“The relationship between foreign capital inflows and entrepreneurial stability in the context of bankruptcy prevention”

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THE RELATIONSHIP BETWEEN FOREIGN CAPITAL INFLOWS AND ENTREPRENEURIAL STABILITY IN THE CONTEXT OF BANKRUPTCY PREVENTION

Abstract

Ensuring entrepreneurial stability of the business environment constitutes an important objective of public administration, particularly relevant amid global political and economic instability and exposure to external shocks, especially for minimizing the risks of financial distress and preventing corporate bankruptcy. The study aims to assess the relationship between foreign direct investment (FDI) as a percentage of GDP and the level of entrepreneurial stability as a prerequisite for reducing bankruptcy intensity and ensuring the sustainable functioning of enterprises. Correlation and regression analyses are applied for the 2016–2023 data across 15 EU countries selected according to the criterion of data availability. The results reveal the association between FDI (% of GDP) and a composite indicator of entrepreneurial stability, which indirectly reflects the resilience of enterprises to bankruptcy and crisis phenomena. A cross-country differentiation allows for the classification of four groups: countries with a strong negative association (Germany, France, Latvia, Lithuania), a strong positive association (the Netherlands, Romania), a medium level of association (Estonia, Spain, Croatia, Italy, Cyprus), and a weak relationship (Luxembourg, Poland, Portugal, Norway). Using the ARDL model, both short-term and lagged effects between FDI and entrepreneurial stability have been identified, as well as their impact on financial resilience and the reduction of bankruptcy probability over time. The regression models enable the assessment of the impact of FDI on business stability, forecasting bankruptcy risks, and supporting managerial decision-making to stimulate entrepreneurial activity and enhance economic security.

Keywords model, investment, bankruptcy, innovation, international economics, foreign capital, management, entrepreneurship

JEL Classification F21, G33, L26

INTRODUCTION

Foreign direct investment (FDI) constitutes a significant factor in shaping the economic development of countries. In particular, it enhances labor productivity, contributes to enterprise development, and serves as a foundation for the formation of modern open economies, while simultaneously acting as an important instrument for strengthening business financial resilience and preventing corporate bankruptcy.

Research on FDI is based on the analysis of market size, economic conditions, institutional environment, agglomeration effects, policy decisions, corruption, wage levels, labor productivity, the use of advanced technologies, political preferences, geographical location, the presence of free economic zones, protection of property rights, and the optimal level of transaction costs (Zhang & Kim,

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2022), among others. These factors are also examined in terms of their impact on reducing the risks of financial instability, insolvency, and bankruptcy of economic entities in a dynamic economic environment.

The use of a composite indicator of entrepreneurial stability is justified given the complexity and multidimensional nature of business environment stability. Entrepreneurial stability cannot be adequately captured by a single indicator, as it is shaped by multiple processes, including the dynamics of firm entry, survival, and exit. Therefore, an integrated (composite) indicator can aggregate these multidirectional processes into a single measurable construct, thereby enhancing analytical accuracy and enabling cross-country comparisons.

A key role in such an indicator is played by business demography metrics, particularly firm birth and firm death rates. The firm birth rate reflects entrepreneurial activity, the attractiveness of business environment, and the availability of opportunities for initiating new ventures. At the same time, the firm death rate characterizes the level of risk in the environment, the degree of economic instability, and the ability of businesses to adapt to changing conditions. A joint analysis of these two indicators allows for the assessment of the balance between firm entry and exit. If the firm birth rate consistently exceeds the firm death rate, this indicates a relatively high level of entrepreneurial stability. Conversely, the dominance of firm closures signals a destabilization of the business environment. Thus, a composite indicator integrating these components provides a more comprehensive and objective representation of entrepreneurial stability.

Under conditions of global political and economic instability, intensified external shocks, and the transformation of international economic relations, ensuring entrepreneurial stability in the business environment becomes particularly important. Foreign direct investment represents one of the key factors influencing the development of national economies; however, its impact on entrepreneurial stability is ambiguous and varies across countries, which necessitates in-depth empirical analysis. The scientific problem addressed in this study lies in the uncertainty regarding the nature and strength of the relationship between foreign direct investment (as a percentage of GDP) and the level of entrepreneurial stability, as well as in the absence of a universal approach to assessing this impact across countries, taking into account their economic specificities and dynamic effects.

1. LITERATURE REVIEW AND HYPOTHESIS

The theoretical foundation of this study, in line with its objectives, is based on several interrelated concepts, including the theory of international capital movement, economic growth theory, entrepreneurship theory, and institutional theory. Collectively, these frameworks provide a basis for examining mechanisms to ensure entrepreneurial stability and prevent business bankruptcy.

The theory of international capital movement explains that foreign direct investment (FDI) flows from more developed economies to those with fewer resources, contributing to the equalization of development levels and the reduction of financial imbalances that may lead to firm insolvency.

FDI plays a crucial role in ensuring economic development, particularly in developing countries. It is defined as cross-border investment aimed at obtaining a lasting interest and significant control over an enterprise in another economy (Ruchita Sharma & Ruchi Sharma, 2025).

FDI contributes to capital accumulation in businesses and facilitates profit generation, while simultaneously enhancing firms' financial resilience and reducing the likelihood of insolvency and bankruptcy. Moreover, FDI enables firms to benefit from technological, economic, and other spillover effects that increase productivity (Zhou et al., 2022), adopt advanced management practices, integrate more deeply into international trade, and establish forward and backward linkages between countries. These effects collectively contrib-

ute to the development of a competitive business environment and poverty reduction, thereby supporting long-term entrepreneurial stability.

In line with the research objective, the theoretical basis of this study combines the theories of international capital movement, entrepreneurship, economic stability, and institutional development to explain the relationship between foreign capital inflows and entrepreneurial stability in the context of bankruptcy prevention. The theory of international capital movement suggests that foreign direct investment (FDI) flows from developed economies to countries with limited financial resources, contributing to business sustainability, financial resilience, and lower bankruptcy risks. FDI is generally understood as a cross-border investment that provides a lasting interest and significant influence over enterprise management in another economy (Ruchita Sharma & Ruchi Sharma, 2025).

FDI enables the replenishment of business capital and the achievement of its primary objective – profit generation – while simultaneously enhancing the financial stability of enterprises and reducing the likelihood of insolvency and bankruptcy. In addition, FDI allows firms to obtain technological, economic, and other effects that increase productivity (Zhou et al., 2022); to apply advanced management methods; to achieve broader integration into international trade; to create forward and backward linkages between countries; and to ensure the development of a more competitive environment while reducing poverty. Collectively, these effects contribute to the formation of a stable business environment and the prevention of bankruptcies in the long term. According to Ruchita Sharma and Ruchi Sharma (2025), in 2022, FDI directed toward research and development accounted for approximately 32% of global expenditures on such activities. In particular, China allocates about 1% of its GDP to these purposes and obtains approximately 5% of economic growth, which further confirms the role of investment as a tool for enhancing economic resilience and reducing the risks of business bankruptcy.

Within institutional theory, the quality of institutions (including stability, legal framework, and corruption) determines both the mechanisms of attracting FDI and the mechanisms of business stability. Nguyen and Lee (2021) identify the main determinants influencing the decision-making process regarding FDI attraction, including trade openness, real labor costs, infrastructure, investment profitability, political risk, human capital, government incentives, and the financial system. An analysis of 116 countries regarding the impact of uncertainty and financial development on FDI inflows revealed that countries with higher levels of economic policy uncertainty are less likely to attract FDI. In addition, countries with more developed financial markets are better able to attract FDI. Thus, FDI is attracted to countries with higher levels of economic and political stability. Furthermore, FDI depends on such factors as political stability, low levels of corruption, and low default risk.

An important factor in attracting FDI into the economies of developing countries is development zones. In China (based on an analysis of 2,825 districts over the period 2006–2019), these zones contributed to economic development, industrial integration, technological innovation, and FDI inflows (Liu et al., 2025). In particular, the policy of modernizing economic development zones has a positive impact on entrepreneurial activity. The level of FDI is also influenced by antitrust policy, which may have both positive and negative effects. Clougherty and Zhang (2023) analyzed panel data for the period 2002–2018 based on the United States to identify the relationship between antitrust regulation and FDI. The empirical results showed that elements of political risk related to antitrust legislation contribute to FDI inflows. On the other hand, political uncertainty in antitrust regulation restrains the attraction of FDI into the country.

FDI should move from countries with abundant financial resources to countries that experience a shortage of such resources, and from more productive countries to less productive ones. FDI provides new technological and financial resources to recipient countries, which makes it possible to renew assets, replenish firms' financial capital, and develop organizational and managerial capabilities (Budiono & Purba, 2023; Kozlovskyi et al., 2019). Tax incentives, particularly corporate income tax, have a favorable effect on attracting

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FDI. This is evidenced by the experience of many countries, for example, Vietnam (Hoi et al., 2024). At the same time, companies that attract FDI often pursue policies of tax base minimization. In order to prevent such minimization, the G20 initiative on the "Global Minimum Tax" was introduced to create equal conditions for all countries. This minimum tax may lead to a reallocation of tax revenues to other countries (Nguyen & Lee, 2021) and complicate the process of attracting FDI.

In economic growth theory, FDI is assigned an extremely important role. Indeed, the accumulation of capital, particularly through the attraction of FDI into a country's economy, determines its ability to develop and implement innovative technologies, which leads to increased labor productivity and overall economic growth. Thus, Sugozu et al. (2023), examining the relationship between economic growth and portfolio investment in 18 developed and 27 developing countries, showed that long-term portfolio investments have a positive impact on economic growth in developing countries. At the same time, portfolio investments in securities (stocks and long-term bonds) are not associated with economic growth in developed countries. Capital accumulation has a positive effect on economic growth in both developing and developed countries.

Analyzing the World Bank statistical database across 189 countries worldwide, an important conclusion was drawn regarding the main determinants of FDI attraction (Fan et al., 2021). Thus, a correlation-regression analysis revealed that the largest volumes of FDI are attracted to countries that ensure stability in contract enforcement and efficiency in regulating international trade. FDI can stimulate business development by financing enterprises in the host country. This leads to an increase in economic and financial business activity, growth in tax revenues, higher labor productivity, and overall national competitiveness. The main advantages of FDI in business development include: access to new markets; diversification of products in new markets; acquisition of valuable experience that contributes to enhanced competitiveness and operational efficiency; economies of scale; reduction of transaction costs, which leads to increased profitability and improved market competitiveness. The main risks of attracting FDI are: political and regulatory risks; cultural and strategic risks. Analyzing a sample of 67 emerging markets over the period 2002–2018, Su et al. (2021) found that FDI has a positive impact on entrepreneurial productivity, which in turn contributes to the development of the financial market and labor market flexibility. At the same time, these effects are not observed in developed economies.

Based on entrepreneurship theory, business is a powerful driver of innovation, employment, and economic growth, which ultimately has a positive effect on business stability. The literature confirms the thesis that entrepreneurship influences economic development. To achieve this, entrepreneurs must effectively utilize available assets that create new jobs and innovative opportunities. The economic development of entrepreneurship depends on the transformation of production resources (land, people, and money), which generates national income (AL-Ajlouni, 2023; Kozlovskyi et al., 2020). Important prerequisites for entrepreneurial success are access to markets, financial capital, and social capital (El-Haddadeh et al., 2021). Entrepreneurship focuses on creating new products. In the system of economic development, entrepreneurship plays an important role, namely formation and distribution of capital, job creation (Khalil et al., 2022), investment attraction (Shamout et al., 2022), promotion of balanced national and regional development, formation of the institutional environment (Su et al., 2021), creation of gross domestic product and income per capita, promotion of fair distribution of national wealth and income; improvement of labor productivity (Fan et al., 2021), growth of self-employment, promotion of innovation (Koomson et al., 2022), and overall economic development.

Assessing manufacturing firms listed on the Indonesian Stock Exchange over the period 2014–2021, Handoyo et al. (2023) showed that firms' performance is influenced by operational efficiency, business strategy, and ownership structure. As competition increases, the operational efficiency of manufacturing enterprises improves. When active business strategies are applied, manufacturing firms perform more effectively than those relying solely on defensive strategies. The research on the impact of FDI on entrepreneurial activity is mixed. That is, there is no clear consensus that FDI plays a decisive role in the creation of new

firms. For example, Chen and Zhou (2022) paid attention to both the positive and negative effects of FDI on stimulating entrepreneurial activity. They analyzed the impact of FDI on the growth of innovative entrepreneurship based on statistical data from China's 31 provinces over the period 1998–2007. It was demonstrated that FDI has a favorable effect on the development of entrepreneurial activity. Ruchita Sharma and Ruchi Sharma (2025) examined the impact of FDI on firms' innovation activity using the example of Indian firms. The study was conducted based on statistical data from Indian businesses over the period 2010–2020. The hypothesis that FDI has a positive impact on Indian enterprises, particularly on their innovative activity through the application of advanced technological knowledge, was confirmed. Thus, firms attracting FDI for innovative purposes demonstrate higher performance, in particular through the acquisition of permits (patents), compared to firms that do not attract FDI.

The life cycle of an enterprise can be assessed through three phases: inception, growth, and liquidation. Farias et al. (2021) emphasize that bankruptcy, which precedes the liquidation phase of an enterprise, occurs due to the inability to settle obligations to creditors, suppliers, and shareholders, and due to the occurrence of external shocks. Such shocks may include political risks, GDP decline, high unemployment rates, investment shortages, including FDI. The greater the number of newly created enterprises and the smaller the number of liquidated ones, the faster humanity can achieve the Sustainable Development Goals for the period up to 2030, established by the United Nations. For example, the liquidation of enterprises leads to an increase in unemployment, which hinders the achievement of Goal 8 "Decent Work and Economic Growth," Goal 1 "No Poverty," Goal 2 "Zero Hunger," Goal 3 "Good Health and Well-being," and Goal 10 "Reduced Inequalities."

In a market economy, bankruptcy is considered an integral part of business functioning. On the one hand, bankruptcy negatively affects economic processes and agents, including creditors, shareholders, suppliers, employees, consumers, and the population as a whole. On the other hand, bankruptcy is a mechanism that eliminates unprofitable organizations that are unable to operate efficiently and utilize scarce resources. Financial risks arise due to the failure of businesses to achieve financial objectives and may take many forms, including inflation, decline in stock value, currency risks, liquidity risks, interest rate risks, cash flow risk, and bankruptcy risk (Poliakov & Zayukov, 2022).

Factors influencing the probability of bankruptcy include: the level of adult population coverage by credit bureaus; access of the banking system to information from credit bureaus; financial performance indicators of enterprises (liquidity, business activity, use of bankruptcy prediction models, etc.); the level of protection of business owners' rights; the level of corporate transparency; the level of responsibility of business directors; the level of tax burden; and the effectiveness of the judicial system in decision-making in the field of bankruptcy, among others.

A specific type of enterprise is the so-called zombie firm (zombie enterprises), whose activity is characterized by low profitability and whose existence is explained by the presence of government subsidies and low interest rates (Banerjee & Hofmann, 2020). These are financially non-viable companies (potential bankrupts). Such enterprises negatively affect the efficient allocation of scarce resources by "locking" them in, thereby harming the operations of other organizations that act as drivers of economic development (Ren et al., 2023). It is believed that such inefficient enterprises negatively affect the institutional and business environment of a country and, overall, the attraction of FDI.

The study by Chen et al. (2024), conducted on statistical data of Chinese industrial enterprises for the period 2003–2013 at the prefecture-city level, concluded that the larger the share of zombie firms, the lower the inflow of foreign investment. Their negative impact on normal market functioning and business activity hinders the attraction of FDI to the local market. Moreover, factors such as corruption and market segmentation significantly intensify this "crowding-out" effect. In contrast, improvements in trust, stronger protection of intellectual property rights, and the development of factor markets (raw materials, labor, finance, and technology) mitigate it. These enterprises owe their existence, in particular, to the intervention of local government authorities that support them (Qiao & Fei, 2022).

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The mechanism through which such enterprises negatively affect economic development is explained in the literature as follows. First, they crowd out FDI inflows, particularly by retaining scarce resources. As a result, the allocation of resources in normal firms is disrupted, which negatively affects their efficiency, including labor productivity, and leads to an increase in the cost of credit resources (Ren et al., 2023). In addition, they limit employment opportunities and the creation of new jobs, which negatively affects FDI attraction (Chen et al., 2024). Zombie firms crowd out FDI through access to preferential loans and government subsidies, which increases operational costs for normal firms and for firms seeking to enter local markets. Ren et al. (2023) note that zombie firms create barriers to entry for foreign firms and hinder the free flow of resources.

Chen et al. (2024) emphasize that zombie firms cause significant damage to entrepreneurial activity and overall economic development, particularly by hindering the attraction of FDI (using China as an example). The study recommends that the Chinese government take measures to rapidly eliminate zombie firms and prevent their formation. To this end, it is proposed to improve bankruptcy procedures for such firms to facilitate their exit from the market, as well as to introduce preventive mechanisms for managing financial stability in order to avoid the accumulation of insolvent enterprises. In addition, attention is drawn to the need to establish an effective early warning system for the emergence and operation of such firms as a tool for timely identification of bankruptcy risks and minimization of their negative impact on the economic environment. Therefore, the market should independently eliminate such firms and improve the efficiency of the institutional environment as a key factor in attracting FDI, which would simultaneously reduce systemic bankruptcy risks in the economy.

The review of the problem of assessing the association between FDI and market conditions, particularly the creation and bankruptcy of enterprises, allows us to conclude that FDI contributes to economic development, including business stability, and creates prerequisites for bankruptcy prevention through improved financial stability and operational efficiency of firms. At the same time, there is a limited number of scientific studies addressing the relationship between FDI and components of a synthetic indicator of entrepreneurial stability, particularly in the context of assessing bankruptcy risks and prevention mechanisms. Thus, insufficient attention has been paid to the association between FDI and the level of entrepreneurial stability as a tool for bankruptcy prevention.

The aim of the study is to assess the association between foreign direct investment (FDI) as a percentage of GDP and the level of entrepreneurial stability as a prerequisite for reducing the intensity of bankruptcies and ensuring sustainable business functioning. We attempt to fill the relevant research gap. The hypothesis is as follows:

H1: An increase in FDI inflows contributes to a higher level of entrepreneurial stability and a reduction in the risk of business bankruptcy.

2. METHODOLOGY

The study analyzes the dynamics of enterprise registration in EU countries and selected European countries (Germany, Estonia, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, Romania, and Norway) over the period 2016–2023 based on Eurostat statistical data. Second, is assesses analyze bankruptcy indicators in EU countries and selected European countries over the period 2016–2023 based on Eurostat statistical data. The analysis is based on statistical data available for selected countries, as complete and consistent datasets for the studied indicators were accessible in the Eurostat database only for these countries. Third, it analyzes the dynamics of foreign direct investment inflows as a percentage of GDP in EU countries over the period 2016–2023 based on Eurostat statistical data. Fourth, it calculates a synthetic indicator of entrepreneurial stability in selected countries over the period 2016–2023 based on Eurostat statistical data. Fifth, it examines the association between foreign direct investment (FDI) and the synthetic indicator of bankruptcy intensity relative to the dynamics of new enterprise creation in selected European countries over the period 2016–2023 based on Eurostat sta-

tistical data. Finally, it constructs correlation-regression models of the impact of FDI on the level of entrepreneurial stability in selected European countries over the period 2016–2023 based on Eurostat statistical data.

FDI (Eurostat, 2026a) is defined as a category of international investment made by a resident entity in order to acquire a lasting interest in an enterprise (provided that the investor obtains at least 10% of the enterprise's equity capital). This indicator is expressed as a percentage of GDP in order to eliminate the effect of differences in the size of economies reporting to Eurostat. FDI includes equity capital investments, reinvested earnings, and intra-company loans between parent companies and subsidiaries. The calculation of this indicator is as follows (equation 1):

$$FDI_{\%GDP} = \frac{FDI}{GDP} \cdot 100, \quad (1)$$

where $FDI_{\%GDP}$ is the annual volume of foreign direct investment as a percentage of GDP; *FDI* is the annual volume of foreign investment in monetary terms; *GDP* is the annual gross domestic product in monetary units.

The obtained value of $FDI_{\%GDP}$ can be interpreted as follows: if $FDI_{\%GDP} < 1\%$), the country has low investment attractiveness; if $FDI_{\%GDP}$ is within 1–3%, the country has moderate investment inflows; if $FDI_{\%GDP}$ is within 3-5%, the country has high investment inflows; if $FDI_{\%GDP} > 5\%$, the country has very high investment inflows. The advantages of the $FDI_{\%GDP}$ indicator are that it allows comparison of countries with different economic sizes, particularly EU member states, as well as assessment of countries' investment attractiveness and analysis of the role of FDI in ensuring economic development.

The index of enterprise registration (creation) and bankruptcy is a statistical indicator that characterizes the dynamics of business creation and bankruptcies across different types of economic activity during a year. This indicator is used to assess entrepreneurial activity and financial stability in the economy (Eurostat, 2026b). The equation for calculating the index ($I_{r,b}$) is presented below:

$$I_{r,b} = \frac{N_{r,b1}}{N_{r,b2}} \cdot 100, \quad (2)$$

where $I_{r,b}$ is the index of enterprise registration (creation) and bankruptcy; $Nr_{,b1}$ is the number of registrations or bankruptcies in the current year; $N_{r,b2}$ is the number of registrations or bankruptcies in the base year.

Interpretation of the index: if $I_{r,b} = 100\%$, it corresponds to the base year level; if $I_{r,b} > 100\%$, it indicates an increase in the number of enterprise registrations (creation) or bankruptcies; if $I_{r,b} < 100\%$, it indicates a decrease in the number of enterprise registrations (creation) or bankruptcies.

The ($I_{r,b}$) index reflects the number of newly registered (created) enterprises per year in the economy or the number of enterprises that ceased operations or declared bankruptcy. It enables the assessment of business environment stability, entrepreneurial activity development, and the level of economic risks across sectors of economic activity. This index is calculated for various sectors of the economy, including industry, trade, construction, financial services, information technology, and other activities. In this study, the ($I_{r,b}$) index covers data for industry, construction, and market services (excluding public administration and defense, compulsory social security, and activities of public organizations).

The synthetic indicator used in this study (level of entrepreneurial stability) represents the ratio between enterprise closures and enterprise creations (*IS*). It reflects the stability of entrepreneurial environment; the balance between market entry and exit of firms; and the degree of business risk in the economy. The (*IS*) indicator is calculated as follows (equation 3):

$$IS = \frac{I_b}{Ir}, \quad (3)$$

where *IS* is the level of entrepreneurial stability; I_b is the index of enterprise bankruptcies; I_r is the index of enterprise registration (creation).

Interpretation of the proposed indicator: if *IS* < 1, the rate of enterprise creation exceeds the rate of bankruptcies, indicating a relatively stable entrepreneurial environment (improving business

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climate, increasing entrepreneurial activity, and rising economic stability); if $IS = 1$, there is a balance between enterprise creation and liquidation (bankruptcy); if $IS > 1$, bankruptcy rates exceed creation rates, indicating increased business risk (worsening economic conditions, higher financial risks, and declining entrepreneurial activity).

The proposed indicator has significant practical value and can be used for analyzing business demography (number of newly created or liquidated enterprises, including through bankruptcy procedures), assessing economic stability across industries and the economy as a whole, studying the impact of macroeconomic factors on business (in this study, FDI is used as such factor), and comparing entrepreneurial development dynamics across countries and economic sectors (this study compares 15 EU member states).

The analysis of the association between FDI as a percentage of GDP (x) and the level of entrepre-

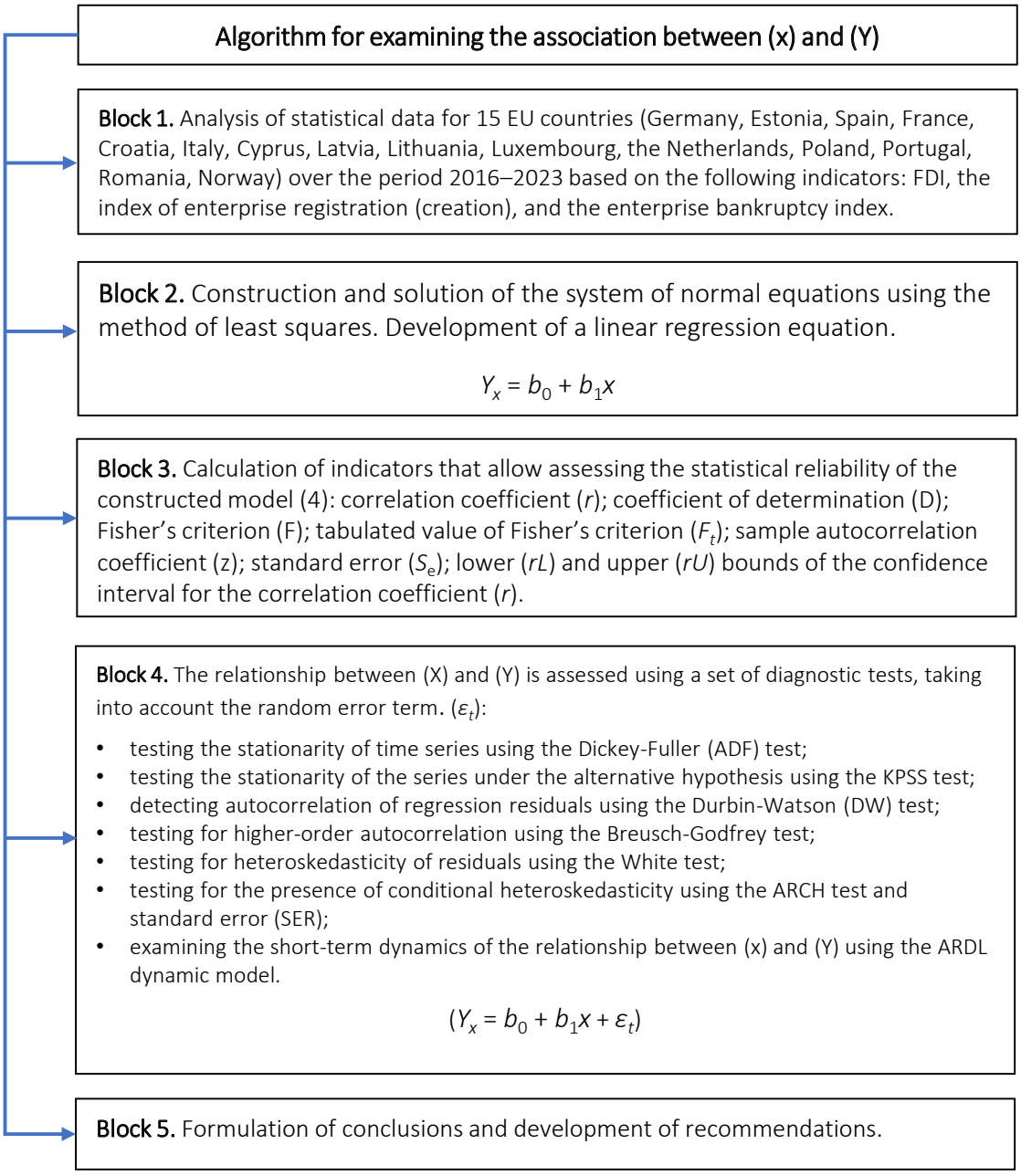


Figure 1. Algorithm for examining the association between the volume of FDI as a percentage of GDP (x) and the level of entrepreneurial stability (Y)

neurial stability (Y) is based on correlation-regression analysis. The application of this method requires fitting a correlation regression equation (Chatterjee & Simonoff, 2013):

$$Y_x = b_0 + b_1 x, \quad (4)$$

where Y_x is the linear equation; b_0, b_1 are model parameters (coefficients); x is the influence factor.

The algorithm for analyzing the association between FDI as a percentage of GDP (x) and entrepreneurial stability (Y) is presented in Figure 1.

The calculation of indicators used to assess the statistical reliability of the constructed model (4) was performed using MS Excel, by applying functions from the corresponding statistical package of MS Excel. The assessment of the relationship between (x) and (Y) through a set of diagnostic tests, taking into account the random error term, was carried out using MS Excel and ChatGPT.

3. RESULTS

3.1. Analysis of the dynamics of enterprise registration, bankruptcies, and FDI inflows as a percentage of GDP in EU countries

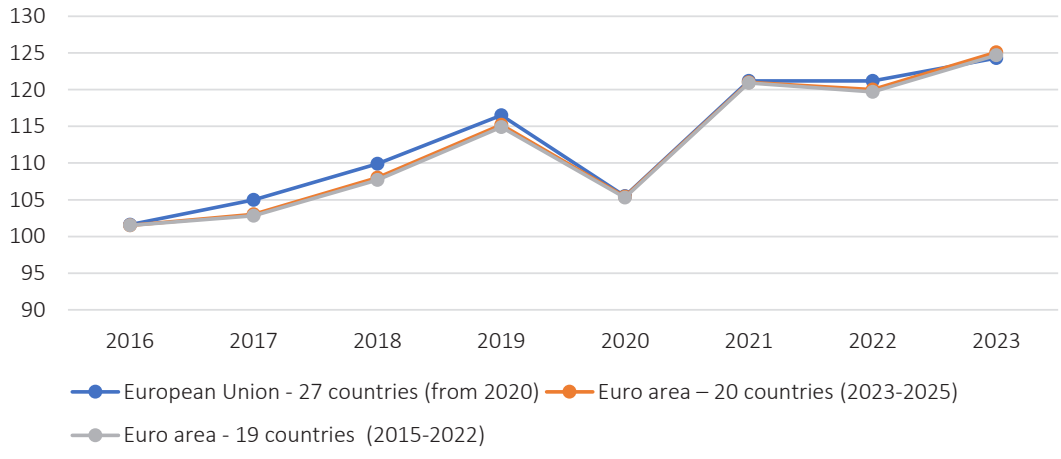
The analysis of the dynamics of enterprise registration in EU countries over the period 2016–2023 is presented in Figure 2.

Figure 2 indicates that EU Member States (EU-27) experienced a steady increase in the enterprise registration index from 101.6% in 2016 to 124.3% in 2023, representing an overall increase of 22.7 percentage points over the period. This growth reflects an intensification of entrepreneurial activity following the COVID-19 pandemic. Similar trends are observed in the Euro area (20(19)), where the enterprise registration index increased from 101.5% to 125% over the same period. These trends indicate a recovery and revitalization of entrepreneurial activity in European countries after the downturn observed in 2020.

The countries with the highest growth rates in newly created enterprises in 2023 compared to 2016 include Croatia (+63.2 p.p.), France (+79.3 p.p.), Lithuania (+48.4 p.p.), the Netherlands (+46.0 p.p.), and Portugal (+43.5 p.p.). These countries demonstrate a strong positive effect of economic recovery and business stimulation, particularly in the small and medium-sized enterprise sector.

The most unstable dynamics, characterized by a decline in enterprise registration over the period 2016–2023, were observed in Ireland (–49.2 p.p.), Germany (–2.0 p.p.), and Latvia (–18.4 p.p.), among others. During 2021–2023, most EU countries demonstrated a positive trend in this index, indicating economic recovery and increased business activity. The strongest growth was observed in Croatia, France, Lithuania, the Netherlands, and Portugal.

Source: Eurostat (2026b).



Note: The base year is 2015.

Figure 2. Dynamics of enterprise registration in EU countries over the period 2016–2023, %

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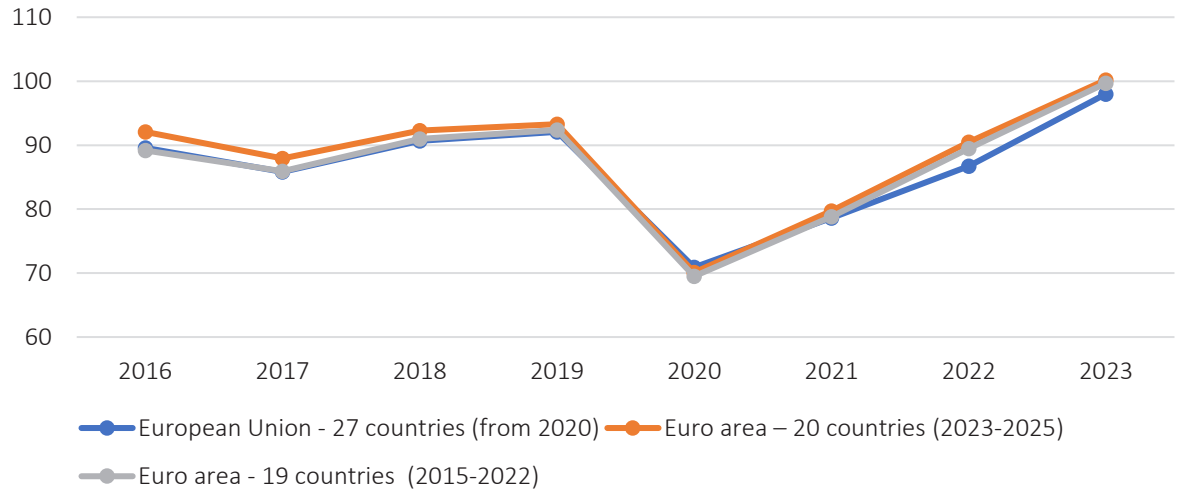
Source: Eurostat (2026b).



Note: The base year is 2015.

Figure 3. Dynamics of enterprise bankruptcies in EU countries over 2016–2023, %

The analysis of the enterprise bankruptcy index across European countries, including the EU-27 and the Euro area 20(19), is presented in Figure 3. The dynamics of enterprise bankruptcies in EU-27 countries over the period 2016–2023 (Figure 3) show that in 2020–2021 the bankruptcy index decreased from 70.9% in 2020 to 78.6% in 2021, while in 2022–2023 it began to increase again. Similar trends are observed in the Euro area 20(19), where the bankruptcy index increased until 2019, followed by a decline in 2020–2021, and a renewed upward trend in 2022–2023. These trends indicate an intensification of entrepreneurial activity in European countries following the downturn in 2020.

Countries with a high level of the bankruptcy index include Croatia (462.6% in 2016 and 164.5% in 2023), Slovakia (78.8% in 2016 and 303.7% in 2023), and Iceland (175.6% in 2016 and 208.0% in 2023).

Countries with a low level of bankruptcies include Romania (45.0% in 2016 and 34.8% in 2023), Cyprus (58.7% in 2016 and 16.3% in 2023), and

Source: Eurostat (2026a).

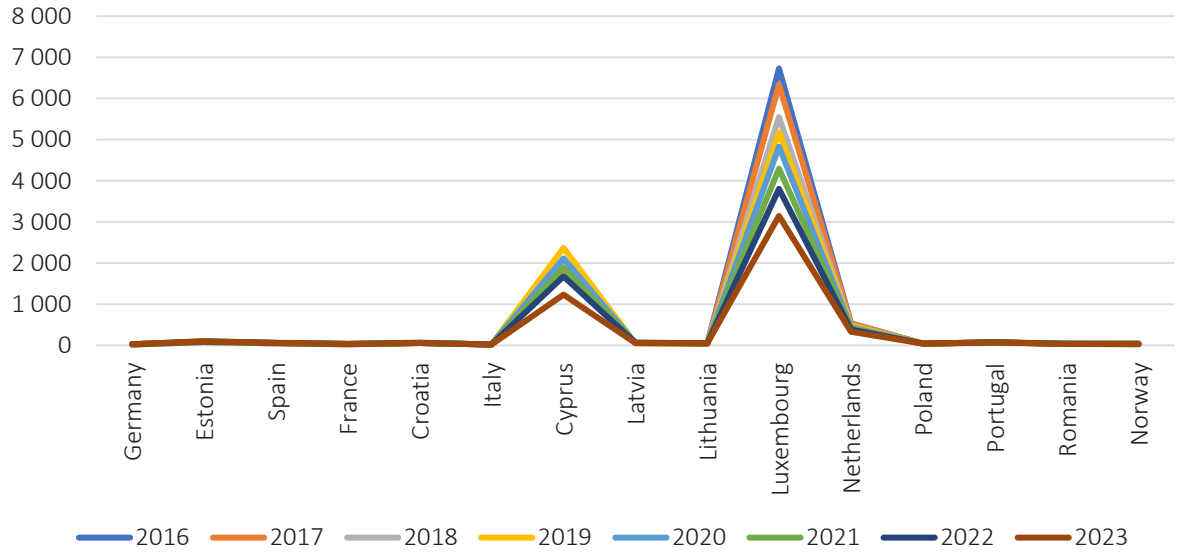


Figure 4. Dynamics of foreign direct investment inflows as a percentage of GDP, %

Portugal (75.7% in 2016 and 44.2% in 2023). Thus, countries characterized by high economic stability include Cyprus, Romania, and Italy, which demonstrate a steady decline in bankruptcy risk. Countries with strong cyclical fluctuations include Slovakia, Iceland, and Croatia, which exhibit high volatility in the bankruptcy index. It is necessary to further examine whether FDI influences the creation of new enterprises, or whether its shortage leads to an increase in bankruptcies. Therefore, the study proceeds with an analysis of foreign direct investment inflows as a percentage of GDP (Figure 4).

The Eurostat database provides statistical data for the respective indicator for the period 2013–2024; however, aggregated data for the EU-27 and the Euro area 20(19) are not available. In addition, data are not reported for all EU countries and are missing for certain years. Therefore, the analysis was conducted for 15 EU countries for which complete datasets were available. Accordingly, the highest values of this indicator are observed in Luxembourg. In 2016, FDI as a percentage of GDP amounted to 6,729%, while in 2023 it decreased to 3,146.2%, and in 2024 to 3,128%. The main reason for such high levels of FDI is that Luxembourg is considered a financial (offshore) hub, where large volumes of investment are associated with international capital flows. Cyprus also demonstrates high values of this indicator. In 2016, FDI as a percentage of GDP amounted to 2,005.2%, while in 2023 it decreased to 1,235.7%, and in 2024 to 1074%. Similarly, Cyprus benefits from offshore investment inflows and financial transaction activities. Countries with low levels of FDI as a percentage of GDP include Germany (values ranging between 23–26%) and Italy (16–23%). Thus, the dynamics of FDI as a percentage of GDP over the period 2016–2023 show that countries such as Iceland, Estonia, and Sweden exhibit an increasing trend in FDI inflows; Cyprus, Luxembourg, Ireland, and the Netherlands demonstrate a decreasing trend; while Poland, Italy, France, Finland, and Germany show relatively stable FDI inflow patterns.

3.2. Analysis of the association between foreign direct investment (FDI) as a percentage of GDP and the level of entrepreneurial stability

In order to examine the association between foreign direct investment (FDI) as a percentage of GDP and the level of entrepreneurial stability in selected European countries, a synthetic indicator of entrepreneurial stability was calculated for selected European countries over the period 2016–2023 based on Eurostat statistical data (Table 1).

Based on the values of the indicators, FDI as a percentage of GDP (x) and the synthetic indicator of

Table 1. Calculation of the synthetic indicator of entrepreneurial stability in selected European countries over the period 2016–2023

Source: Eurostat (2026a, 2026b).

Country	Years							
	2016	2017	2018	2019	2020	2021	2022	2023
Germany	0.988	0.934	0.928	0.916	0.885	0.766	0.809	0.792
Estonia	1.003	0.829	0.727	0.806	0.809	0.493	0.548	0.784
Spain	0.771	0.736	0.716	0.767	0.907	1.610	2.333	3.597
France	0.851	0.851	0.842	0.808	0.586	0.401	0.615	0.771
Croatia	4.327	2.902	1.890	1.290	0.919	1.030	1.125	0.883
Italy	0.856	0.647	0.536	0.489	0.456	0.439	0.319	0.307
Cyprus	0.620	0.581	0.419	0.459	0.462	0.366	0.246	0.192
Latvia	0.981	0.863	0.841	0.821	0.622	0.407	0.510	0.412
Lithuania	1.220	1.250	0.925	0.633	0.311	0.265	0.388	0.353
Luxembourg	1.115	0.892	1.044	1.097	0.998	1.034	1.084	0.970
The Netherlands	0.803	0.609	0.542	0.503	0.439	0.219	0.250	0.366
Poland	0.764	0.689	0.738	0.747	0.779	0.494	0.438	0.517
Portugal	0.752	0.565	0.432	0.362	0.489	0.388	0.273	0.309
Romania	0.470	0.315	0.460	0.478	0.546	0.538	0.202	0.207
Norway	0.988	1.062	1.193	1.171	1.018	0.756	0.983	1.109

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Table 2. Results of the assessment of the association between FDI as a percentage of GDP (FDI%GDP) and the synthetic indicator of entrepreneurial stability (IS)

Country	Regression model	Indicators								
	$Y_x = a_0 + a_1 x$	R	D	F	Ft	z	Se	C_95%	rL	rU
Germany	$Y_x = 1.97 - 0.04x$	–0.73	0.53	2.60	2.45	–0.92	0.45	1.96	–0.95	–0.05
Estonia	$Y_x = 1.67 - 0.01x$	–0.51	0.26	1.46	2.45	–0.56	0.45	1.96	–0.89	0.30
Spain	$Y_x = -3.25 + 0.08x$	0.38	0.14	0.99	2.45	0.40	0.45	1.96	–0.45	0.85
France	$Y_x = 3.09 - 0.07x$	–0.81	0.66	3.33	2.45	–1.11	0.45	1.96	–0.96	–0.23
Croatia	$Y_x = 15.96 - 0.23x$	–0.66	0.44	2.15	2.45	–0.79	0.45	1.96	–0.93	0.08
Italy	$Y_x = 2.63 - 0.10x$	–0.62	0.38	1.93	2.45	–0.72	0.45	1.96	–0.92	0.15
Cyprus	$Y_x = -0.15 - 0.002x$	0.67	0.45	2.22	2.45	0.81	0.45	1.96	–0.06	0.93
Latvia	$Y_x = 3.40 - 0.04x$	–0.90	0.81	5.36	2.45	–1.52	0.45	1.96	–0.98	–0.57
Lithuania	$Y_x = 3.58 - 0.06x$	–0.91	0.83	5.51	2.45	–1.55	0.45	1.96	–0.98	–0.59
Luxembourg	$Y_x = 1.01 - 0.00x$	0.05	0.03	0.20	2.45	0.05	0.45	1.96	–0.68	0.73
The Netherlands	$Y_x = -0.53 + 0.002x$	0.83	0.69	3.61	2.45	1.18	0.45	1.96	0.29	0.97
Poland	$Y_x = 0.09 - 0.033x$	0.11	0.01	0.28	2.45	0.11	0.45	1.96	–0.64	0.76
Portugal	$Y_x = 1.35 - 0.012x$	–0.25	0.06	0.65	2.45	–0.26	0.45	1.96	–0.81	0.55
Romania	$Y_x = -1.77 + 0.05x$	0.74	0.55	2.70	2.45	0.95	0.45	1.96	0.07	0.95
Norway	$Y_x = 0.79 + 0.006x$	0.28	0.07	0.72	2.45	0.29	0.45	1.96	–0.53	0.82

entrepreneurial stability (Y) in selected European countries over the period 2016–2023, the association between them is estimated (Table 2).

To visually support the fitted regression models (Table 2), Figure 5 uses Germany as an example.

For visual support and clearer interpretation of the constructed regression models, a graphical representation was developed using the example of Germany. Germany was selected as a representative case due to the availability of complete statistical data and its significant role in attracting foreign capital inflows, which allows for a more illustrative demonstration of the relationship between the studied variables and entrepreneurial stability in the context of bankruptcy prevention.

According to Figure 5, the line of the mathematical function between FDI as a percentage of GDP ($FDI_{\%GDP}$) and the level of entrepreneurial stability (IS) is linear. Therefore, a linear regression model was selected. The fitted models, provided they are statistically reliable, can be used for forecasting the levels of entrepreneurial environment stability, the balance between the entry and exit of firms

Source: Eurostat (2026a, 2026b).

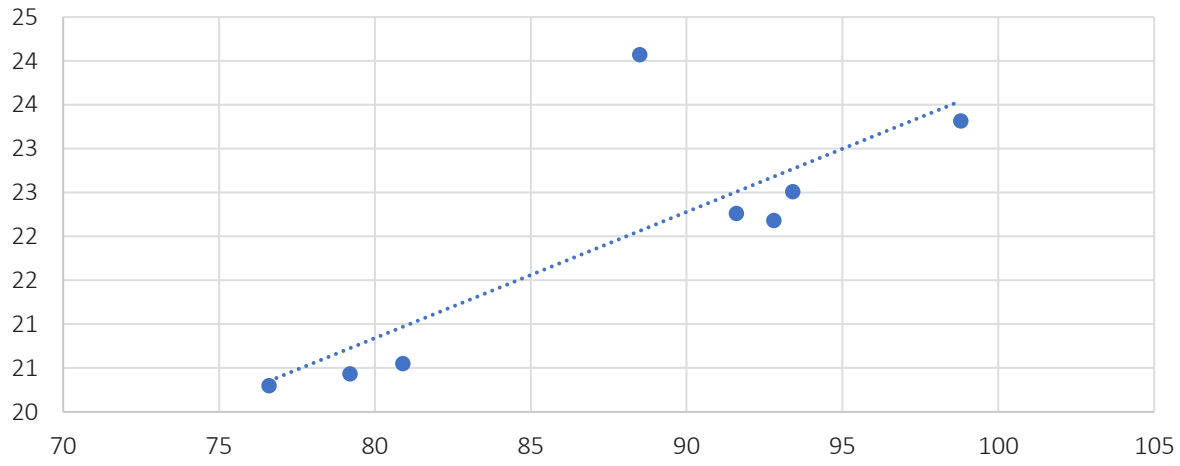

Figure 5. Visualization of the fitted regression models using Germany as an example

from the market, and the degree of business risk within the economy.

The conducted correlation and regression analysis made it possible to group the countries presented in Table 2. The first group includes countries where the association is negative and strong. Such countries include Germany (r = −0.73; D = 0.53; Fisher coefficient (F = 2.60) exceeds the critical (tabulated) value (F_t = 2.45), i.e., ($F > F_t$); z = −0.92; Se = 0.45; C_95% = 1.96; rL = −0.95; rU = −0.05), France (r = −0.81; D = 0.66; Fisher coefficient (F = 3.33; $F > F_t$); z = −1.11; Se = 0.45; C_95% = 1.96; rL = −0.96; rU = −0.23), Latvia (r = −0.90; D = 0.81; Fisher coefficient (F = 5.36; $F > F_t$); z = −1.52; Se = 0.45; C_95% = 1.96; rL = −0.98; rU = −0.57), and Lithuania (r = −0.91; D = 0.83; Fisher coefficient (F = 5.51; $F > F_t$); z = −1.55; Se = 0.45; C_95% = 1.96; rL = −0.98; rU = −0.59).

The second group includes countries with a strong positive association, namely the Netherlands (r = 0.83; D = 0.69; Fisher's coefficient (F = 3.61; $F > F_t$); z = 1.18; Se = 0.45; C_{95}% = 1.96; rL = 0.29; rU = 0.97) and Romania (r = 0.74; D = 0.55; Fisher's coefficient F = 2.70, F > Ft; z = 0.95; Se = 0.45; C_95% = 1.96; rL = 0.07; rU = 0.95).

The third group of countries demonstrates a moderate association between FDI as a percentage of GDP ($FDI_{\%GDP}$) and the level of entrepreneurial stability (IS), including Estonia, Spain, Croatia, Italy, and Cyprus. The fourth group includes countries with a low level of association, namely Luxembourg, Poland, Portugal, and Norway.

Table 3 presents the results of testing the regression models from Table 2 for stationarity (p) using statistical tests.

Table 3 allows the following conclusions to be drawn. The Dickey-Fuller (ADF) test indicated that stationary series ($p < 0.05$) are observed for the following countries: Estonia, Cyprus, Lithuania, Luxembourg, and Norway. Other countries exhibit signs of trend or long-term changes in the data. The KPSS test revealed that a violation of stationarity is observed only for Luxembourg ($p < 0.05$), while for the remaining 14 countries stationarity is not rejected, meaning that most time series can be considered stationary. The Durbin–Watson (DW) test for autocorrelation of residuals showed that positive autocorrelation is present in countries such as Spain, Croatia, Italy, Cyprus, Latvia, Poland, and Portugal. No autocorrelation was detected for Germany, Estonia, France, Lithuania, the Netherlands, Romania, and Norway. The Breusch-Godfrey test for autocorrelation confirmed that Spain is the only country where autocorrelation is statistically significant (p = 0.019), while in other countries it is not statistically confirmed. The White test for heteroskedasticity indi-

Table 3. Results of testing the fitted regression models (Table 2) for stationarity

Country	Indicators (p)										
	ADF	KPSS	DW	BG	White	ARCH	SER	ARDL $Y_x = b_0 + b_1x + \varepsilon_t$			
								β_1	β_2	γ	R^2
Germany	0.35	0.10	1.52	0.75	0.03	0.83	0.05	−0.009	−0.034	0.204	0.91
Estonia	0.00	0.10	1.87	0.81	0.71	0.51	0.15	0.002	−0.017	−0.178	0.83
Spain	0.50	0.10	0.58	0.01	0.41	0.76	1.04	0.003	0.003	1.55	0.99
France	0.06	0.10	2.06	0.58	0.31	0.60	0.10	−0.077	−0.023	−0.238	0.63
Croatia	0.98	0.10	0.84	0.44	0.21	0.76	0.99	−0.006	0.0054	0.676	0.99
Italy	0.70	0.08	0.81	0.27	0.52	0.93	0.15	0.016	0.019	0.786	0.93
Cyprus	0.00	0.10	0.74	0.18	0.63	0.36	0.12	0.0001	0.0001	0.699	0.85
Latvia	0.09	0.10	1.05	0.48	0.38	0.96	0.10	−0.025	0.023	0.807	0.94
Lithuania	0.00	0.10	1.30	0.51	0.02	0.04	0.18	−0.016	0.041	1.100	0.91
Luxembourg	0.00	0.04	2.64	0.18	0.17	0.94	0.08	0.0004	−0.000	−1.300	0.88
The Netherlands	0.45	0.10	1.51	0.83	0.24	0.58	0.12	−0.002	0.003	0.566	0.73
Poland	0.60	0.10	0.84	0.12	0.24	0.12	0.15	−0.029	0.006	0.668	0.42
Portugal	0.61	0.09	0.87	0.41	0.40	0.99	0.16	0.013	−0.016	0.444	0.80
Romania	0.34	0.10	1.49	0.50	0.13	0.10	0.10	0.096	−0.057	−0.168	0.85
Norway	0.00	0.10	1.53	0.35	0.36	0.32	0.14	0.034	−0.011	−0.851	0.44

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cated homoskedasticity (H_0) for countries such as Germany and Lithuania. The ARCH test for conditional heteroskedasticity (H_0) revealed the presence of an ARCH effect only in Lithuania. The standard error of regression (SER) showed that the least accurate model corresponds to Spain, while the smallest errors are observed for models for Germany, Luxembourg, Latvia, and Romania.

The ARDL model assessed the impact of FDI as a percentage of GDP ($FDI_{\%GDP}$) on the level of entrepreneurial stability (IS). The highest inertia and positive lagged effect were observed in Spain ($\beta_1 = 0.0030$; $\beta_2 = 0.0395$; $\gamma = 1.55$). This indicates that the lagged effect of FDI%GDP is positive, and an increase in FDI is likely to stimulate entrepreneurial stability with a time delay. In Croatia ($\beta_1 = 0.0059$; $\beta_2 = 0.0546$; $\gamma = 0.676$), a positive lagged effect of FDI was also recorded. Lithuania demonstrates a significant lagged impact of FDI as well. Overall, the influence of ($FDI_{\%GDP}$) on entrepreneurial stability (IS) is generally weak and tends to manifest with a one–year lag. The dynamics of entrepreneurial stability are characterized by inertia in countries such as Spain, Lithuania, Italy, and Latvia. In contrast, countries such as Luxembourg, Norway, and France exhibit negative inertia effects, indicating fluctuations in business stability. Thus, the fitted models for 15 countries confirm the research hypothesis that there is an association between FDI as a percentage of GDP ($FDI_{\%GDP}$) and the level of entrepreneurial stability (IS). Moreover, the results of statistical testing suggest that $FDI_{\%GDP}$ can have a positive impact on entrepreneurial stability.

4. DISCUSSION

The paper shows that one of the key channels of international capital movement and an important factor of economic development is foreign direct investment (FDI). It provides not only financial resources to national economies but also serves as a driver of entrepreneurship development, particularly by contributing to job creation, the implementation of innovations, and enhancing the financial stability of enterprises, thereby creating conditions for bankruptcy prevention (Chen et al., 2024; Paul & Feliciano-Cestero, 2021; Zhang & Kim, 2022). An important indicator for assessing the state of the entrepreneurial environment is the dynamics of business creation (registration) and liquidation (bankruptcy). These indicators reflect the level of business environment stability, the degree of financial risk faced by enterprises, and the effectiveness of bankruptcy prevention mechanisms. The analysis demonstrates that the average level of new business creation in EU countries and the euro area shows a steady upward trend, despite crisis processes such as the COVID-19 pandemic. In 2020, the pandemic caused a decline in new business registrations. However, the majority of EU and euro area 19/20 countries quickly returned to their pre-pandemic levels of business creation. This indicates the adaptability of the entrepreneurial environment and its capacity to recover from crises without widespread bankruptcies.

Ireland, Latvia, Bulgaria, and Italy demonstrated unstable and declining dynamics in the registration of new enterprises. The statistical data on business bankruptcies reflect the presence of economic shocks and highlight the need to develop effective business support policies, particularly amid external shocks. This also emphasizes the importance of implementing preventive risk management tools aimed at timely bankruptcy prevention and enhancing the resilience of the entrepreneurial sector.

The results revealed the ambiguity of the relationship between FDI as a percentage of GDP and the level of entrepreneurial stability. Although an association between these indicators has been confirmed, it is heterogeneous across countries and exhibits multidirectional effects.

The findings challenge the assumption that FDI automatically has a positive impact on entrepreneurial stability. This supports the principles of institutional theory, which emphasize the context–dependent nature of investment effects. Therefore, FDI should not be considered a universal driver of development, but rather a potentially effective mechanism whose outcomes depend significantly on the quality of the institutional environment.

Regarding the heterogeneity in the association between FDI as a percentage of GDP and the level of entrepreneurial stability, countries with

a negative association were identified (France, Germany, Lithuania, and Latvia). In these cases, an increase in FDI is accompanied by a decrease in entrepreneurial stability. This phenomenon can be explained by the crowding–out effect of domestic businesses by multinational corporations, increased competition leading to a higher number of bankruptcies among non–viable firms, and the reallocation of resources in favor of foreign companies, particularly transnational corporations (TNCs). A positive association was identified, for example, in the Netherlands and Romania. In this case, a positive relationship contributes to stimulating entrepreneurship, improving the business climate, and reducing bankruptcy rates. Here, FDI acts as a catalyst for economic development, supported by effective institutional frameworks, integration of local businesses into global value chains, a well–developed financial system, and a high level of innovation development. In addition, a still open and debatable issue remains the relationship between FDI as a percentage of GDP and entrepreneurial stability when taking into account the impact of crisis factors, particularly the COVID-19 pandemic. The results show that during the period 2020–2021, the number of bankruptcies decreased, partly due to artificial effects caused by government support measures for businesses.

Following the cessation of government support, particularly for non–viable 'zombie firms', the retention of resources, declining business efficiency, and the crowding out of FDI led to an increase in bankruptcies during the 2022–2023 period. This trend indicates the insufficient effectiveness of preventive bankruptcy mechanisms amidst structural economic imbalances. Consequently, future research should test the hypothesis that an inefficient economic structure can neutralize the positive association between FDI as a percentage of GDP and the level of business stability, thereby limiting the capacity for timely bankruptcy prevention and the enhancement of financial resilience. Furthermore, it is essential to address the limitations of the current study: the short time frame (8 years), the lack of a detailed analysis of the sectoral structure of FDI, and the inability to account for endogeneity, which is critical for an accurate assessment of risk factors and the development of effective long–term bankruptcy prevention tools.

CONCLUSION

The study aimed to assess an association between FDI as a percentage of GDP and the level of entrepreneurial stability. The correlation and regression analysis concluded that this association is multidirectional. Specifically, across different countries, the association varies between positive and negative, as well as strong and weak. This variation provided a basis for the systematization and grouping of the countries under study.

The fitted correlation–regression equations for the studied EU countries, along with statistical tests for stationarity, autocorrelation, and heteroskedasticity, as well as the short–term dynamics of the relationship between FDI as a percentage of GDP and the level of entrepreneurial stability, demonstrated that the nature of this association varies across the 15 EU member states. For instance, the highest inertia and a positive lagged effect were recorded in Spain. The lagged effect of FDI is positive, suggesting that growth in FDI likely stimulates business stability with a time delay. Similarly, a positive lagged effect of FDI was observed in Croatia, while Lithuania showed a significant lagged effect.

Consequently, the research hypothesis is partially confirmed. Other factors not addressed in this study, such as institutional quality and a favorable business climate, may serve as effective mechanisms for attracting FDI, which in turn could enhance entrepreneurial activity and mitigate the risk of business liquidation and bankruptcy. Thus, FDI as a percentage of GDP is an objective factor influencing the level of entrepreneurial stability. The fitted regression models can be utilized by countries as a tool for forecasting business stability, specifically for evaluating market trends according to the number of newly created enterprises and business bankruptcies.

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Writing – review & editing: Serhii Kozlovskyi, Tetiana Kulinich, Ivan Zayukov, Liudmyla Nikolenko, Vitalina Puhach.

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