions rather than using external markets. This means that, in addition to the diverse motives of companies – such as resource exploitation, market-seeking, increased operational efficiency, or strategic asset-seeking – one must also consider the advantages offered by the location itself, i.e., economic geography [32]. In parallel with that, the Lucas paradox emerged, which highlights the expectation that capital from developed countries would flow to a greater extent towards less developed countries, where potential returns are higher [31], yet this rarely happens in practice. One of the key reasons cited for this is the factor of uncertainty, which stems from institutional settings and the risk of appropriation of returns, potential changes in economic policy regarding taxation or nationalization procedures, as well as information asymmetries in contract formation.

The combination of the microeconomic and locational approaches to foreign investment enables a more complete analysis of investor decisions under uncertainty. As these decisions represent a strategic aspect of large company operations, their outcome crucially depends on the context in which they are made. Traditional investment theory, with net present value (NPV) at its foundation, depends on the problematic assumptions of perfectly predictable returns and complete certainty about future market conditions. However, in practice, investments have proven to be often irreversible and exposed to institutional and market uncertainty [20]. This inherent limitation prompted the development of real options theory, which treats investment as a deferrable decision that creates the right, but not the obligation, to commit resources after uncertainty resolution [36]. This theory explains why companies under conditions of increased market and/or political uncertainty often adopt a “wait-and-see” strategy. In FDI, this behavioural pattern is particularly pronounced because investors, in addition to specific risks, also face additional uncertainty associated with insufficient knowledge of foreign markets. Although exposed to information asymmetry, foreign investors have greater flexibility in choosing between multiple destinations for investing. If they assess that the systemic risk in one country is too high, they can redirect capital to another country. However, the key determinant of FDI inflows remains the strength of the destination country’s fundamentals, making them the primary area of focus for policymakers aiming to enhance the positive effects of FDI [33]. Although the countries in the CEE region act as both sources and destinations of FDI, they are more frequently recipients of FDI inflows than sources of FDI outflows [34].

During the process of globalization and the reduction of economic and financial barriers, FDI has become a significant form of investment, particularly for small, open economies integrating into global value chains. However, recent geoeconomic fragmentation and supply chain reconfiguration have added new layers of uncertainty to FDI decisions, particularly for export-oriented economies [2]. It is therefore essential to examine how foreign investors make capital allocation decisions in the environment of

heightened uncertainty. Such uncertainty triggers loss aversion and the consideration of negative scenarios, which can lead to capital flight from markets perceived as riskier for investment. Research shows that increased political or social instability typically results in a decline in overall capital inflows, for instance, during electoral cycles [27]. On the other hand, investors may view short-term socio-political crises as temporary obstacles, thus their negative impact on FDI inflows may be limited. Consequently, understanding the diverse sources and forms of uncertainty is crucial for analysing investment dynamics in the CEE region. Recent empirical studies confirm that institutional quality and geopolitical factors have become increasingly significant determinants of FDI distribution within the European transition countries [9]. These countries share similar fundamental characteristics in terms of economic structure, labour force, transportation costs, and legislation, yet they often differ in political or economic developments, which can be a source of uncertainty. This theoretical foundation justifies our empirical approach of examining both the broader region and a subgroup of countries experiencing heightened socio-political instability, allowing us to test how different types and intensities of uncertainty affect FDI flows.

The Concept and Empirical Measures of Uncertainty

The concept of uncertainty began to be intensively investigated at the beginning of the 20th century, and over time its interpretation has become inseparable from the study of market participants’ behaviour. With the development of the concepts of expected utility and profit maximization within the neoclassical economic paradigm, the question arose about the possibility of estimating the probability and outcomes of different events. This is not possible in the case of uncertain events, which is the key distinction from risky events. In a risky environment, there are multiple possible outcomes whose realization cannot be predicted with certainty, but based on historical data and specific models, appropriate probabilities of occurrence can be assigned to them. In contrast, in an uncertain environment, it is impossible to assign probabilities to potential outcomes [29]. Uncertainty in economic

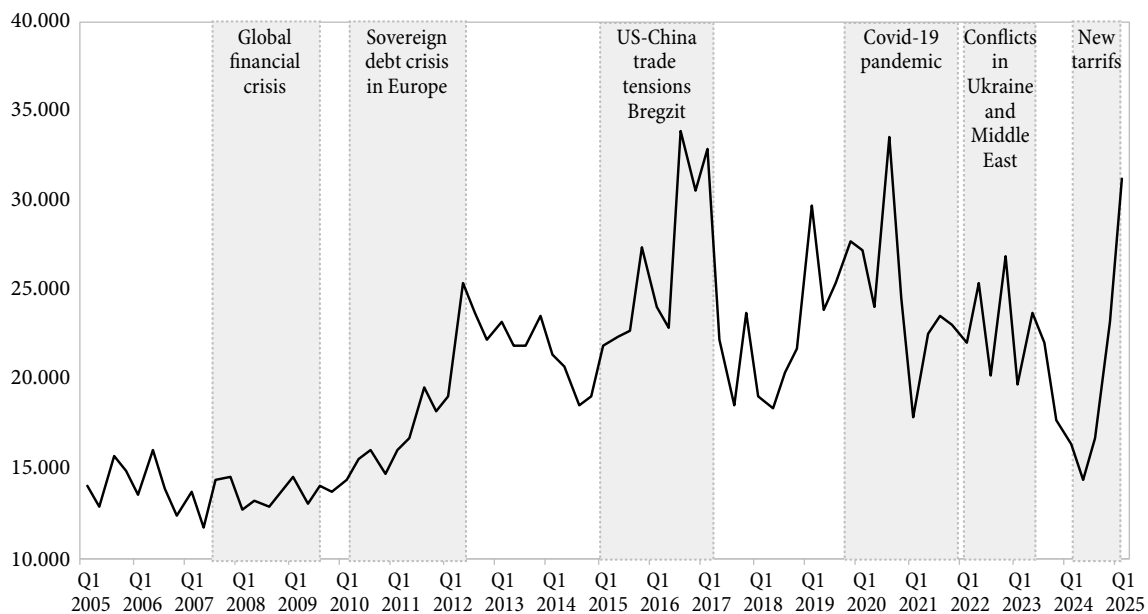
theory and practice gains particular significance in the context of investment decisions, which by their nature and effects are oriented toward the future. In *The General Theory of Employment, Interest and Money*, J. M. Keynes [28] emphasizes that it is difficult for entrepreneurs to estimate the return on investment several years ahead, noting that one of the key drivers of investment, besides self-confidence, is the so-called “animal spirit,” which reflects an entrepreneur’s intuitive belief in the success of a business venture despite uncertain outcomes. In this understanding of uncertainty, one can also recognize the postulates of behavioural economics as a complement to the prevailing findings of neoclassical economics.

Thus, the fundamental determinant of the concept of uncertainty lies in the difficulty of predicting and quantifying its consequences. Precisely for this reason, *empirical studies have developed a range of methods for measuring the level of uncertainty*. The literature typically distinguishes three groups of measures: the first group uses indicators from financial markets, primarily the volatility of asset prices and financial derivatives, which reflect the risk perception of financial market participants; the second group relies on the results of survey research, used to quantify business leaders’ expectations about future movements of economic and financial variables; the third group of measures reflects the frequency of the term “uncertainty” appearing in economic news texts and professional journals, serving as an indicator of the perception of uncertain events in public discourse [11]. Given their increasing application in professional and scientific research, the third group of measures, which is oriented towards the present and near future as they measure uncertainty in real time, attracts particular attention. Several popular measures currently stand out in this group, such as the Economic Policy Uncertainty Index, created by Baker et al. [6] based on textual analysis of news articles published in the US that contain terms related to uncertainty in the realm of policy and economics. Also of interest is the analysis of the index measuring economic uncertainty based on the content of posts on the social network X (formerly Twitter) [7], where the authors use a large database of posts in the form of tweets, identifying those that contain keywords associated with uncertainty.

Another example is the Geopolitical Risk Index, created by Caldara & Iacoviello [16], which measures the frequency and intensity of events that increase uncertainty related to geopolitics, such as terrorist attacks, international tensions, and wars.

In this research, we have chosen the abovementioned WUI indicator as an empirical measure of uncertainty. It measures the frequency of the word “uncertainty” per total number of words and is published by the research unit of the renowned British magazine *The Economist* [1] for a total of 143 countries worldwide. *A higher WUI level for a country indicates a higher degree of total uncertainty in that country, and vice versa*. As expected, the WUI achieves lower values in developed countries than in emerging and developing countries. Furthermore, in countries more exposed to political and economic instability, the WUI records both higher values and oscillations as well. Unlike other uncertainty indicators, the WUI enables consistent comparability between countries and across different time periods because it is based exclusively on economic and political events, thereby largely eliminating “noise” from areas not directly related to this topic. An additional advantage of the WUI is its ability to capture different time horizons of uncertainty, from long-term periods of uncertainty, such as geopolitical tensions, to short-term periods, such as electoral processes. The aggregate WUI is obtained as a weighted average of the individual WUIs for each country. The weighting is based on a five-year symmetric moving average of each country’s GDP expressed in US dollars. Based on the movement of the WUI indicator, presented in Graph 1, it can be observed that global uncertainty from the outbreak of the global financial crisis until the present day has recorded much higher values than in the period before 2008. Increases in the WUI correspond with crisis episodes, such as the European sovereign debt crisis of 2010-2012, the United Kingdom’s exit from the European Union and China-US custom barriers in 2016, the declaration of the global coronavirus pandemic in early 2020, as well as the escalation of the Ukrainian crisis in early 2022 and Middle East crises in late 2023. In late 2024 and early 2025, the WUI again increased sharply due to escalating trade tensions among major economies, primarily new tariffs introduced

Figure 1: Dynamics of the Global Uncertainty Indicator WUI
(number of mentions of the word “uncertainty” and its variants per total word count, quarterly)*



*The WUI has been rescaled by multiplying by 1,000,000 due to cross-country aggregation and comparability over time.
Source: Authors' graph, adopted from Ahir et al. [1].

by the US on imports of goods from China, the EU, and much of the world.

Considering previous insights, *the aim of this research is to quantify the impact of uncertainty on capital flows by examining the relationship between FDI inflows in the form of equity capital and reinvested earnings and the chosen global uncertainty indicator, the WUI.* The analysis was first conducted for a total of 11 countries in the CEE region – Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, North Macedonia, Poland, Romania, Slovakia, Slovenia, and then at the level of a group of four countries – Bulgaria, Georgia, Romania, and Slovakia, which faced specific internal shocks. These four have been characterized by a higher degree of uncertainty in recent years, as measured by their country-specific WUI. This is partly a consequence of global factors and partly due to specific local factors, namely various forms of socio-political crises that these countries have been facing over the past one to two years. Although Serbia is not part of this study, due to the unavailability of WUI data series, the similarities with the countries in the region can contribute to a better understanding of the current situation and the reasons for the sharp decrease in FDI inflows in the first half of 2025 (approximate 40% year-on-year). This can be

linked both to globally elevated uncertainty due to enacted tariff measures and to the current socio-political crisis.

Empirical Literature Review

Table 1 provides a brief overview of studies that have empirically investigated the effects of different forms of uncertainty – considering its source (global, regional, local) and its form (economic, political, health, security, etc.) – on FDI inflows across countries and geographical regions. Following the approach used in most of these studies and the methodology developed by Baltagi [8], our empirical analysis employs dynamic panel models with fixed effects to assess the impact of the chosen empirical measure of uncertainty, the WUI, on FDI inflows. These models account for both the time dynamics of FDI inflows and the specificities of individual countries in the CEE region.

Empirical Analysis of the Impact of Uncertainty on Foreign Direct Investment Inflows in the CEE Region

With the aim of empirically verifying the theoretical framework, statistical and econometric analysis of the

Table 1: Overview of the empirical studies on the impact of uncertainty on foreign direct investment inflows

Author(s)	Sample	Analysis method	Main Research Findings
Jardet et al. [26]	Total of 129 countries: developed (22), emerging (57) and developing (50). Time period: 1995–2019.	Dynamic panel models	Political uncertainty significantly affects FDI inflows, but the effects vary in strength and direction between different country groups. Global uncertainty has a greater impact on FDI than country-specific uncertainty. When global uncertainty is high or prolonged, investors transfer capital to developed economies perceived as safe.
Borozan et al. [14]	G7 and BRICS countries. Time period: 1995–2019.	ARDL and dynamic panel models	Economic policy uncertainty shows a statistically significant negative effect on FDI in G7 and BRICS countries, with effects being more pronounced in developing economies. The importance of a predictable and stable regulatory and political system for attracting foreign capital is emphasized.
Zhang et al. [37]	Total of 48 Asian countries. Time period: 2000–2020.	Dynamic panel models	Global Economic Policy Uncertainty (GEPU) has a significant negative impact on FDI inflows. Domestic economic and political uncertainty also negatively affects FDI, but the effect is smaller than that of global uncertainty. A more developed financial sector mitigates the impact of domestic but not global uncertainty factors.
Jahn & Stricker [25]	Three country groups by income level: high (37), upper-middle (26) and lower-middle (13). Time period: 1996–2017.	Descriptive statistics, correlation analysis and dynamic panel models	FDI components (equity, reinvested earnings, intra-company loans) show different sensitivities to political uncertainty (WUI). This is important for foreign investment flows, especially in low and middle-income countries.
Choi et al. [19]	Total of 16 countries. Time period: 1985–2013.	Dynamic panel models	An increase in domestic economic policy uncertainty significantly reduces FDI inflows, with the effect being more pronounced in countries with less developed financial sectors.
Ho & Gan [23]	Total of 142 countries, classified by income level and geographic region. Time period: 1996–2019.	Dynamic panel models	A negative impact of health uncertainty (pandemics) on FDI inflows is confirmed, particularly pronounced in Asia-Pacific region and developing countries. This reduces investment, GDP, and increases unemployment.
Suleyman [35]	Total of 10 Central and Eastern European countries. Time period: 1990–2018.	Descriptive statistics, correlation analysis, and dynamic panel models	Local uncertainty (WUI) does not show a statistically significant impact on FDI inflows. However, regional and global uncertainty negatively affect FDI inflows in the region's countries.
Brada et al. [15]	Central European, Baltic, and Western Balkan countries. Time period: 1993–2001.	Dynamic panel models	Economic transition and political instability (domestic/international) significantly reduce FDI inflows in transition economies. Good reforms enable higher FDI inflows, while political instability in the Balkans explains deficit flows.
Carstensen & Toubal [18]	Countries of Central and Southeastern Europe and EU countries. Time period: 1993–1999.	Dynamic panel models	Traditional FDI determinants (market potential, labour costs, skills, resources) and transition factors (privatization, systemic risk) have a significant impact. Uncertainty (legal, political, economic) deters FDI inflow.

impact of uncertainty measured via the WUI on FDI inflows in the observed CEE region was conducted below.

Testing the Stationarity of the Analysed Time Series in the Panel Data

To ensure comparability across the countries in the sample, the analysis draws on one of the IMF's core databases, which contains time series of international finance indicators for 194 countries worldwide. Specifically, the following quarterly time series were used in the analysis: FDI, implying investment in equity capital and reinvested earnings (denoted as FDI); the year-on-year growth rate

of nominal GDP (denoted as NGDPG) as a measure of the speed of economic development and the size of the economy; the year-on-year growth rate of real GDP (denoted as RGDPG) as a measure of overall economic activity; the year-on-year inflation rate measured by the change in the CPI (denoted as CPI); and the volatility of the exchange rate (denoted as EXRV), measured as the standard deviation of the exchange rates of the observed national currencies against the US dollar. The analysed series form a balanced data panel for a total of 11 countries in the CEE region from Q1 2015 to Q1 2025.

Prior to selecting the appropriate econometric model and its optimal specification, an analysis of the stationarity

Table 2: Unit Root Tests on the Time Series of the Observed Variables

Variables	Unit Root Testing	IPS (p-value)	Presence of Unit Root	Pesaran (p-value)	Presence of Unit Root	Deterministic Components
FDI	in level	-8.95 (0.00)	NO	-3.94 (< 0.01)	NO	constant
	in 1st difference	-	-	-	-	
WUI	in level	-5.42 (0.00)	NO	-3.18 (< 0.01)	NO	constant
	in 1st difference	-	-	-	-	
NGDPG	in level	-3.52 (0.00)	NO	-2.36 (< 0.05)	NO	constant
	in 1st difference	-	-	-	-	
RGDPG	in level	-5.88 (0.00)	NO	-2.87 (< 0.01)	NO	constant
	in 1st difference	-	-	-	-	
CPI	in level	-3.35 (0.00)	NO	-2.91 (< 0.01)	NO	constant
	in 1st difference	-	-	-	-	
EXRV	in level	-9.52 (0.00)	NO	-5.08 (< 0.01)	NO	constant
	in 1st difference	-	-	-	-	

Source: Authors' calculation and presentation using the EViews13 statistical package.

Note: A constant was selected within the deterministic components based on the graphical display of the selected variables and the application of the Stock-Watson procedure. EViews does not calculate specific p-values for the Pesaran test but only displays whether they are greater than or less than 0.01, 0.05, or 0.10. The critical values for this test are -2.54, -2.31, and -2.20 for significance levels of 1%, 5%, and 10%, respectively.

of the time series within the panel was conducted using unit root tests for panel data, presented in Table 2. The Im, Pesaran and Shin (IPS) test and the Pesaran test were used, which differ in their assumptions regarding cross-sectional dependence between the series. The IPS test starts from the null hypothesis that all series in the panel have a unit root, while the alternative hypothesis requires that at least one series is stationary. In contrast, the Pesaran test tests the hypothesis that all series are non-stationary, with the alternative that some series may be stationary. *The results of the IPS test and the Pesaran test indicate the stationarity of all observed series.*

Since the tested time series are stationary, that is, integrated of order $I(0)$, *it is concluded that it is possible to apply the Generalized Method of Moments (GMM) as an appropriate method for estimating the impact of the selected variables on FDI inflows.* It is a method developed by Arellano and Bond [4] and later extended by Arellano and Bover [5] and Blundell and Bond [12], which allows a lagged dependent variable to be an explanatory variable without causing problems of endogeneity and potential correlation with the error term [13]. This method incorporates dynamically lagged effects. An additional advantage is that GMM has proven to be an efficient method in the case of balanced panels with a relatively short time dimension (T) and a larger number of countries (N), which also corresponds to the characteristics of the data in our research. The results of the estimated econometric

specification for the CEE region from Q1 2015 to Q1 2025 are presented below.

Analysis of the Impact of Uncertainty on Foreign Direct Investment Inflows in the CEE Region

Using a dynamic panel model with fixed effects, the current values of FDI were estimated based on the lagged values of FDI, the uncertainty indicator WUI, and the control variables – CPI, NGDPG, RGDPG, and EXRV. It should be noted that the comprehensive analysis includes two variants of the dynamic panel models for all 11 countries in the region, as well as for the four countries characterized by some form of recent internal socio-political crisis:

- Variant 1, which includes the control variables NGDPG and CPI, and
- Variant 2, which includes the control variables RGDPG and EXRV.

These control variables are common determinants in models examining FDI flows as they represent macroeconomic fundamentals. The literature on FDI flows in the CEE region emphasizes the importance of real and nominal GDP, inflation, and the exchange rate as key factors for attracting foreign capital [10], [24]. Splitting the analysis into a variant with NGDPG and a variant with RGDPG allows for testing the hypothesis of whether investors react more strongly to the size of the economy or the dynamics of its real growth, which is particularly

important in countries facing socio-political crises. As internal instruments in both variants, lagged values of the explanatory variables and two exogenous variables – CPI and EXRV – were used, considering that capital mobility is partly conditioned by the dynamics of prices [30] and the exchange rate [17].

In Variant 1, the following specification was estimated:

$$FDI_{it} = \alpha + \beta_1 FDI_{i,t-1} + \beta_2 WUI_{i,t} + \beta_3 NGDPG_{i,t} + \beta_4 CPI_{i,t-1} + u_{it} \quad (1)$$

where the subscript i denotes the country ($i = 1, \dots, 11$), t denotes the period ($t = 1, \dots, 41$), and the error term can be decomposed as:

$$u_{it} = \mu_i + \lambda_t + \nu_{it} \quad i = 1, \dots, 11 ; t = 1, \dots, 41$$

where μ_i represents country-specific characteristics, and λ_t represents period-specific characteristics of the observed quarters. The λ_t are assumed to be fixed parameters estimated as coefficients of time dummy variables. The specification was estimated using the Stata13 software, and the results of the dynamic panel estimation, based on the system GMM estimator, for the 11 countries in the CEE region are presented in Table 3. The estimated dynamic panel model is statistically significant overall (Wald test) and correctly specified, as it satisfies the standard diagnostic tests for the absence of second-order autocorrelation (Arellano-Bond) and the validity of the instruments (Hansen test), which confirm the consistency of the obtained GMM estimates.

Given that the value of the WUI indicator ranges between 0 and 1, the results of the analysis for the sample of 11 CEE countries show that an increase in the WUI by

0.1 units in the current quarter reduces FDI inflows in the same quarter by an average of 17.7%. This finding implies that current changes in the level of uncertainty affect FDI inflows very rapidly, within the same quarter, which can be linked to the fact that investors first analyse new information about political and/or economic uncertainty and react in the very short term. Furthermore, the growth rate of nominal GDP has a positive impact on FDI inflows, suggesting that an expanding economy signals stability and an attractive business environment to investors. Simultaneously, FDI inflows further accelerate economic development through the financing of new projects, knowledge and technology transfer, and job creation, thereby establishing a feedback loop that reinforces the link between economic growth and capital flows. The year-on-year inflation rate, lagged by one quarter, leads to a decrease in current FDI inflows, which is consistent with economic theory. The one-quarter lagged effect indicates that investors react after inflationary pressures begin to undermine macroeconomic stability, consequently affecting the inflow of new foreign capital. In addition to the results for all 11 CEE countries, we specifically examined the effects of uncertainty and the mentioned macroeconomic fundamentals on FDI inflows using a sample of four countries – Bulgaria, Georgia, Romania, and Slovakia – where factors of internal instability have been recorded in the recent period. For this group of countries, the following specification was estimated in Variant 1:

$$FDI_{it} = \alpha + \beta_1 FDI_{i,t-1} + \beta_2 WUI_{i,t-1} + \beta_3 NGDPG_{i,t} + \beta_4 CPI_{i,t-1} + u_{it} \quad (2)$$

Table 3: Results of the Estimated Dynamic Panel for 11 CEE Region Countries – Variant 1

Dependent Variable: FDI	Estimated Coef.	Std. Error	z-stat.	p-value	[95% Conf. Interval]	
FDI (-1)	0.28**	0.12	2.39	0.02	0.05	0.51
WUI	-1.77***	0.59	-2.98	0.00	-2.93	-0.60
NGDPG	0.21***	0.06	3.39	0.00	0.09	0.34
CPI (-1)	-0.09**	0.04	-2.29	0.02	-0.17	-0.01
S1	0.23	0.22	1.08	0.28	-0.19	0.66
S2	-0.83*	0.51	-1.63	0.10	-1.84	0.17
S3	0.73***	0.17	4.39	0.00	0.40	1.06
C	3.26***	0.58	5.65	0.00	2.13	4.39

Source: Authors' calculation using Stata13 software.

Number of observations = 411, Number of instruments = 28; Wald test statistic (probability) = 2616.62 (0.00); Arellano-Bond test statistic = 1.37 (0.17); Hansen test statistic = 5.57 (0.99). The designations ***, ** and * indicate statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Note: The balanced panel includes a total of 11 countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, North Macedonia, Poland, Romania, Slovakia, Slovenia. Changes in FDI inflows due to unit changes in the explanatory variables are represented by the estimated coefficients. The time dummy variables are denoted as S1, S2, and S3, taking the value of 1 in the respective quarter and 0 in the remaining quarters. S4 was omitted to avoid multicollinearity.

The key difference in the results for the group of four countries compared to the group of all 11 CEE countries is that the WUI exerts a statistically significant influence on FDI inflows with a lag of one quarter (Table 4). Although investors do not react immediately to an increase in uncertainty, they can perceive the negative effects of higher uncertainty within a relatively short time. The results from this model estimation prove that the negative effects of rising uncertainty on FDI inflows are even more pronounced compared to the larger group of 11 countries in the region, illustrating a hysteresis effect. Specifically, an increase in the WUI by 0.1 units in the current quarter reduces FDI inflows in the subsequent quarter by approximately 41.7% on average. The nominal GDP growth rate and the year-on-year inflation rate in this model were not statistically significant, but they were not omitted due to their expected sign, i.e., the direction of influence on FDI inflows, which is consistent with the findings for the group of all 11 CEE countries.

Therefore, countries in the CEE region that, in addition to global factors, also face domestic factors of socio-political uncertainty are more affected by the contraction of FDI. The results also confirm the expected positive inertia in FDI flows, which can be attributed to effects of *persistence* and *self-reinforcement*. This is consistent with the findings of those authors who highlight the positive effects of a country's reputation among existing foreign investors. Their investments reduce the perceived risk of the country and the entry costs for new investors, a phenomenon often referred to as the psychological *herding effect*. Overall, we

have established a clear negative impact of uncertainty, measured via the WUI, on FDI inflows across all 11 countries, particularly in the subgroup of four countries in the region that are currently facing some form of socio-political crisis. To examine the influence of real economic activity (RGDPG) on FDI inflows alongside the measure of economic size, dynamic panel models were specified in Variant 2. Nearly identical equations were estimated for the two groups of countries – all 11 and the subgroup of four – with the addition of the control variable EXRV.

$$FDI_{it} = \alpha + \beta_1 FDI_{i,t-1} + \beta_2 WUI_{it} + \beta_3 RGDPG_{i,t} + \beta_4 EXRV_{it} + u_{it} \quad (3)$$

$$FDI_{it} = \alpha + \beta_1 FDI_{i,t-1} + \beta_2 WUI_{i,t-1} + \beta_3 RGDPG_{i,t} + \beta_4 EXRV_{i,t-1} + u_{it} \quad (4)$$

According to the results presented in Tables 4 and 5, respectively, the statistical significance and correct sign of the coefficients for the variables FDI(-1) and WUI are observed. This indicates that, regardless of whether the size of the economy or real economic activity is considered, there is a pronounced negative impact of uncertainty on FDI inflows. Nevertheless, this impact is of lower intensity in the Variant 2 models. Specifically, the model for all 11 CEE countries shows that a 0.1 unit increase in the WUI leads to a 13.9% decrease in FDI inflows (Table 5), while in the model for the subgroup of four countries, the negative impact is, as expected, stronger and amounts to 23.7% (Table 6) during the observed period Q1 2015 – Q1 2025. It can be noted that the influence of the RGDPG variable on FDI inflows is slightly more intense compared to the NGDPG variable in the observed set of CEE countries.

Table 4: Results of the Estimated Dynamic Panel for Four CEE Region Countries – Variant 1

Dependent Variable: FDI	Estimated Coef.	Std. Error	z-stat.	p-value	[95% Conf. Interval]	
FDI (-1)	0.09***	0.03	2.77	0.01	0.03	0.16
WUI (-1)	-4.17*	2.24	-1.86	0.06	-8.57	0.22
NGDPG	0.19	0.15	1.31	0.19	-0.10	0.49
CPI (-1)	-0.09	0.09	-0.96	0.34	-0.28	0.09
S1	0.39***	0.09	4.44	0.00	0.22	0.56
S2	-2.00**	0.96	-2.07	0.04	-3.89	-0.11
S3	0.63***	0.24	2.62	0.01	0.16	1.10
C	5.00***	0.45	11.04	0.00	4.12	5.89

Source: Authors' calculation using Stata13 software.

Number of observations = 152, Number of instruments = 26; Wald test statistic (probability) = 606.85 (0.00); Arellano-Bond test statistic = 0.65 (0.51); Hansen test statistic = 0.00 (0.99). The designations ***, ** and * indicate statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Note: The balanced panel includes a total of four countries: Bulgaria, Georgia, Romania, and Slovakia. Changes in FDI inflows due to unit changes in the explanatory variables are represented by the estimated coefficients. The time dummy variables are denoted as S1, S2, and S3, taking the value of 1 in the respective quarter and 0 in the remaining quarters. S4 was omitted to avoid multicollinearity.

Table 5: Results of the Estimated Dynamic Panel for 11 CEE Region Countries – Variant 2

Dependent Variable: FDI	Estimated Coef.	Std. Error	z-stat.	p-value	[95% Conf. Interval]	
FDI (-1)	0.30***	0.12	2.57	0.01	0.07	0.53
WUI	-1.39***	0.51	-2.71	0.01	-2.39	-0.39
RGDPG	0.24***	0.08	3.05	0.00	0.09	0.39
EXRV	-0.03	0.14	-0.21	0.83	-0.30	0.24
S1	0.29	0.22	1.32	0.19	-0.14	0.72
S2	-0.74	0.49	-1.49	0.14	-1.70	0.23
S3	0.81***	0.16	5.09	0.00	0.50	1.13
C	3.56***	0.46	7.80	0.00	2.66	4.45

Source: Authors' calculation using Stata13 software.

Number of observations = 411, Number of instruments = 28; Wald test statistic (probability) = 2971.29 (0.00); Arellano-Bond test statistic = 1.24 (0.22); Hansen test statistic = 7.04 (0.99). The designations ***, ** and * indicate statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively.

Note: The balanced panel includes a total of 11 countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, North Macedonia, Poland, Romania, Slovakia, Slovenia. Changes in FDI inflows due to unit changes in the explanatory variables are represented by the estimated coefficients. The time dummy variables are denoted as S1, S2, and S3, taking the value of 1 in the respective quarter and 0 in the remaining quarters. S4 was omitted to avoid multicollinearity.

This suggests the conclusion that both the dynamics of economic activity and the size of the economy are equally important for attracting foreign capital.

In both variants, it is observed that for the four CEE countries which, alongside the global crisis, are also undergoing some form of socio-political crisis, the impact of uncertainty on FDI inflows is even stronger. This supports the thesis that capital is particularly sensitive to various internal factors of uncertainty and instability (e.g., electoral processes, protests, and civil unrest).

Conclusion

Based on the complete analysis, several key observations can be highlighted. Increased uncertainty stemming from global geopolitical and trade tensions significantly negatively affects the decisions of foreign investors, who reduce existing investments and postpone new projects in all CEE countries. The results from the dynamic

panel models show that this effect is more pronounced in countries that, in addition to global shocks, also face internal socio-political crises. It is confirmed that the effect of uncertainty on FDI is both statistically significant and economically relevant, as a 0.1 unit increase in the WUI leads to a 17.7% (Variant 1) and 13.9% (Variant 2) decrease in capital inflows across the entire region, and up to 23.7% (Variant 1) and 41.7% (Variant 2) in countries with more pronounced internal crises. This asymmetry in impact emphasizes that economic policies aimed at reducing local sources of uncertainty can effectively mitigate the negative effects of global shocks. Simultaneously, it was shown that both the growth of real GDP (economic activity) and the growth of nominal GDP (economic size) contribute to capital attraction to a similar extent. The effects of heightened uncertainty manifest in the very short term, indicating high sensitivity among investors and a rapid transmission of expectations into investment behaviour. This phenomenon is particularly accentuated in countries

Table 6: Results of the Estimated Dynamic Panel for Four CEE Region Countries – Variant 2

Dependent Variable: FDI	Estimated Coef.	Std. Error	z-stat.	p-value	[95% Conf. Interval]	
FDI (-1)	0.09***	0.04	2.52	0.01	0.02	0.16
WUI (-1)	-2.37**	1.23	-1.93	0.05	-4.77	0.03
RGDPG	0.12***	0.04	3.10	0.00	0.05	0.20
EXRV (-1)	13.74	8.91	1.54	0.12	-3.73	31.21
S1	0.19	0.19	1.00	0.32	-0.18	0.55
S2	-2.02**	0.91	-2.23	0.03	-3.80	-0.25
S3	0.57***	0.16	3.47	0.00	0.25	0.89
C	5.07***	0.39	12.89	0.00	4.30	5.84

Source: Authors' calculation using Stata13 software.

Number of observations = 152, Number of instruments = 38; Wald test statistic (probability) = 38.29 (0.00); Arellano-Bond test statistic = 0.59 (0.56); Hansen test statistic = 0.00 (0.99). The designations ***, ** and * indicate statistical significance of the coefficients at the 1%, 5%, and 10% levels, respectively. Note: The balanced panel includes a total of four countries: Bulgaria, Georgia, Romania, and Slovakia. Changes in FDI inflows due to unit changes in the explanatory variables are represented by the estimated coefficients. The time dummy variables are denoted as S1, S2, and S3, taking the value of 1 in the respective quarter and 0 in the remaining quarters. S4 was omitted to avoid multicollinearity.

that, alongside global uncertainty, face internal political and economic challenges, which can lead to a sharp withdrawal or postponement of investments. The research also demonstrated that the methodological choice of the uncertainty measure (WUI) enables reliable tracking of its influence across different time horizons, confirming its advantage as a tool for analysing and forecasting in the context of a changing global economy. Positive inertia in FDI flows shows that existing, particularly reputable foreign investors, play a stabilizing role under conditions of heightened uncertainty, as their presence can reduce risk perception among new investors, which is confirmed by reputation and imitation effects.

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Stojan Janković

has been working as Analyst at the National bank of Serbia, Economic Research and Statistics Department (since 2017) and has been promoted to Senior Analyst (since August 2023). His main areas of research are inflation and economic activity, real sector performances and labour market conditions in Serbia, central bank monetary policy decisions and economic movements in the international environment. He is currently PhD student at the University of Belgrade – Faculty of Business and Economics, where he completed undergraduate studies (2015) and master studies (2017). He worked at the Centre for Corporate Relations as assistant for establishing relationships with companies and institutions and student internships, assistant at the Alumni club and assistant on Trade Management Course at the Faculty of Business and Economics, University of Belgrade. He gained some experience in consulting on the projects for the clients and investors, dealing with business strategy and corporate financial analysis.



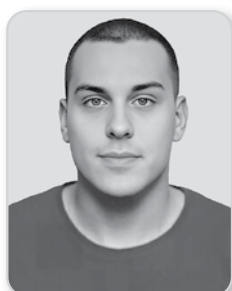
Emilija Janković

has been working as Junior Economist at the National bank of Serbia, Economic Research and Statistics Department (since September 2018) and has been promoted to Economist (since October 2021). Her main tasks and responsibilities include organizing, compiling, and disseminating data in the areas of balance sheet and interest rate statistics; implementing procedures, methodologies, and international standards in the field of monetary statistics; cooperating with the ECB and the IMF; organizing the publication of the Statistical Bulletin and editing the statistical section of the NBS website; calculating Net Domestic Assets; and organizing the structure and use of databases related to monetary statistics. Emilija is currently PhD student at the University of Belgrade – Faculty of Business and Economics, where she completed undergraduate studies (2018) and master studies (2021). Main fields of research are economics, statistics and econometrics.



Dragan Dživdžanović

has been working as Junior analyst at the National bank of Serbia, Economic Research and Statistics Department (since 2022). His main areas of research are inflation, real sector and external sector performances, central bank monetary policy decisions. He is currently master student at the University of Belgrade – Faculty of Business and Economics, where he completed undergraduate studies (2022). He published a working paper for National Bank of Serbia (2025) in which he examined *Cheapflation* phenomenon in Serbia during inflation pressures from 2022 to 2024.



Jovan Purčić

has been working as Junior Researcher at the National bank of Serbia, Economic Research and Statistics Department (since 2024). His main areas of research are inflation nowcasting, as well as other types of forecasting using BigData, assessment of news sentiment, and participation in the development of macroeconomic indicators using BigData. He is currently working on his master's thesis at the Faculty of Economics and Business, University of Belgrade, where he completed his undergraduate studies (2024) in the module of Business Informatics.