Trade and Investment Connectivity in Europe and the Chinese Influence

Vom Fachbereich IV der Universität Trier zur Verleihung des akademischen Grades Doktorin der Wirtschafts- und Sozialwissenschaften (Dr. rer. pol.) genehmigte Dissertation

von

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Trier, 2026

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Datum der Disputation: 12.02.2026

Acknowledgments

I am deeply grateful to my supervisor, Prof. Xenia Matschke, for giving me the opportunity to undertake this dissertation under her guidance. Her exceptional mentorship, unwavering support, and thoughtful feedback have been invaluable throughout this journey. I am especially thankful for her patience, insightful discussions, and encouragement, which not only guided me through the research process but also inspired me to develop my own ideas and grow as a scholar.

I would like to express my sincere gratitude to Prof. Dr. Andrzej Cieslik from the University of Warsaw, who has supported and encouraged me for many years and is also the official referee of this dissertation. His guidance, generosity, and example have been invaluable in motivating me to pursue research and develop my ideas.

I am also grateful to the professors at Trier University who taught me and provided valuable guidance, in particular Prof. Ludwig von Auer and Prof. Dr. Marc Oliver Rieger, for their advice and support in my research. I would also like to sincerely thank Dr. Lea Shih for her collaboration on my initial project.

Special thanks go to Dr. Daria Suprunenko, M.Sc. A. Timeeva, and Dr. Ngoc Nam Le, whose dedication and example, particularly in successfully defending their own dissertations, inspired me to pursue research.

I would like to thank Dr. Daniel Felten, Faculty Manager at the Dean’s Office, for his invaluable help with the doctoral procedure applications. I would also like to acknowledge the support of the International Office and the Graduate Centre of Trier University for their comprehensive advice and timely financial support during my doctorate.

I am also grateful to Sabine Schneider and Marian Mrfka from the Faculty for their continuous support and assistance with paperwork and organizational matters.

Finally, I wish to express my heartfelt gratitude to my family and friends for their unwavering support, patience, and encouragement during this challenging and demanding journey. Without their understanding, completing this dissertation would not have been possible.

Academic Curriculum Vitae

Publications

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2023	Dorakh, A. Industrial digital interdependence and FDI restrictiveness as determinants of FDI for Eastern European economies. International Politics, 74(1189), 109–131.
2022	Dorakh, A. Trade and FDI connectivity in Europe: The European Union, Western Balkans, and new EU candidate countries. Eastern Journal of European Studies, 13(2), 24–53.
2021	Dorakh, A. FDI determinants in Europe and Chinese influence. Serbian Journal of Management, 16(1), 21–37.
2020	Dorakh, A. Gravity model analysis of FDI across EU member states. Journal of Economic Integration, 35(3), 426–456.
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List of Abbreviations

2SLS	Two-Stage Least Squares
AA	Association Agreement
BRI	Belt and Road Initiative
CEE	Central and Eastern Europe
EV	Electric Vehicles
EEA	European Economic Area
EU	European Union
FE	Fixed-Effects Model
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GDPP	GDP per capita (Gross Domestic Product per capita)
GMM	Generalized Method of Moments
ICT	Information and Communication Technology
KC	Knowledge-Capital Model
MNCs	Multinational Corporations
MRs	Multilateral Resistances
MOUs	Memorandums of Understanding
NMS	New Member States (EU)
OECD	Organisation for Economic Co-operation and Development
PCSE	Panel-Corrected Standard Errors
RE	Random-Effects Model
ULC	Unit Labor Costs
USA	United State of America
WB	Western Balkans
WDI	World Development Indicators

Abstract

This thesis examines how Europe sustains its leadership and competitiveness as a global center for foreign direct investment (FDI) and trade between 1991 and 2023. While EU membership historically functioned as the dominant determinant of inward FDI and trade integration, its relative influence has declined as new structural factors, based on trade dynamics and export-platform strategies, have emerged, together with the growing presence of Asian, especially Chinese, investors establishing production hubs in Central and Eastern Europe to serve the wider EU market. Lower trade costs within Europe have reinforced this shift, leading EU investors to focus on vertical FDI, while non-EU investors to adopt export-platform FDI patterns. Chinese investment has moved from infrastructure-focused projects to strategic-sector FDI, highlighting Europe's exposure to evolving global industrial and geopolitical dynamics.

Chapter 2 examines how traditional determinants of FDI, including EU membership, interact with emerging drivers, such as trade interdependence, export-platform strategies, and Asian influence, to shape investment patterns in Europe. It employs a gravity-based empirical framework augmented with newly developed indicators, comprising the Bilateral Trade Interdependence Index, the Export-Platform Indicator, and Belt and Road Initiative (BRI) participation, together with a functional integration approach, covering over 95% of European countries and their global partners from 2010 to 2023. The findings indicate that trade dependency with non-EU partners grew most rapidly, increasing by 55% between 2011 and 2023. Stronger bilateral trade interdependence is found to significantly predict higher FDI inflows. The BRI analysis and functional classification indicate a shift from infrastructure-focused Chinese investment to strategic sectors, including electric vehicles and semiconductors. Since 2018, export-platform strategies have expanded from Europe's core economies into Central and Eastern Europe, forming emerging production hubs, and have subsequently moved toward the Western Balkans and Turkey, likely reflecting evolving EU regulations and broader supply-chain realignments.

Chapter 3 expands the FDI analysis to cover a longer timeframe, from 1991 to 2017, focusing on the period when EU membership exerted a strong influence on FDI in Europe, transforming member countries from primarily cost-attractive destinations into global investment centers. Using an augmented gravity model covering 39 host and origin countries, the analysis finds that EU membership increased FDI inflows by 23%, with investments from core EU members expanding into new EU member states, while FDI from non-EU countries decreased. At the same time, EU membership may also be driven by trade, and EEA participation reflects non-FDI motivations. The chapter also highlights that EU accession strengthens both market-seeking (horizontal) and

efficiency-seeking (vertical) FDI motives and applies methods to address negative and zero FDI values issues, ensuring robust estimation. The inclusion of lagged and lead variables shows that the EU integration process is phased over time, affecting FDI inflows with lags of up to 10–15 years after accession.

Chapter 4 expands the range of FDI determinants by deriving trade cost indices as a proxy for connectivity and extending the geographic scope of the analysis. In addition to EU members, the sample includes the Western Balkans, Turkey, and new EU candidates and applicants (Moldova, Ukraine, and Georgia) over the period 2000 to 2020, covering approximately 80% of European FDI flows. Trade costs are calculated for each country in the sample with its trade partners, not only within and between European subregions but also with non-EU partners such as China, and are combined with measures of FDI restrictiveness. The results show that China remains among the EU's top three trading partners in goods and that trade costs significantly influence FDI inflows in Europe. The analysis also highlights that declining trade costs between European countries have reduced market-seeking (horizontal) FDI, while non-European investors, especially China, increasingly pursue export-platform FDI to serve third-country markets. A sharp reduction in trade costs between the Western Balkans and the EU (-45%) and a smaller decline with China (-35%) illustrates how regional integration reduces the need for local horizontal FDI while reinforcing Europe's role as a hub for global production.

Chapter 5 shows that despite concerns about increasing outside influence, developed European countries remain the dominant source of FDI in the region. The chapter focuses on China's role, examining FDI patterns across advanced EU members, new member states, and Western Balkan economies between 2000 and 2019, while distinguishing the effects of EU integration and BRI participation on FDI. Chinese influence has expanded primarily through the Belt and Road Initiative, particularly in accession and neighboring countries. Although BRI participation does not significantly increase FDI on its own, reflecting the dominant part of loan-financed infrastructure rather than private investment, it has strengthened physical and digital connectivity, laying the groundwork for future, longer-term FDI. The analysis also shows that intra-EU trade costs declined significantly after the 2004 and 2007 enlargements, while trade costs between the Western Balkans and China have fallen steadily since the launch of the BRI in 2013. As a result, Chinese influence is more pronounced in new EU member states and Western Balkan economies than in Western Europe. Over time, enhanced connectivity and supply-chain integration may support more diversified FDI inflows.

Zusammenfassung

Diese Dissertation untersucht, wie Europa im Zeitraum von 1991 bis 2023 seine führende Rolle und Wettbewerbsfähigkeit als globales Zentrum für ausländische Direktinvestitionen (FDI) und Handel aufrechterhält. Während die EU-Mitgliedschaft historisch als zentraler Bestimmungsfaktor für eingehende FDI und Handelsintegration fungierte, hat ihr relativer Einfluss nachgelassen, da sich neue strukturelle Faktoren herausgebildet haben, die auf Handelsdynamiken und Exportplattform-Strategien beruhen. Gleichzeitig nimmt die Präsenz asiatischer, insbesondere chinesischer Investoren zu, die Produktionsstandorte in Mittel- und Osteuropa errichten, um den breiteren EU-Markt zu bedienen. Sinkende Handelskosten innerhalb Europas haben diesen Wandel verstärkt, indem sie EU-Investoren zu vertikalen FDI und Nicht-EU-Investoren zu exportorientierten FDI-Modellen veranlasst haben. Chinesische Investitionen haben sich von infrastrukturfokussierten Projekten hin zu strategischen Sektoren entwickelt und verdeutlichen damit Europas zunehmende Verwundbarkeit gegenüber globalen industriellen und geopolitischen Veränderungen.

Kapitel 2 untersucht, wie traditionelle Determinanten von FDI, einschließlich der EU-Mitgliedschaft, mit neuen Einflussfaktoren – wie Handelsverflechtung, Exportplattform-Strategien und asiatischem Einfluss – interagieren und dadurch Investitionsmuster in Europa prägen. Grundlage bildet ein gravitationsbasiertes empirisches Modell mit neuen Indikatoren, darunter der bilaterale Handelsverflechtungsindex, der Exportplattform-Indikator sowie die Teilnahme an der Belt and Road Initiative (BRI) und ein Ansatz funktionaler Integration. Der Datensatz umfasst über 95 % der europäischen Länder und ihre globalen Partner von 2010 bis 2023. Die Ergebnisse zeigen, dass die Handelsabhängigkeit von Nicht-EU-Partnern am stärksten zunahm (um 55 % zwischen 2011 und 2023). Eine stärkere bilaterale Handelsverflechtung erhöht signifikant die Wahrscheinlichkeit steigender FDI-Zuflüsse. Die BRI-Analyse weist einen Wandel chinesischer Investitionen von Infrastruktur- hin zu strategischen Sektoren wie Elektrofahrzeugen und Halbleitern nach. Seit 2018 haben sich Exportplattform-Strategien von den Kernländern der EU nach Mittel- und Osteuropa und anschließend in den Westbalkan und die Türkei verlagert – ein Hinweis auf sich entwickelnde EU-Regulierungen und globale Anpassungen in Lieferketten.

Kapitel 3 erweitert die Analyse auf den Zeitraum 1991 bis 2017, in dem die EU-Mitgliedschaft einen besonders starken Einfluss auf FDI in Europa ausübte und Mitgliedstaaten von primär kostenorientierten Standorten zu global bedeutenden Investitionsstandorten transformierte. Ein erweitertes Gravitationsmodell mit 39 Herkunfts- und Zielländern zeigt, dass EU-Mitgliedschaft FDI-Zuflüsse um 23 % erhöhte, wobei Investitionen aus Kern-EU-Staaten in neue Mitgliedsländer zunahmen, während

FDI aus Nicht-EU-Staaten zurückging. Gleichzeitig kann die EU-Mitgliedschaft auch handelsgetrieben sein, während die Teilnahme am EWR überwiegend nicht-FDI-bezogenen Zielen dient. Das Kapitel zeigt, dass EU-Beitritte sowohl markt- als auch effizienzorientierte FDI stärken und wendet Methoden zur Behandlung negativer und nullwertiger FDI-Daten an. Die Berücksichtigung zeitlicher Vor- und Nachlaufeffekte belegt, dass Integrationsprozesse gestaffelt wirken und FDI noch 10–15 Jahre nach dem Beitritt beeinflussen.

Kapitel 4 erweitert die Bestimmungsfaktoren von FDI um Handelskosten-Indizes als Maß für Konnektivität und umfasst neben EU-Mitgliedstaaten auch die Westbalkanländer, die Türkei sowie neue EU-Kandidaten und Bewerber (Moldau, Ukraine und Georgien) im Zeitraum 2000–2020, insgesamt rund 80 % der europäischen FDI-Ströme. Handelskosten werden für jedes Land im Verhältnis zu seinen Partnern innerhalb Europas und gegenüber Nicht-EU-Ländern wie China berechnet und mit FDI-Restriktivitätsmaßen kombiniert. Die Ergebnisse zeigen, dass China weiterhin zu den drei wichtigsten Handelspartnern der EU gehört und dass Handelskosten einen bedeutenden Einfluss auf FDI-Zuflüsse haben. Sinkende Handelskosten innerhalb Europas reduzierten marktorientierte (horizontale) FDI, während Nicht-EU-Investoren – insbesondere China – zunehmend exportorientierte FDI tätigen, um Drittlandmärkte zu bedienen. Der starke Rückgang der Handelskosten zwischen dem Westbalkan und der EU (-45 %) sowie ein moderater Rückgang mit China (-35 %) verdeutlichen, wie regionale Integration die Notwendigkeit lokaler horizontaler FDI verringert und Europas Rolle als globales Produktionszentrum stärkt.

Kapitel 5 zeigt, dass trotz Befürchtungen über wachsenden externen Einfluss entwickelte europäische Staaten weiterhin die wichtigsten Herkunftsländer für FDI in der Region bleiben. Der Fokus liegt auf Chinas Rolle und den Unterschieden zwischen fortgeschrittenen EU-Staaten, neuen Mitgliedern und Westbalkan-Ländern im Zeitraum 2000–2019. Chinas Einfluss nahm vor allem über die Belt and Road Initiative zu, insbesondere in Beitritts- und Nachbarstaaten. Zwar führt die BRI-Teilnahme allein nicht zu signifikant höheren FDI-Zuflüssen – da sie überwiegend kreditfinanzierte Infrastrukturprojekte umfasst –, stärkt jedoch physische und digitale Konnektivität und schafft langfristig Voraussetzungen für mehr private Investitionen. Nach den EU-Erweiterungen 2004 und 2007 sanken die inner-europäischen Handelskosten deutlich; Handelskosten zwischen dem Westbalkan und China gingen seit Beginn der BRI 2013 ebenfalls zurück. Dadurch ist Chinas Einfluss in neuen EU-Mitgliedstaaten und Westbalkan-Ländern stärker ausgeprägt als in Westeuropa. Langfristig könnten bessere Konnektivität und Lieferkettenintegration zu diversifizierteren FDI-Zuflüssen führen.

1 Introduction

Foreign direct investment (FDI) and trade are not only engines of economic activity but also central mechanisms through which Europe has strengthened its international competitiveness and consolidated its influence in the global economy, particularly in times of increasing uncertainty.

This thesis examines the changing patterns and determinants of FDI, covering approximately 95% of European countries and their global partners from 1991 to 2023, a period marked by the expansion of global value chains, EU enlargement, and rising geopolitical and regionalization pressures. The long observation period makes it possible to capture the full spectrum of trends, from the globalization-driven integration of the 1990s and early 2000s to more recent tendencies toward reshoring, diversification, and regionalization in shaping investment patterns.

Focusing on trade connectivity, institutional frameworks, trade interdependence indices, EU membership, functional country classifications, as well as Asian influence and export-platform indicators, the analysis highlights how regional integration and strategic positioning have increasingly shaped FDI flows. Moreover, the thesis illustrates that geopolitical developments are reshaping FDI patterns in Europe, with indirect effects transmitted through closely connected regional supply chains, trade interdependencies, and external shocks. As a result, trade and FDI interact dynamically, acting as substitutes or complements depending on country-specific contexts, highlighting the need to analyze trade and FDI jointly.

Against this backdrop, the aim of this thesis is to examine the evolution and determinants of FDI and trade flows in Europe from 1991 to 2023. Particular attention is given to the changing role of EU membership, trade interdependence, connectivity, and Chinese FDI, including through the Belt and Road Initiative (BRI), which is analyzed as a key framework shaping China's economic engagement with European countries.

Building on this, an additional contribution of the thesis is to compare how these determinants—EU membership, trade interdependence and connectivity, export orientation, and Chinese investment, including BRI participation—have evolved in significance and interacted across different periods, reflecting shifting regional integration dynamics and geopolitical conditions.

The study also considers how these factors, together with geopolitical developments, have shaped the transformation of FDI motives from horizontal and vertical strategies toward export-platform strategies, as well as trade patterns toward diversification. This aim of the thesis is addressed across five chapters of the thesis.

Chapter 2 contributes to the literature on trade and FDI by examining, beyond gravity factors, how trade interdependence, export potential, EU membership, and Chinese influence have shaped FDI inflows into Europe between 2010 and 2023. It assesses the extent of functional economic integration beyond formal EU membership and analyzes whether FDI flows were primarily driven by market access or by export-platform strategies, particularly in the case of Asian investment. Methodologically, it employs an augmented gravity model of FDI, using data on 42 European host countries and 40 global origin countries over the period 2010–2023. Estimation is conducted using OLS with high-dimensional fixed effects (reghdfe) for robustness checks, and Poisson Pseudo-Maximum Likelihood (ppmlhdfe) to account for zero FDI flows and heteroskedasticity, providing more reliable estimates of FDI determinants.

Building on a trade-based framework, the analysis introduces two novel explanatory variables: the Bilateral Trade Interdependence Index, which captures the depth of trade relationships, and the Export-Platform Indicator, which identifies the extent to which FDI is motivated by third-market access. For instance, Non-EU–Non-EU pairs exhibit the fastest growth rate in trade interdependence, increasing by approximately 55% from 2011 to 2023. This rapid expansion highlights the growing economic integration and increasing trade flows among non-EU countries, including emerging hubs such as Turkey, Serbia, and other Balkan states, as well as rising Asian origins in Europe.

A rank-based approach is employed to evaluate the intensity of trade interdependence between country pairs. Rankings from 1 to 5 reveal that the fastest-growing trade interdependence is occurring outside the traditional core of EU-to-EU trade links, driven notably by non-EU countries both within Europe and beyond. Thus, we introduce a novel classification of sample countries and define distinct FDI periods to capture phase-specific dynamics in investment flows. In addition, BRI participation is examined as a driver of FDI through infrastructure and trade facilitation. At the same time, we analyze newer trends in Chinese investment in strategic sectors in Europe to capture how these investments target emerging hubs beyond the traditional BRI focus. This approach allows us to examine how bilateral FDI patterns, including Chinese influence in Europe, vary across regions, and investment cycles.

The empirical results confirm that stronger bilateral trade interdependence significantly predicts higher FDI inflows for Europe Core hosts across all origins, while Emerging Hubs remain particularly linked to Asia in the recent period. The BRI analysis and functional classification highlight a shift from early infrastructure-focused Chinese investment to a newer wave of strategic-oriented FDI in Europe. The export-platform strategies, initially concentrated in Europe’s core economies, have since 2018 shifted toward Emerging Hubs. However, while EU-based Emerging Hubs have largely matured as export-oriented bases, new Chinese FDI increasingly targets non-EU Emerging Hubs such as Turkey, Serbia, and Albania, possibly reflecting evolving EU regulations and supply chain realignments.

Chapter 3 contributes to the literature by analyzing the role of EU membership as a determinant of FDI inflows, showing how between 1991 and 2017 it shifted from serving mainly as a magnet for cost-advantage FDI toward becoming a strategic investment hub. Using an augmented gravity model that extends beyond standard gravity variables and covering 39 host and origin countries, the analysis shows that inflows increased by 23% during this period in Europe, with FDI from core EU member countries to new EU member states expanding, while investment from non-EU member countries declined. The analysis shows that EU membership has a strong and positive effect on FDI inflows, confirming that joining the EU significantly increases investment into member states. For accession countries, EU membership highlighted market-seeking (horizontal) and efficiency-seeking (vertical) motives as the most relevant determinants of FDI.

Methodologically, the chapter addresses negative FDI flows by transforming them to a minimal positive value ($1) to preserve consistency. Estimates for both negative-eliminating and transforming-negatives models show that dropping negatives introduces bias, while treating them as $1 produces stronger results.

One of the main contributions of Chapter 3 is the inclusion of a comprehensive set of fixed effects, covering host-time, origin-time, and pair-fixed effects. In particular, the pair-fixed effects allow for observing FDI flows both before and after the official EU enlargement, providing a clearer understanding of how EU membership influenced investment patterns. Another contribution of Chapter 3 is the application of lagged and lead variables, which are widely used in the trade literature (Baier et al., 2019; Yotov et al., 2016) but remain rare in FDI research. The results confirm that the impact of EU membership on FDI is phased in over time, with significant lagged effects persisting for 10–15 years after integration.

Chapter 4 examines how connectivity, measured through trade cost indices, shapes European trade and FDI with EU enlargement and geopolitical pressures between 2000 and 2020, focusing on EU member states, Western Balkan economies, and the new EU candidates and applicants (Ukraine, Moldova, and Georgia). The analysis integrates macro-economic, institutional, and digital indicators, along with EU membership and Association Agreements, into an extended FDI model to distinguish the effects of intra-European and extra-European connectivity. To quantify connectivity, trade cost indices adjusted for FDI restrictiveness are calculated from observable bilateral trade data for each country and its partners, following the methodology of Novy (2013). Trade costs are also computed between subregions and their European (EU) and non-European partners (China), using average aggregate trade costs over multiple years. The indices are then disaggregated at the subregional level, distinguishing between the EU, the Western Balkans, and the new EU candidate and applicant countries.

Methodologically, the chapter applies the difference Generalized Method of Moments (GMM) estimator for linear dynamic panels proposed by Kripfganz (2020), and complements this approach with cross-sectional dependence tests, second-generation unit root, cointegration procedures, and causality tests between FDI and GDP per capita.

The empirical analysis indicates that both aggregate trade costs to the rest of the world and disaggregated trade costs within and between European subregions significantly influence FDI inflows.

The results show that declining trade costs within Europe reduce market-seeking (horizontal) FDI, as firms no longer need to "jump tariffs" by establishing local production. In contrast, non-European investors, particularly China, are increasingly motivated by export-platform strategies, using Europe as a base for serving third-country markets, especially when trade costs or investment restrictions rise between China and partners in the region. One of the main contributions of this chapter is to demonstrate, based on calculated trade cost indices and empirical evidence, that China remains among the EU's top three trading partners in goods and is also a major source of infrastructure-focused FDI across Europe. The chapter further explores how recent shifts in EU–China relations and increasing trade frictions may reshape intra-European FDI dynamics. A substantial reduction in trade costs between the Western Balkans and the EU (-45%) underscores significant progress in regional integration, while the smaller decline with China (-35%) indicates that Europe remains relatively more integrated internally. This divergence supports a shift from market-seeking FDI within Europe toward greater export-platform activity linked to global value chains.

Chapter 5 analyzes FDI patterns across 34 countries, including EU-28 and six Western Balkans economies, covering about 89% of total European FDI between 2000 and 2019. The chapter examines how connectivity, regional characteristics, EU, and BRI integration influence FDI. The findings highlight that determinants of FDI vary across countries and over time, with traditional factors increasingly shaped by technology, infrastructure development, declining trade costs, and the rise of Asian multinational networks. Since several countries joined the EU as new member states or candidates, FDI inflows have risen sharply, making EU membership a key driver of investment; however, EU membership does not have a uniform effect across the continent. Chinese investment under the Belt and Road Initiative (BRI) has grown since 2013, primarily in export-oriented, asset- and market-seeking projects, although its direct effect on FDI remains limited, as many BRI projects are loan-financed infrastructure initiatives rather than private investment.

Trade costs, as a proxy for connectivity, play a central role in shaping FDI patterns. Intra-EU trade costs declined after the 2004 and 2007 enlargements, benefiting new EU members, while trade costs with China remain higher for the Western Balkans but have gradually decreased since the BRI. Lower trade costs correlate with higher FDI, particularly for EU-13 countries, whereas the Western Balkans remain more dependent on FDI to facilitate trade. Specifically, a 10% reduction in trade costs between the new EU member states and China is associated with a 9.4% increase in FDI for EU-13 countries, compared to a 2.4% increase for the Western Balkans.

The results indicate that FDI inflows in Europe are positively linked to market size (GDP), while the influence of GDP per capita, labor costs, and human capital varies across regions. In the EU-28 and new member states, lower GDP per capita and unit labor costs support horizontal and efficiency-seeking FDI, whereas in the Western Balkans, higher values of these variables point to vertical and skill-intensive investment. Thus, FDI motivations and the relative importance of factor endowments differ across countries and evolve over time. Overall, the findings underscore that connectivity, regional characteristics, and institutional integration critically shape FDI patterns in Europe, with new EU member states and candidate countries increasingly emerging as key investment centers.

Chapter 5 ties together the previous findings, illustrating how FDI motives have evolved over time and across regions. While *Chapter 2* shows that, in the recent period, EU membership alone is no longer a sufficient determinant or classifier of FDI—necessitating functional measures such as trade interdependence and export-platform indicators to capture heterogeneous host roles—*Chapter 3*, focusing on an earlier timeframe, highlights that EU membership was historically a primary driver of FDI, offering clear market- and efficiency-seeking advantages to accession EU countries. *Chapters 3 and 5*, covering the period from 1991 onward, emphasize the benefits of EU accession for attracting FDI and the enduring relevance of institutional membership. Trade costs and connectivity between the European countries and their partners, analyzed in *Chapters 4 and 5*, further distinguish Central and Eastern Europe as key FDI hosts, which have recently emerged as the main Emerging Hubs for FDI, particularly from Asia. Moreover, across all chapters, Chinese influence on European FDI is evident, showing a shift from early BRI infrastructure-focused investment to a more recent wave of strategic, sector-oriented FDI.

Overall, the analysis demonstrates that European FDI motives have transitioned from conventional market- and efficiency-seeking forms toward more complex export-platform networks shaped by regional integration, country-specific strategies, and evolving global trade and geopolitical dynamics. Understanding these dynamics is crucial for policymakers seeking to navigate and strategically position their countries or firms within regional and global value chains.

2 FDI, Trade Interdependence, and Functional Integration: The Role of EU Membership and Asian Investment

2.1 Introduction

With rising trade protectionism, geopolitical tensions, and supply chain disruptions, FDI and trade are undergoing a significant transformation in Europe. While the EU single market remains a key strategic asset for economic resilience and competitiveness, traditional advantages of EU membership in attracting FDI are declining. Although EU countries historically accounted for a large share of global FDI inflows, by 2023 the share of core EU countries had fallen to around 1%, the lowest among all world regions. This decline challenges traditional assumptions that market size and EU membership alone determine FDI. Instead, supply chain–intensive manufacturing FDI is increasingly flowing to non-core EU countries, emerging EU hubs in Central and Eastern Europe, the Balkans, and other locations such as Turkey, reflecting broader trade and investment policy developments that are reshaping FDI patterns (World Investment Report, 2025).

Building on these trends, this study distinguishes new drivers of investment dynamics, including trade interdependence, export-platform orientation, and global supply chain reconfigurations involving China, which increasingly influence FDI location choices across Europe. To quantify these effects, we develop a Bilateral Trade Interdependence Index that goes beyond aggregate trade volumes to capture mutual dependency and functional economic integration, even among non-EU countries. In addition, we construct an Export-Platform indicator to measure the extent to which host countries serve as bases for foreign investors' export-oriented activities.

While deeper trade ties are reinforcing the leadership role of core EU countries within the region, new EU member states and candidates are shifting from passive FDI recipients to active connectors, increasingly serving as production hubs (Table 2.1).

Table 2.1: Strategic Motivations Behind Country Group Roles in Europe

Group / Country	Key Reasons
EU Core Countries	Reinforce internal integration. Enable adaptation to shifting intra-EU flows. Support leadership and global competitiveness
New EU Members	Opportunity to move from passive recipients to active economic connectors. Countries that initially attract market-access driven FDI increasingly act as export platforms and regional integration hubs
Candidate Countries (Turkey, Western Balkans, Moldova)	Strategic trade partners with strong EU ties, less regulated countries have the potential to become production and regional supply chain hubs, integrating into broader EU networks
Asian partners (China, South Korea, Japan, Singapore)	Diversify supply chains to strengthen resilience and maintain global competitiveness

Source: Author's own analysis.

Eastern and Southern Europe have enhanced their appeal as emerging hubs, bolstered by recent trade shifts and supply chain realignments (World Investment Report, 2025). A ranking of trade interdependence between country pairs from 2010 to 2023 reveals that the fastest-growing interdependence occurs outside traditional EU core pairs, with countries such as Hungary, Romania, Serbia, and Turkey emerging as particularly attractive FDI destinations, especially for Asian countries. This pattern demonstrates that functional economic integration in Europe increasingly extends beyond formal institutional boundaries. Thus, we introduce a novel classification of sample countries and define distinct FDI periods to capture phase-specific dynamics in FDI.

In addition, Belt and Road Initiative (BRI) participation is analyzed as a potential driver of FDI, while more recent Chinese investment increasingly targets strategic sectors, contributing to the establishment of emerging production hubs. This shift indicates that BRI-related infrastructure investment has been partly replaced by a new wave of manufacturing-oriented FDI, a distinction further explored in our comparative analysis.

To better understand the motivations behind FDI location choices, we distinguish between two primary drivers: market-access FDI and export-platform FDI. The Trade Interdependence Index reflects the strength of direct economic ties between an origin and a host country and is used as a proxy for market-seeking investment. In contrast, the Export-Platform Indicator captures a host country's capacity to serve as a base for re-exports to third markets. This dual framework also enables us to assess whether trade and FDI act as complements or substitutes. As a result, this study contributes to the literature by showing that, instead of pursuing traditional tariff-jumping strategies, firms have increasingly redirected FDI to third countries as export platforms to access protected markets indirectly.

Based on this approach, we address the following research questions: Do trade linkages explain FDI inflows in Europe? Is there functional economic integration beyond formal EU membership? Are FDI flows primarily driven by market access or by export-platform strategies, particularly for investments originating from Asia? How do Chinese FDI patterns, both BRI-related and in strategic sectors, affect bilateral FDI flows in Europe?

To address these questions, we employ a gravity model of FDI for 42 European host and 40 global origin countries from 2010 to 2023, augmenting traditional determinants with indices developed for this study, including the Bilateral Trade Interdependence Index, the Export-Platform Indicator, BRI participation, and measures of functional integration, to account for emerging drivers of FDI.

This chapter proceeds as follows. Section 2 reviews the literature and develops the conceptual framework. Section 3 presents the data and descriptive analysis. Section 4 outlines the empirical strategy and presents the results. Finally, Section 5 concludes with policy implications and suggestions for future research.

2.2 Literature Review

Although a large body of literature has explored the interplay between trade and FDI, the nature of their relationship remains ambiguous and context-dependent (Maurseth, Masso, and Holmen, 2025). Some studies highlight complementarities, while others find substitution effects depending on industry, geography, and time period (Pontes, 2004). Martinez-San Roman et al. (2012) suggest that EU trade integration and FDI reinforce each other, thus being complements rather than substitutes in the EU context.

Bergstrand and Paniagua (2024) offer a particularly valuable contribution by employing a novel methodological approach to isolate the effects of individual provisions (e.g., tariff reductions) within deep trade agreements on both trade and FDI flows. Using the World Bank's DTA database, their findings reveal that certain liberalizing provisions may boost trade while discouraging FDI, and vice versa. This underscores that the relationship between trade and FDI is not fixed but can be shaped as either substitutive or complementary by the specific institutional design of trade agreements—highlighting the need to analyze trade and FDI flows jointly rather than in isolation.

Recent research has shifted toward understanding the role of trade policy uncertainty, especially tariffs. While most studies on tariffs and FDI focus on "tariff-jumping" FDI (Kahn, Liao, and Zheng, 2024; Castelli et al., 2025) —where firms establish local operations to bypass import duties—our approach centers on a broader and more strategic relocation of FDI to third countries in response to trade frictions between origin and host economies. This distinction is crucial: rather than viewing tariffs solely as a barrier firms circumvent by investing directly in the target market, we explore how firms use third countries as export platforms to access protected or geopolitically sensitive markets indirectly.

Several scholars have explored the impact of EU integration on FDI relations within Europe (e.g., Egger & Pfaffermayr, 2004; Bruno et al., 2020; Grieveson et al., 2021; Meinhart, 2024). Camarero, Moliner, and Tamarit (2024) offer a valuable and timely contribution by analyzing how European monetary integration has shaped FDI patterns. While they capture the 'euro effect' based on currency and monetary integration, we use trade-based metrics to evaluate the impact of EU integration on FDI.

Aiyar, Malacrino, and Presbitero (2024) demonstrate that geopolitical alignment significantly influences the direction of FDI flows, particularly during periods of heightened global tension. Their findings highlight the importance of political interdependence in shaping investment decisions. Our paper complements this perspective by introducing a Bilateral Trade Interdependence Index, which captures the economic dimension of interdependence. While Aiyar et al. (2024) focus on geopolitical ties, we offer a functional economic lens, allowing us to examine how sustained trade relationships foster investment patterns independently of formal political alliances. This allows us to identify strategic integration effects not only among EU member states but also across non-EU countries and emerging alignments, such as Norway and Turkey.

The gravity model has long served as a leading framework for explaining FDI flows by considering factors such as market size, distance, and institutional ties. This approach aligns with numerous studies that quantify the effects of various determinants on FDI (e.g., Blonigen and Piger, 2014; Kox and Rojas-Romagosa, 2020; Ramanayake, 2025) and incorporates recent advances in trade gravity literature (Larch and Yotov, 2025).

Based on the methodological recommendations of Larch, Shikher, and Yotov (2025), our analysis employs the Poisson Pseudo Maximum Likelihood (PPML) estimator to address heteroskedasticity in bilateral FDI data and to incorporate zero FDI flows. To mitigate potential endogeneity and omitted variable bias, in addition to our constructed Bilateral Trade Interdependence Index and Export-Platform Indicator, we include a rich set of fixed effects: origin-time and host-time fixed effects, ensuring a more robust identification of the relationship between trade and FDI.

While the concept of export-platform FDI is not new, empirical applications have often centered on non-European contexts. Ekholm, Forslid, and Markusen (2007) provide a theoretical framework for export-platform FDI, where multinational firms invest in a host country not to serve its domestic market, but to re-export to third countries. Ito (2013) builds on this by offering foundational empirical evidence, showing that a significant portion of U.S. outward FDI is directed toward export-platform strategies, especially within North American regional production networks. However, comparable empirical evidence remains limited for Europe, where the role of countries—both within and outside the EU—as re-export platforms has been underexplored. Our study extends this line of inquiry by developing a novel Export-Platform Indicator tailored to the European context. This indicator specifically accounts for European distances, trade costs, and regional integration patterns, capturing the extent to which host countries serve as emerging production hubs for accessing third markets. For other regions, such as Asia, both distance measures and the associated parameters would need to be adjusted to reflect different geographic and economic conditions.

Tamberi (2023) exploits the 2016 Brexit referendum as a natural experiment to investigate how trade policy uncertainty influences FDI. Using data on greenfield manufacturing FDI projects in the UK, the study shows that anticipated barriers to EU market access led to a decline in FDI. This evidence highlights the importance of export-platform considerations in FDI decisions. While Tamberi focuses on the UK's post-Brexit context, our study builds on this perspective by introducing a systematic framework to measure export-platform potential and trade interdependence across a wider set of European countries, including both EU members and their external partners.

Moreover, to address potential endogeneity, a persistent challenge in trade–FDI studies (Blonigen & Piger, 2014), we construct a rank-based instrument using the relative position of the host country's Export-Platform Indicator.

Chinese FDI in Europe is often associated with the Belt and Road Initiative (BRI), launched in 2013. While early studies primarily emphasize infrastructure investment (Chen, 2018; Yu, Qian, & Liu, 2019), more recent research highlights a gradual diversification of Chinese FDI toward strategic sectors (Casarini, 2024; Nedopil Wang, 2025). However, the effects of the BRI are heterogeneous: participation in the initiative has been found to be negatively correlated with Chinese investment in advanced economies (Yu, Qian, & Liu, 2019), and evidence suggests that its impact on FDI typically materializes only after a lag of five to seven years (Todo, Nishitateno, & Brown, 2025). This study incorporates both perspectives by analyzing BRI participation as a potential driver of FDI through infrastructure and strategic-sector investment, thereby capturing how these flows increasingly target emerging European hubs the scope of the BRI.

Moreover, while Boeckelmann et al. (2024) analyze FDI fragmentation through the lens of geopolitical blocs—grouping countries into Western (U.S.-aligned), Eastern (China-aligned), and Neutral blocs—our approach instead focuses on the functional roles countries play in global production networks.

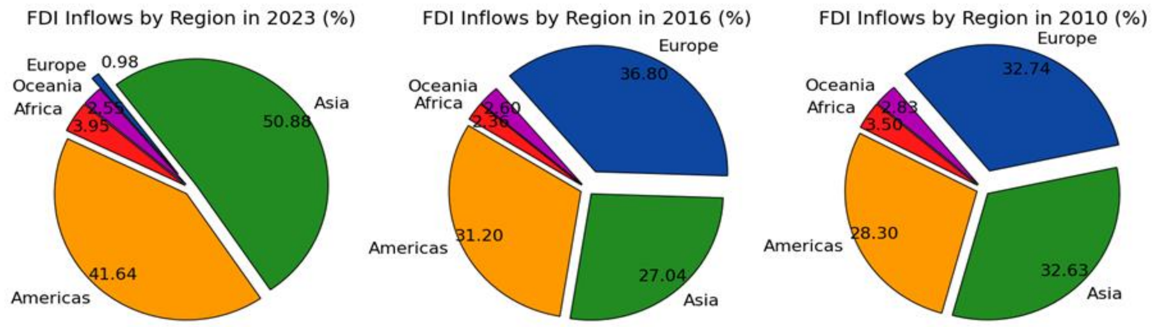
In response to gaps in the literature, this study contributes by integrating both traditional and emerging determinants of FDI into a unified analytical framework. It advances existing research by (i) developing novel indicators, the Bilateral Trade Interdependence Index and the Export-Platform Indicator, to capture functional economic integration and export-oriented investment strategies; (ii) distinguishing between BRI participation and Chinese strategic investment; (iii) empirically examining how these factors have reshaped the geography of FDI across 42 European host and 40 global origin countries from 2010 to 2023; and (iv) addressing potential endogeneity through a rank-based instrument while reclassifying European countries according to their functional roles, identifying emerging investment hubs beyond EU membership.

2.3 Descriptive Statistics and Methodology

2.3.1 Regional and Global FDI Statistics Overview

Europe's FDI inflows shifted from large negative levels in 2021–2022 to slightly positive in 2023, largely influenced by conduit economies such as Ireland, Luxembourg, the Netherlands, Switzerland, and the United Kingdom, through which a significant portion of FDI passes without remaining in the country. Since the negative flows in these countries were smaller in 2023, this created a net positive effect on overall European FDI, while excluding these economies, inflows to the rest of Europe declined by 14 percent (UNCTAD, 2024). Moreover, although European countries historically accounted for 35 percent of global FDI, their inflows have declined dramatically over the past three years (Figure 2.1).

Figure 2.1: Foreign Direct Investment by Region (2010–2023), % of Global Total



Source: Own elaboration based on UNCTAD dataset.
Note: Europe's FDI share is compared to the Americas, including North and Latin America (UNCTAD, 2024).

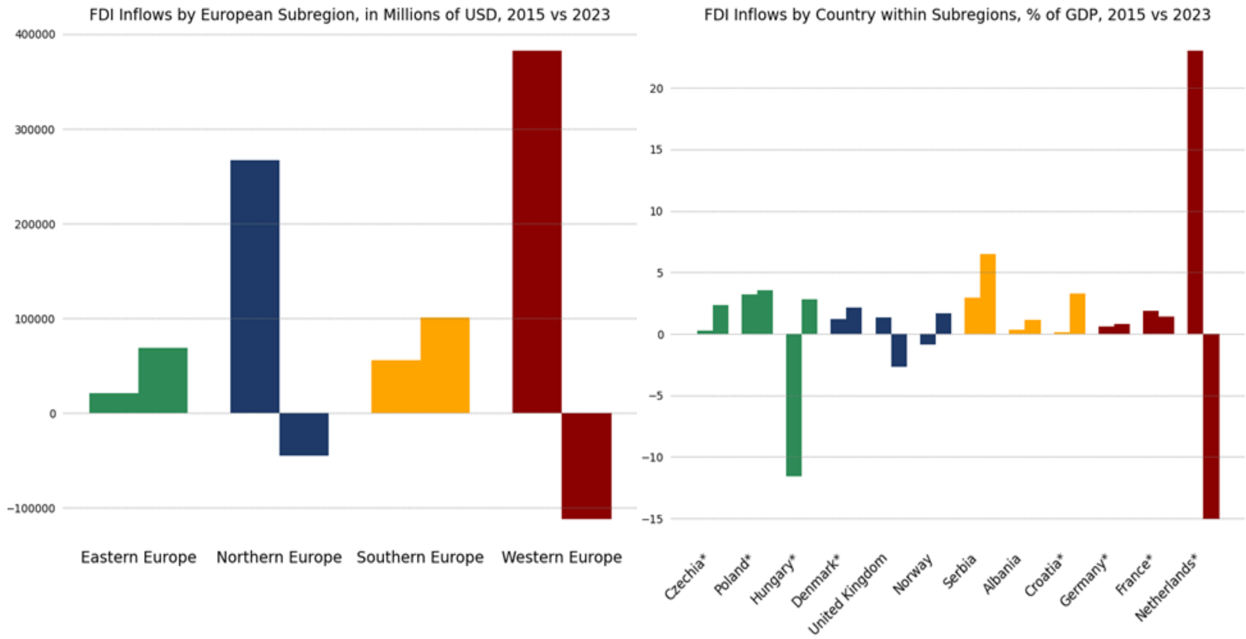
As seen from Figure 2.1, over the period from 2010 to 2023, Europe has seen a marked decline in its share of global FDI inflows. In 2010, Europe was one of the top recipients, attracting 32.7% of total FDI, similar to America. In 2010, Asia and Europe had almost equal FDI inflows, with 32.6% for Asia and 32.7% for Europe, indicating balanced interest in both regions. By 2016, Europe held a more prominent position with 36.8%, surpassing America and Asia. However, in 2023, Europe's overall FDI inflow dropped dramatically to just 0.98%, the lowest among all regions (UNCTAD, 2024). This decline illustrates that the historical advantages of being in Europe (or the EU core) are no longer sufficient to attract FDI, highlighting the relevance of new FDI determinants.

Despite this regional decline, specific areas within Europe experienced notable growth. In Eastern Europe (Figure 2.2), FDI inflows more than doubled, highlighting the region's rising attractiveness to investors. In contrast, Western Europe saw a significant decline in FDI inflows from 2015 to 2023, signaling a shift from traditional EU investment hubs toward Eastern and Southern Europe, which are emerging as new centers of FDI activity. For a more detailed analysis we disaggregate the four European subregions (Eastern, Northern, Southern, and Western Europe) and select three representative countries in each group based on economic significance (Figure 2.2).

Figure 2.2 illustrates that FDI as a percentage of GDP rose markedly between 2015 and 2023 in Hungary, Serbia, Croatia, and Albania, with Serbia reaching the highest share in the region, exceeding 5% of GDP, whereas it declined in the UK and France.

Geopolitical tensions are driving a strategic push to establish reliable local supply capacities. Countries and economic blocs, including the EU, USA, and China, are scrambling to "de-risk" their economies by reducing dependence on foreign suppliers for critical goods such as semiconductors, rare earths, and EV batteries. This shift is fueling a reorientation of FDI, particularly toward the localization of EV and semiconductor supply chains within Europe.

Figure 2.2: European FDI by Subregions in 2015 and 2023



Source: Own elaboration based on UNCTAD dataset.

Although investors from EU core countries remain the primary source of FDI inflows into Europe, their share has been gradually declining. Notably, 2019 marked the first year in which European investors accounted for less than 70% of total FDI inflows in the region. In contrast, Asian investors, particularly from China, have recently increased their share of FDI in Europe, although they still account for a smaller portion compared to European investors. While Chinese FDI in Europe initially increased under the Belt and Road Initiative (BRI) after 2013 and reached its peak in 2016, it is now primarily directed toward strategic sectors such as electric vehicles (EVs), batteries, advanced manufacturing, and export-platform investments, rather than infrastructure projects.

Launched in 2013, the BRI remains a global framework aimed at enhancing regional connectivity, trade, and investment across Asia, Europe, and Africa. By 2023, over 150 countries had signed Memorandums of Understanding (MOUs) under the BRI, with cumulative BRI-related investments exceeding USD 1 trillion (Nedopil Wang, 2025). The initiative includes most low- and middle-income countries worldwide, as well as several developed economies in Eastern Europe. Among Western European nations, Italy was the only country to join the BRI, signing in 2019, although it formally withdrew in 2023.

Moving forward, Asian supply chains are increasingly localizing in Eastern Europe, the Balkans, and Turkey, as investors seek competitiveness amid shifting trade flows.
These countries offer cost advantages and, in some cases, preferential access to the EU Single Market through customs unions or candidate status. Firms such as BYD and CATL may establish production facilities to serve domestic markets and access the wider EU market tariff-free, suggesting that certain European regions could become strategic production hubs for Asian multinationals. Consequently, while EU membership has often served as the primary grouping factor in FDI studies, such classifications may fail to capture emerging production centers, underscoring the importance of including both EU members and neighboring states with EU market access.

2.3.2 Bilateral Trade Interdependence and Export-Platform Indicators

The relationship between international trade and FDI is complex and interconnected. Trade can both substitute for and complement FDI. Market-seeking firms may substitute exports by establishing local subsidiaries, while growing trade in strategic sectors increasingly encourages firms to establish production facilities in Europe to serve both host and third-country markets. This export-platform dynamic reflects deeper functional integration, where trade ties become a key driver of investment decisions.
Trade interdependence can also stimulate FDI by reducing information and transaction barriers while strengthening business networks. Countries with rising trade connectivity are more likely to attract inward FDI, as greater integration into global supply chains enhances their investment appeal.
To empirically capture the degree of trade integration between two countries, this study introduces the Trade Interdependence Index (*Trade_I*). The Trade Interdependence Index measures the importance of bilateral trade between host country *i* and origin country *j* relative to the total trade of the host country with the world in a given year (*t)*. The index is calculated using the following formula (2.1):

$$Trade\ Interdependence\ \left(Trade\_I_{ij,t}\right) = \frac{(Imports_{ij,t} + Export_{ij,t})}{Total\ Trade\ of\ i\ with\ the\ world_t} \times 100 \quad (2.1)$$

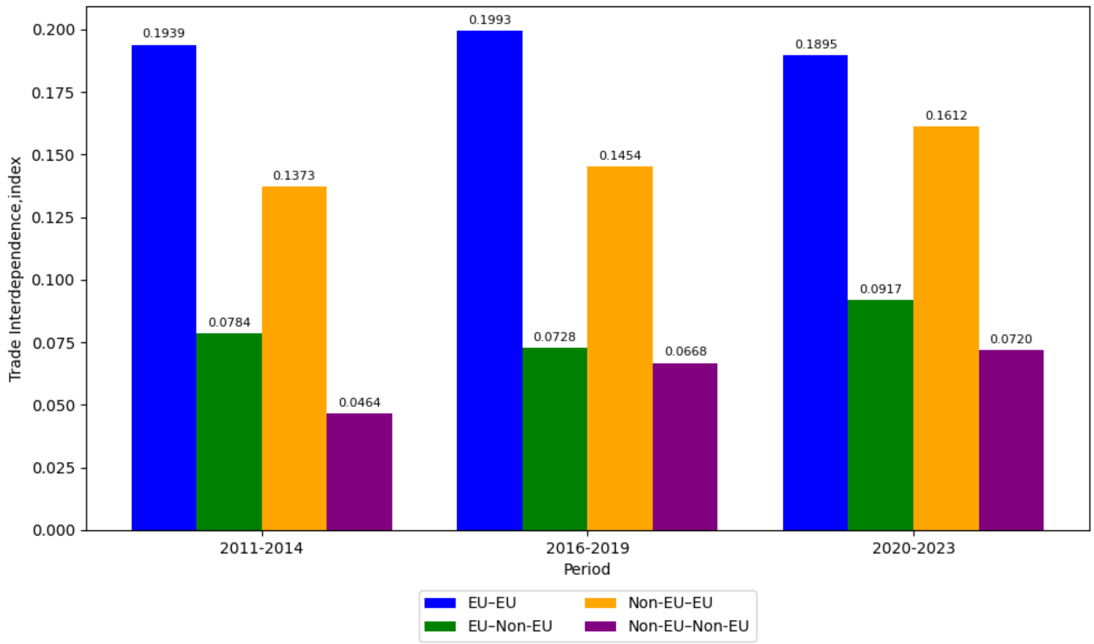
Where:

- $Imports_{ij}$= Imports of host country *i* from origin country *j*
- $Export_{ij}$ = Exports of host country *i* to origin country *j*
- $Total\ Trade_{it}$ refers to the total trade of host country *i* in a specific year *t*. It is calculated as the sum of all imports and exports of country *i* with its trade partners during that year, i.e. $Total\ Trade_{it} = \sum_k (Imports_{ik,t} + Exports_{ik,t})$, where *k* runs over all trade partners).

We keep the index in percent rather than logs, since log transformation would create negative values and complicate interpretation, while percentages allow direct and comparable interpretation across countries and years.

A higher *Trade_I* value indicates a greater trade dependence on the partner country *j*, potentially implying a closer economic relationship that may encourage FDI flows. Using total trade with the world as the denominator ensures that the index consistently reflects the relative importance of partner *j*. In contrast, using only the sum over FDI origin countries could produce values that depend on the subset of countries included in the sample, and the denominator could fluctuate depending on which origins have FDI data in a given year, making comparisons over time unreliable. By using total trade, the index always represents the share of total trade coming from *j*, regardless of how many FDI origins are in the dataset, allowing for consistent comparison both across countries and across years. Figure 2.3 shows trade interdependence trends across country pair types over three periods.

Figure 2.3: Trade Interdependence Index by Period and Country Pair Type



Source: prepared by the author using data from the United Nations Commodity Trade Statistics Database.

As seen from Figure 2.3, *Non-EU–Non-EU* pairs exhibit the fastest growth rate in trade interdependence, increasing by approximately 55% from 0.0464 in 2011–2014 to 0.0720 in 2020–2023. This rapid expansion highlights the growing economic integration and increasing trade flows among non-EU countries, including emerging hubs such as Turkey, Serbia, and other Balkan states, as well as rising Asian origins. Similarly, *EU–Non-EU* pairs — where Non-EU countries such as China, Korea, and the US are origins trading with EU hosts — show a notable rise in trade interdependence (from 0.0784 to 0.0917, +17%). This suggests that EU countries are becoming increasingly important destinations for Non-EU exporters, possibly reflecting growing production integration, supply chain links, and investment flows from Asia and the US into the EU. *Non-EU–EU* pairs follow a similar trajectory (+17.4%). This growth highlights how EU exporters and investors are deepening their integration with nearby *Non-EU* economies, reinforcing Europe's broader regional interconnectedness.

In contrast, *EU–EU* pairs experience a slight decline of about 2.3%, indicating that trade interdependence among EU member states may be stabilizing. Overall, these patterns suggest that the fastest-growing trade interdependence is occurring outside the traditional core of EU-to-EU trade relationships, driven particularly by non-EU countries both within Europe and beyond. This has important implications for understanding the evolving architecture of European trade and FDI, emphasizing the increasing significance of emerging hubs and external partners in shaping regional integration.

To gain a deeper understanding of these evolving trade relationships, we adopted a rank-based analytical approach to assess the relative intensity of trade interdependence between country pairs. Specifically, we calculated rankings (1 to 5) of trade interdependence for each country pair, categorized into the same four regional pair types used in earlier analysis: EU–EU, EU–Non–EU, Non–EU–EU, and Non–EU–Non–EU. This analysis spans three distinct periods (P): 2011–2014 (P1), 2016–2019 (P2), and 2020–2023 (P3), enabling us to identify the most dominant trade links within and beyond Europe, while revealing how patterns of regional integration have evolved. Given the volume and complexity of the data (60 rankings in total), detailed results are presented in Appendix A (Figure A1), with key findings summarized in Table 2.2.

Table 2.2: Summary Matrix of Trade Interdependence Trends and Key Country Pairs

Group	EU	Non-EU
EU	Shift from EU core to new EU members, reflecting stronger integration of Central and Eastern Europe. *Examples:* • Luxembourg-Belgium (0.203, P.1), • Austria–Germany (0.325, P.2), • Poland–Germany (0.239, P.3)	China and the USA (US) remain top partners across all periods, reflecting extra-EU linkages. *Examples:* • Ireland–US (0.180, P.1), • France–China (0.072, P.2), • Hungary–China (0.045, P.3)
Non–EU	Candidate and neighboring countries increasingly act as production and supply chain hubs within the EU *Examples:* • Bosnia and Herzegovina – Croatia (0.146, P.1), • Turkey– Germany (0.095, P.2), • North Macedonia–Germany (0.234, P.3)	Fastest-growing trade interdependence; regional and Asian linkages intensify, highlighting Asia's influence. *Examples:* • Bosnia and Herzegovina –Serbia (0.093, P.1), • Montenegro–China (0.087, P.2), • Turkey–China (0.074, P.3)

Source: Author's own analysis

Note: Andorra and Albania show high trade interdependence with Spain and Italy, respectively, but each is dependent on this single partner, making them exceptions.

As shown in Table 2.2 and Figure A1 (Appendix A), EU–EU pairs dominated trade interdependence rankings, reflecting strong intra-EU integration. Within the EU, trade links have shifted from traditional core countries toward new member states, reflecting stronger integration of Central and Eastern Europe. Traditional links such as Luxembourg–Belgium and Austria–Germany were prominent in earlier periods, while Czechia–Germany, Poland–Germany, and North Macedonia–Germany have emerged as key trade connections in later periods, highlighting the increasing role of new EU members in European supply chains. Importantly, their growing role is not limited to intra-EU trade; these countries also feature prominently in EU–Non–EU trade relationships, particularly with major global partners such as China and the USA.

Indeed, outside the EU, China and the USA remain consistently important partners for EU countries, with trade links such as Ireland–US, France–China, and Hungary–China maintaining high interdependence across all periods. Non-EU countries interacting with EU members, including Bosnia and Herzegovina–Croatia and Turkey–Germany, are increasingly integrated into EU supply chains, reflecting their role as emerging nodes in regional production networks.

While EU countries generally maintain higher overall indices, trade interdependence among Non-EU countries is growing fastest, driven by regional and Asian linkages, with examples such as Montenegro–China and Turkey–China, underscoring Asia's rising influence in the broader European trade landscape.

When ranked by aggregate trade interdependence, EU-origin countries dominate—particularly in EU–EU and EU–Non–EU groups—while Asian-origin countries have long remained overshadowed but are now emerging more prominently in Europe. In over half of the European host countries, Asian origins rank among the top 10 trade partners, engaging not only with integrated Europe Core countries (Germany, France, Netherlands, Norway), but also with new EU members (Poland, Hungary, Romania), candidate countries (Turkey, Serbia), and neighboring non-EU states (Ukraine, Moldova). Notably, China, Japan, Indonesia, Singapore, Taiwan, South Korea, and Viet Nam have steadily increased their trade interdependence with Europe year by year.

Trade interdependence primarily reflects direct economic ties between two countries (e.g., origin *j* and host *i*)—such as through total trade flows or demand potential—and may explain trade and FDI motivated by access to the host market. However, in many cases, market access alone is no longer a sufficient motive for investment or trade. Instead, firms may target strategic locations for their potential as production hubs, leveraging supply chain efficiencies and regional trade agreements. In such cases, FDI and trade flows are often driven by broader regional or global strategies, where the host country serves primarily as a platform to export to third countries rather than as the final destination. This is particularly relevant for Asian-origin countries which, as our analysis suggests, invest in and trade with European host countries not only for local market access but also to re-export to third-country markets across Europe.

As a result, trade interdependence may not fully capture these indirect motives and can underestimate a country's strategic value as an export platform.

To address this, we introduce the Export-Platform Indicator (Z_{ijt}, Formula 2.2), a third-country instrument designed to capture the host country's *(i)* capacity to serve as a re-export base. Specifically, the Export-Platform Indicator is constructed as the value of exports from host country *i* to all third countries *k,* except the origin country *j* (i.e., *k ≠ j).* Z_{ijt} is calculated for each host–origin–year (*i*–*j*–*t*) combination and captures the extent to which *i'*s exports to third countries reflect its potential to serve as an export platform for investors from *j*, with trade flows weighted by distance.

The indicator is formally defined as:

$$Z_{ijt} = \sum_{k \neq j} \frac{Exports_{ikt}}{Distance_{ik}^{\delta}} \qquad (2.2)$$

Where:

- Z_{ijt} is the export-platform indicator of host *i* with respect to origin country *j* in year *t.*
- $\sum_{k \neq j} Exports_{ik}$ is the value of exports from host *i* to third country *k;* the origin country *j* is excluded to avoid directly capturing bilateral trade between *i* and *j*.
- $Distance_{ik}$ is the geographic distance between *i* and *k.*
- t refers to the year (2010 to 2023).
- δ is the *distance* decay parameter (typically between 0.7 and 2) that captures how distance reduces trade. We set δ=1, so the index emphasizes countries that export strongly to nearby third markets, consistent with the concept of regional export platforms. Choosing δ=2 would overweight nearby partners, even if distant partners account for substantial trade.

High Z_{ijt} values suggest that FDI may be motivated by re-export opportunities (export-platform FDI), the sourcing of intermediate goods, or a mix of these factors together with market-access motives. While vertical FDI is typically identified through trade in intermediate goods (which our aggregate trade data do not allow us to isolate), our results primarily speak to the export-platform dimension of FDI. In our empirical analysis, a positive coefficient on Z_{ijt} suggests that greater export-platform capacity of host *i* (toward third countries) is associated with increased FDI from origin *j*.

Export-platform FDI in Europe is primarily directed toward accessing nearby markets, particularly within the EU. Nevertheless, there are important cases where affiliates located in Europe also serve more distant destinations. For instance, automotive production in Central and Eastern Europe and pharmaceutical manufacturing in Ireland are partly exported outside Europe, including to North America, Asia, and the Middle East. For this reason, our indicator is constructed to include all third-country destinations, while the distance-weighting ensures that nearby markets dominate its value. This approach allows us to remain consistent with the regional focus of most export-platform strategies, while also accommodating the global dimension.

While Z_{ijt} is an aggregate, country-level proxy rather than a firm-level measure, our contribution is to focus specifically on exports to third countries, excluding the origin country, and to apply distance weighting, which captures the host country's potential to serve as a hub for multiple markets.

We use the logarithm of Z_{ijt} to improve the symmetry of its distribution and reduce the influence of extreme values. While Santos Silva & Tenreyro (2006) discuss the benefits of log-transforming trade flows in gravity-type models, we apply the same reasoning to our export-platform indicator Z_{ijt}, which is constructed from aggregate trade flows to third countries. Appendix A, Figure A2 presents two histograms comparing the distribution of Z_{ijt} and *lnZ*. The histograms show that the log-transformed export-platform indicator *(lnZ)* is less skewed, more symmetric, and less dominated by extreme values than the original Z_{ijt}, supporting the use of the logarithm in the analysis.

2.4 Empirical Analysis and Stages of the Study

2.4.1 Data and Empirical Strategy

Our dataset comprises yearly observations from 42 European host countries and 40 global origin countries over the period 2010–2023. In addition to all 27 EU member states, we include the United Kingdom (UK), EU candidate countries—Albania, Bosnia and Herzegovina, Moldova, Montenegro, North Macedonia, Serbia, Turkey, and Ukraine—as well as the potential EU candidate Kosovo. To better capture functional economic integration, we also include non-EU European economies with strong ties to the Eurozone, such as Norway, Switzerland, and Iceland, along with Andorra and Belarus due to their distinct non-Eurozone status. This approach allows us to analyze trade–FDI patterns beyond formal EU membership.

FDI flow data are drawn from the UNCTAD database (2025) and supplemented by the CEPII Gravity Database (Conte, Cotterlaz, & Mayer, 2022). GDP figures are obtained from the World Bank World Development Indicators (World Bank, 2025), while trade data are sourced from UN Comtrade (UN Comtrade, 2025). Due to the absence of consistent annual observations for Kosovo and Belarus, we utilize data sourced from local agencies.

In the dataset, some observations of bilateral FDI flows between major European financial hubs (e.g., Luxembourg, Ireland, and Netherlands) and their partners showed abnormally large negative values. These extreme cases likely reflect intra-firm financial restructuring, balance sheet consolidations, or transactions through special purpose entities, which are common in tax-optimized jurisdictions. Since these flows are orders of magnitude larger than typical bilateral FDI and reflect accounting practices rather than productive investment, they were excluded from the dataset. This interpretation is consistent with IMF, OECD, and UNCTAD practices. It is a tiny fraction of the sample (<1%), and the affected countries remain in the dataset with their regular investment flows, ensuring that their role as key FDI hubs is preserved while avoiding distortions from statistical anomalies.

Additionally, in our dataset, approximately 27% of observations are negative or zero. Negative FDI flows reflect real economic phenomena such as disinvestment through equity capital, reinvested earnings, or intra-company loans, and thus cannot be ignored entirely. However, for the main analysis we employ the Poisson Pseudo-Maximum Likelihood (PPML) estimator, which requires non-negative dependent variables. Following established practice (Bruno et al., 2017; Kox and Rojas-Romagosa, 2019), we set negative FDI flows to zero while keeping genuine zero flows unchanged. To address potential concerns about truncation, we also conduct robustness checks using Ordinary Least Squares (OLS) estimator with FDI in levels, which naturally accommodates both negative and zero flows.

Table A1 in Appendix A reports descriptive statistics for the main variables used in the analysis, including bilateral FDI flows, trade interdependence, gravity controls, and EU dummies. Appendix Table A2 presents the corresponding Pearson correlation matrix. The results show no evidence of problematic multicollinearity. Together, these tables provide an overview of the data distribution and the associations among key variables.

The empirical analysis is grounded in an extended gravity model of FDI, which incorporates both standard economic determinants and two novel indicators: the Trade Interdependence Index ($Trade\_I$) and the Export-Platform Indicator (Z_{ijt}):

- The Trade Interdependence Index ($Trade\_I$) captures the strength of bilateral trade relationships and serves as a proxy for market-access FDI. It reflects how economically connected a host country is to a specific origin country.
- The Export-Platform Indicator (Z_{ijt}) developed specifically for this study, measures the degree to which a host country is used as a base for re-exporting to third markets. It captures strategic FDI patterns beyond direct market access.

By combining these indicators, the analysis distinguishes between different FDI motivations and identifies structural patterns that go beyond traditional EU membership or geographic proximity.

While the trade interdependence captures the relative importance of trade with host *i*, it may still be endogenous in the FDI regression if unobserved factors simultaneously affect trade and FDI. To address this potential endogeneity, we construct a rank-based instrument. Instead of using the level of exports or the Export-Platform Indicator (Z_{ijt}) , the instrument based on the relative rank of the host's Z_{ijt}, (Formula 2.2). For each host in a given year, (Z_{ijt}) values across partners are ranked in descending order, and the normalized rank is as shown in Formula (2.3).

$$Z\_rank\_norm_{ijt} = \frac{N_{it} - rank\ (Z_{ijt})}{N_{it} - 1} \tag{2.3}$$

Where N_{it} denotes the number of partner countries associated with host *i* in year *t.* This approach captures the relative importance of each partner for that host, while excluding the specific origin (*j*), providing a valid instrument for the FDI regression. The normalized rank equals 0 for the partner with the highest (Z_{ijt}) and 1 for the partner with the lowest.

We implement a two-stage estimation using high-dimensional fixed effects (HDFE) regressions and PPML. In the first stage, trade interdependence (*Trade_I*) is regressed on the rank-based instrument ($Z\_rank\_norm_{ijt}$) and controls, absorbing host-year and origin-year fixed effects to account for unobserved heterogeneity. Fitted values and residuals are used to test instrument relevance. In the second stage, PPML estimates FDI using the exogenous component of trade interdependence.

Although we test for endogeneity of *Trade_I* in all models, we present the instrumental variable results for one representative specification in the Appendix A (Tables A3–A4) to illustrate that endogeneity does not affect our main findings.

The residual from the first-stage regression (*cf_resid*) was not statistically significant in the second stage (Table A4), suggesting that endogeneity is likely limited. The coefficient on trade interdependence (*Trade_I*) remains positive and significant, indicating that our results are robust to potential endogeneity.

A negative coefficient for $Z\_rank\_norm_{ijt}$ makes sense because higher ranks correspond to lower normalized rank values (i.e., more trade with that partner results in a lower $Z\_rank\_norm_{ijt}$), leading to higher *Trade_I*. Having established that our instrument adequately captures the exogenous variation, we then proceed to use *Trade_I* as the main explanatory variable.

The empirical strategy is implemented in two main stages:

- Stage 1: Assessing the effects of trade interdependence, EU membership, and BRI participation on FDI flows.
- Stage 2: Incorporating the export-platform dimension and heterogeneity in FDI drivers, including Chinese investment.

2.4.2 Trade Interdependence, EU Membership, and BRI Effects on FDI

The first stage of the analysis involves estimating an augmented gravity model that, in addition to economic size and distance, incorporates additional factors such as trade interdependence, EU membership and BRI participation as explanatory variables for bilateral FDI flows (Equation 2.4).

$$FDI_{ijt} = exp\Big[\beta_0 + \beta_1 \ln(GDP_{it}) + \beta_2 \ln\big(GDP_{jt}\big) - \beta_3 \ln\big(dist_{ij}\big) + \beta_4 EU\_host_{it} + \beta_5 EU\_origin_{jt} + \beta_6 Trade\_I_{ijt} + \beta_7 comlang_{off_{ij}} + \beta_8 comrelig_{ij} + \beta_9 BRI\_host_{it}\Big] \times \epsilon_{ijt} \tag{2.4}$$

Where:

- FDI_{ijt} represents bilateral FDI flows from origin *j* to host country *i* in year *t*,
- GDP_{it} and GDP_{jt} denote the time-varying real GDP of host country *i* and origin country *j*, respectively, in year *t,*
- $dist_{ij}$ is the geographical distance between countries *i* and *j,*
- EU_host_{it} and EU_origin_{jt} are dummies indicating EU membership of host and origin countries in year *t*,
- $Trade\_I_{ijt}$ captures bilateral trade interdependence between *i* and *j* in year *t*,
- $comlang\_off_{ij}$ is a dummy for shared official language,
- $comrelig_{ij}$ is a dummy for common religion,
- BRI_host_{it} dummy indicating BRI membership of host countries in year *t*,
- ϵ_{ijt} is the error term.

Additional bilateral and interaction variables used in subsequent models are presented in Appendix A (Table A5).

Based on our data and following recent recommendations (Larch, Shikher, & Yotov, 2025; Herman, 2023), the model incorporates host-time ($\alpha_{i,t}$) and origin-time($\delta_{j,t}$) fixed effects, which absorb all time-varying country characteristics (such as GDP). Country-pair fixed effects (γ_{ij}) which capture time-invariant bilateral characteristics (such as distance, common language, or religion), were also tested but not included in the final specification. Consequently, these characteristics are included explicitly as variables in the estimation rather than being absorbed by fixed effects.

All estimations are performed using Stata. For the main analysis, we employ the PPML estimator, while OLS estimates are used as robustness checks. The PPML is specifically designed to handle the resulting highly right-skewed distribution of FDI. For robustness, standard errors are clustered by dyadic country pairs to account for serial correlation.

At this stage, we test whether stronger trade ties are associated with higher FDI inflows and whether FDI is driven more by market access or by participation in regional frameworks that enhance connectivity and production integration. We also compare the effects of functional integration, formal EU membership, and BRI participation. Results are shown in Table 2.3.

Table 2.3: Gravity Model Estimation Results

Model[1] Dependent variable	(1)[2] FDI	(2) FDI	(3) FDI	(4) FDI	(5)[3] FDI
Trade_I	74.1127* (39.9614)	0.0506*** (0.0093)	-0.0504* (0.0285)	0.0798*** (0.0124)	0.0479*** (0.0101)
ln_dist	-667.7508*** (128.0091)	-0.2685** (0.1097)	-0.3589*** (0.1008)	-0.2698*** (0.1001)	-0.2705*** (0.1012)
ln_GDP_{it}	306.0710*** (43.2824)	0.5420** (0.2615)			
ln_GDP_{jt}	343.4810*** (71.6665)	0.0661 (0.3440)			
EU_host	144.6234 (124.4407)	0.1418 (0.1807)			
EU_origin	-428.7108*** (158.0309)	-0.5939** (0.2697)			
BRI_host	-700.6104*** (98.1758)	-0.3386*** (0.1251)			
EU_pair			0.3492** (0.1656)	0.4090** (0.1921)	0.4991** (0.2131)
BRI_pair			0.4915 (0.3722)	1.1810** (0.5701)	0.4493 (0.3546)
Trade_I × ln_GDP_{it} × ln_dist			0.0013*** (0.0003)		
comlang_off			-0.2083* (0.1207)	-0.1740 (0.1265)	-0.1746 (0.1314)
comrelig			0.8270*** (0.1737)	0.8402*** (0.1806)	0.8530*** (0.1828)
BRI_pair × Trade_I				-0.1236 (0.1006)	
EU_pair × Trade_I				-0.0311** (0.0139)	
EU–Non-EU × Trade_I					0.0376** (0.0178)
Non-EU–EU × Trade_I					0.0161 (0.0164)
Non-EU–Non-EU × Trade_I					0.0012 (0.0356)
_cons	-2066.2536** (868.0295)	2.2086 (6.5732)	10.2942*** (0.7446)	9.6634*** (0.7502)	9.6097*** (0.7543)
N	14615	14615	14387	14387	14387
r2_p		0.7491	0.8293	0.8275	0.8276

Source: Author's elaboration.

Note: [1]Model (1) in Table 2.3 estimates the baseline gravity specification using OLS with high-dimensional fixed effects (*reghdfe*), while Models (2)–(5) employ the PPML estimator (*ppmlhdfe*) to account for the multiplicative nature of the gravity framework and the presence of zero FDI flows. Models (2)–(5) include origin–time and host–time fixed effects to control for country-specific time trends; however, pair fixed effects are not included, since only Croatia changed its EU membership status during 2010–2023, and their inclusion could lead to overfitting due to limited within-pair variation. Standard errors in parentheses + p < 0.10, * p < .05, ** p < .01.

[2] Large coefficient estimates and standard errors in Model (1) arise because the OLS regression is estimated with FDI in levels, which yields higher than log-linear or PPML; the significance of the coefficients remain robust.

[3] Interaction terms (EU–Non-EU × Trade_I, Non-EU–EU × Trade_I, Non-EU–Non-EU × Trade_I) capture differences in the effect of trade interdependence by country-pair EU status, as defined in Section 2.3.2.

The coefficients of *Trade_I* are consistent across all estimators in Table 2.3, confirming the main hypothesis that stronger bilateral trade interdependence is positively associated with higher FDI inflows. Namely, a one–percentage-point increase in trade interdependence is associated with an approximately 0.05-unit (5%) higher expected FDI inflow (Models 2–5), all else being equal. The absolute effect in million USD varies depending on the baseline FDI level, so small investors experience only modest changes while larger flows may change more substantially. The pattern suggests that firms invest in countries with existing trade links, reflecting both market-seeking motives and export-platform strategies, where affiliates may serve multiple markets. The results provide quantitative evidence that FDI and trade are complementary.

Moreover, as seen from Model 3, the effect of trade interdependence on FDI depends simultaneously on the host country's GDP and geographic distance (*Trade_I × ln_GDP*$_{it}$ *× ln_dist*). In practical terms, this implies that European economies with substantial trade links can attract relatively higher FDI inflows from distant foreign investors, such as China, highlighting the role of trade integration in FDI patterns. In this context, investors may prioritize economic scale over linguistic proximity *(comlang_off)* when making cross-border investment decisions.

The coefficients of the gravity variables are consistent with theoretical expectations. The negative and significant effect of distance *(ln_dist)* indicates that geographical proximity facilitates FDI flows, while the positive coefficients on host and origin GDPs suggest that larger and more developed economies both attract higher levels of FDI. Shared religion (*comrelig)* exhibits a positive and significant association with FDI, suggesting that cultural proximity fosters cross-border investment.

EU integration plays a substantial role in shaping FDI patterns. Although EU membership of the host country (*EU_host*) is not significant and EU membership of origin *(EU_origin)* has a negative effect (Models 1–2), bilateral EU membership (*EU_pair*) significantly enhances FDI flows, with EU pairs receiving approximately 49.1% more FDI than non-EU pairs. This finding is consistent with prior research: Bruno (2020) estimates that bilateral EU membership boosts FDI by about 50%, while Grieveson et al. (2021) report a 35% increase—highlighting the strong role of EU integration.

The coefficient on the interaction term *EU_pair× Trade_I* is --0.0311 (Model 4), indicating that the positive effect of trade interdependence on FDI inflows is weakened for EU pairs. In other words, while trade generally promotes FDI, this effect is smaller when both countries are EU members, suggesting that EU integration may partially substitute for the role of trade in attracting FDI. At the same time, trade interdependence matters most when at least one country is in the EU, especially for *EU–Non-EU* pairs (0.0376, $p<0.05$), whereas *Non-EU–EU* and *Non-EU–Non-EU* pairs exhibit only a weak or insignificant trade effect (Model 5).

Although the coefficient of the BRI participation variable *(BRI_pair)* is positive, it is statistically insignificant in Models 3 and 5. This may reflect that BRI projects in Europe are primarily loan-financed infrastructure initiatives rather than direct FDI inflows, that European markets are already integrated and capital-abundant, or that a time lag delays observable effects. Geopolitical and regulatory concerns, particularly within the EU, may also dampen investment responses. In addition, heterogeneity across European countries could mask the BRI's impact rather than indicating a uniformly null effect. Consistently, being a BRI host country *(BRI_host)* is associated with a significant reduction in FDI (Models 1–2), suggesting that these infrastructure projects may substitute for private investment.

When the interaction between BRI participation and trade interdependence (*BRI_pair × Trade_I*) is introduced in Model 4, the coefficient on the *BRI_pair* dummy becomes positive and statistically significant, indicating that the baseline FDI effect of BRI membership is more clearly identified once trade-related channels are accounted for. However, the interaction term (β = −0.1236) is insignificant, indicating that trade intensity does not moderate the BRI's effect on FDI. This pattern may reflect the nature of BRI engagement in Europe, where many projects are infrastructure-oriented or state-driven rather than contingent on existing trade relationships. Notably, countries such as Serbia, Hungary, Montenegro, and Greece serve functional roles as emerging hubs, attracting BRI-related investment even with modest trade linkages. Conversely, core European economies (Germany, France), despite deep trade ties and EU membership, have not participated in the BRI, suggesting that FDI distribution is heterogeneous and shaped by country-specific roles in regional investment networks rather than by EU status.

By analogy, the negative but significant *EU_pair × Trade_I* interaction in Model 3 indicates that some EU countries attract substantial FDI despite limited trade dependence, while others maintain strong trade relations but receive relatively modest FDI inflows. For instance, Ireland receives disproportionately high levels of FDI, largely due to its favorable tax regime rather than bilateral trade dependency. In contrast, the Czech Republic—though deeply embedded in European manufacturing supply chains and maintaining strong trade relations, particularly with Germany—records more uncertain FDI inflows. This likely reflects the fact that deeper economic integration within the EU reduces the extent to which FDI decisions are directly tied to trade, whereas for *EU–Non–EU* pairs, trade matters more, as shown in Model 5.

The general results from Table 2.3 provide statistically robust evidence that the effect of trade interdependence on FDI systematically differs between EU and non-EU pairs. While EU membership facilitates both trade and FDI, it alone is not sufficient to fully explain Europe's investment landscape. The limited and heterogeneous impact of BRI participation further supports this view, suggesting that alternative integration mechanisms beyond the EU—such as the BRI—also influence regional investment dynamics. Indeed, non-EU countries such as Turkey and Serbia attract substantial FDI and maintain active trade relationships despite not being EU members, indicating that factors beyond formal EU membership better account for current FDI patterns.

Additionally, countries that joined the EU after 2004 often experience a temporary surge in FDI during the early years of their membership, with this effect tending to diminish or stabilize as integration matures. Consequently, in non-EU country pairs, trade appears to exhibit a stronger complementarity with FDI—often driven by motives such as gaining market access or establishing export platforms—resulting in a more pronounced trade–FDI relationship outside the EU.

These findings highlight the importance of reclassifying and expanding the analytical sample beyond formal EU membership, particularly by including countries like Turkey, Serbia, and other European countries that have become significant production hubs despite not being full EU members. Many of these countries are also engaged in the BRI framework, further illustrating how non-EU integration channels contribute to shaping FDI patterns in Europe. Their integration into European value chains—driven by geographic proximity, cost competitiveness and FDI-friendly reforms—makes them functionally similar to the new EU member states. Including these countries in the analysis helps identify patterns of functional integration that extend beyond institutional affiliation.

To operationalize this perspective, we reclassify countries based on observed trade and investment linkages and regional economic roles, rather than formal EU membership, providing a more relevant framework that better reflects the functional economic integration shaping FDI in Europe (Table A6 in Appendix A).

Specifically, host countries are categorized into three groups: Integrated Europe Core (e.g., Germany, France, the Netherlands, Norway), Emerging Strategic Hubs (e.g., Hungary, Turkey, Romania, Serbia), and Neutral States (e.g., Albania, Andorra, Belarus). Notably, Norway and Switzerland are included in Group 1 due to their harmonized trade regimes and their role as significant investors in Europe, while the United Kingdom is treated as a main trade partner both during its EU membership up to 2020 and thereafter.

To minimize the influence of extreme trade dependency values, we assign countries with only one dominant trade partner to a separate group (Neutral), such as Albania–Italy, Andorra–Spain, and others (Table A6 in Appendix A). This functional classification also reflects countries' varying exposure to alternative integration frameworks, such as the BRI, which increasingly influence investment linkages beyond the EU core.

Origin countries are grouped into EU origins, Asia, and Other (Table A6 in Appendix A). Grouping origin countries by region captures shared economic characteristics, institutional frameworks, cultural ties, and trade agreements that influence FDI flows. It accounts for proximity effects, reduces omitted variable bias, and aligns with empirical evidence showing that FDI tends to cluster within regions.

Moreover, FDI flows fluctuate over time due to economic cycles, market conditions, and regulatory changes. We introduce a division of FDI into distinct phases, 2010 to 2013 as the early take-off and learning phase, 2014 to 2017 as the surge and peak, and 2018 to 2023 as the downturn, regulatory pushback, and sectoral rebound, to capture phase-specific dynamics in investment flows. To capture potential time-varying effects, we also divide BRI participation into two periods: *BRI_early* (2013–2018), representing the initial expansion phase, and *BRI_late* (2019–2023), reflecting the more recent phase of investment under the BRI framework (Table 2.4).

While country-year fixed effects account for global shocks, the inclusion of FDI periods allows us to examine how investment patterns, including Chinese FDI in Europe, differ across cycles and regions, and to compare structural changes over time. Without these periods, the gravity model assumes a stable relationship over the entire time span, which can mask important shifts in FDI behavior. To validate this classification and the defined periods, we estimate five PPML models to test whether the BRI effects, functional typology, along with the three FDI periods, provides a better explanation of bilateral FDI patterns compared to traditional institutional categories (Table 2.4).

In Table 2.4, while *Trade_I*, *EU_pair,* and *ln_dist* all show the expected significant effects, our primary focus here is on the impact of the BRI (Model 1). *BRI_early* has a large positive and significant coefficient, indicating that countries participating in the BRI during 2013–2018 received substantially higher FDI, highlighting the importance of early BRI engagement. By contrast, *BRI_late* is positive but not significant, suggesting that more recent participation has not yet translated into measurable FDI effects. The interaction *BRI_early × Trade_I* is negative and significant, implying that early BRI projects partially substitute for trade-driven FDI, while the interaction *BRI_late × Trade_I* is insignificant, highlighting the limited impact of recent BRI engagement.

Based on the BRI analysis, more recent Chinese investment appears to foster the emergence of production hubs in Europe. Thus, rather than including the BRI variable directly, future analysis will use our functional classification to distinguish Asia as a source region and China as a specific origin of FDI, highlighting the shift from early infrastructure-focused BRI investment to a new wave of manufacturing- and strategic-sector-oriented investment (Models 3–5).

Table 2.4: Functional Integration, Trade Interdependence, and Time Effects on FDI

Model	(1)	(2)	(3)	(4)	(5)
Dependent variable	FDI	FDI	FDI	FDI	FDI
Trade_I	0.0546***	0.0186	0.0447***	-0.4403**	0.0684***
	(0.0091)	(0.0179)	(0.0137)	(0.1914)	(0.0114)
EU_pair	0.3776**	0.3489**	0.4407***	0.4523***	0.4314**
	(0.1577)	(0.1593)	(0.1680)	(0.1667)	(0.1681)
ln_dist	-0.2603***	-0.2573**	-0.2651**	-0.3013***	-0.2661***
	(0.1010)	(0.1036)	(0.1036)	(0.1043)	(0.1024)
BRI_early	2.3038***				
	(0.7567)				
BRI_late	0.5643				
	(0.6198)				
BRI_early × Trade_I	-0.3563**				
	(0.1568)				
BRI_late × Trade_I	-0.0279				
	(0.0975)				
Europe Core × Period 1 × Trade_I		0.0248			
		(0.0208)			
Europe Core × Period 2 × Trade_I		0.0253			
		(0.0242)			
Europe Core × Period 3 × Trade_I		0.0494**			
		(0.0199)			
Emerging Hubs× Period 1× Trade_I		0.0395**			
		(0.0193)			
Emerging Hubs× Period 2× Trade_I		0.0473**			
		(0.0221)			
Emerging Hubs× Period 3× Trade_I		0.0434**			
		(0.0199)			
Neutral States × Period 1 × Trade_I		0.0255			
		(0.0207)			
Neutral States × Period 2 × Trade_I		0.0604***			
		(0.0143)			
Asia × Period 1× Trade_I			0.1268		
			(0.1026)		
Asia × Period 2× Trade_I			0.1173		
			(0.0816)		
Asia × Period 3× Trade_I			-0.0653		
			(0.0698)		
Europe × Period 1× Trade_I			-0.0046		
			(0.0178)		
Europe × Period 2× Trade_I			-0.0255		
			(0.0237)		
Europe × Period 3× Trade_I			0.0370*		
			(0.0190)		
Other × Period 1× Trade_I			0.0102		
			(0.0262)		
Other × Period 2× Trade_I			0.0945***		
			(0.0235)		
Europe Core × Asia × Trade_I				0.4981**	
				(0.2005)	
Europe Core × Europe × Trade_I				0.4848**	
				(0.1919)	
Europe Core ×Other × Trade_I				0.5019***	
				(0.1881)	
Emerging Hubs × Asia × Trade_I				0.5288***	

Table 2.4 (continued)					
Model	(1)	(2)	(3)	(4)	(5)
				(0.2005)	
Emerging Hubs ×Europe × Trade_I				0.4926***	
				(0.1912)	
Emerging Hubs ×Other × Trade_I				0.2914	
				(0.1882)	
Neutral States × Asia × Trade_I				0.6527***	
				(0.2172)	
Neutral States ×Europe × Trade_I				0.4878***	
				(0.1882)	
NonHubs × Pre3× Trade_Asia					0.8315***
					(0.2210)
NonHubs× Period 3× Trade_Asia					0.3843
					(0.2777)
Em.Hubs × Pre3× Trade_Asia					0.6135***
					(0.2034)
Em.Hubs × Period 3 × Trade_Asia					0.1767
					(0.3511)
NonEur.Core × Pre3 × Trade_EU					-3.5985*
					(2.0058)
NonEur.Core× Period 3 × Trade_EU					0.5623
					(1.9431)
Europe Core × Pre3 × Trade_EU					-4.2160**
					(1.8562)
Europe Core × Period 3 × Trade_EU					1.6420
					(1.9992)
_cons	9.8888***	9.8839***	9.8719***	10.1717***	9.8726***
	(0.7476)	(0.7619)	(0.7607)	(0.7658)	(0.7560)
N	14387	14387	14387	14387	14387
r2_p	0.8238	0.8243	0.8266	0.8253	0.8255

Source: Author's elaboration.

Note: Standard errors in parentheses + p < 0.10, * p < .05, ** p < .01. Period numbers (1, 2, and 3) refer to the FDI periods described below: Period 1 = 2010–2013 (early take-off); Period 2 = 2014–2017 (surge and peak); Period 3 = 2018–2023 (downturn/rebound). "Pre3" it's shorthand for "pre-Period 3." "NonHubs" means non-emerging hubs, "Em.Hubs" means emerging hubs, and "NonEur.Core" - non-Europe Core hosts. Trade_Asia = Trade_I × Asia (origin). Trade_EU = Trade_I * EU (origin).

In Model 2, regional and phase-specific dynamics are explicitly accounted for, consistent with our hypotheses and earlier findings. These results support distinguishing FDI into three periods to better capture temporal variation across investment phases. Aggregating all years would obscure important patterns, particularly the rising role of trade in *Emerging Hubs* and *Europe Core*. Trade interdependence increasingly drives FDI in *Emerging Hubs* across all periods (Period 1: 0.0395; Period 2: 0.0473**; Period 3: 0.0434**), while *Europe Core* shows a growing effect in the most recent period (Period 3: 0.0494**). *Neutral States* exhibit a marked increase in trade-driven FDI in Period 2 (0.0604***), highlighting the heterogeneity of trade's impact across country types.

Model 3 highlights the origin-specific effects of trade interdependence on FDI. For *Asia*, the coefficients are positive in Periods 1 and 2 and negative in Period 3, but none are statistically significant. *Europe* responds only in the most recent period (2018–2023), while *Other* origins, including the US, show significant effects primarily in Period 2

(2014–2017). This may reflect different FDI motives: Asian investors often pursue export-platform FDI, linked to exports to other countries, whereas Europe and Other origins may prioritize market access or vertical FDI, making the trade–FDI link more visible. Future analysis that interacts host and origin regions with trade interdependence provides a clearer and more detailed picture of these relationships.

Model 4, which interacts host and origin regions with trade interdependence, provides a clearer and more detailed picture of these relationships. Indeed, FDI is significantly stronger between *Europe Core* hosts and all origin groups (*Asia, Europe, Other*), with coefficients around 0.48–0.50, and similarly for *Emerging Hubs* hosts with *Asia and Europe* origins. *Neutral States* also exhibit strong trade-FDI complementarity, particularly with *Asia* (0.65***) and *Europe* (0.49***). These results underscore that trade interdependence has the most substantial impact when both host and origin regions are considered, capturing the heterogeneity in global FDI patterns.

The increasing role of Asian origins is further shown in Model 5, where both *Emerging Hub* and *Non-Hub hosts* display a strong and significant association between trade with Asia and FDI before 2018 (*Pre-Period 3*). However, this effect weakens and becomes insignificant in the 2018–2023 period, suggesting that Asian-origin FDI was more trade-driven in earlier phases but has since shifted toward other motives, such as technology acquisition or export-platform strategies. In this context, countries such as Hungary, Poland, and Slovakia have become major destinations for investment especially from Asia, particularly from China, in sectors like electric vehicles (EVs), batteries, and semiconductors.

For *Europe Core and Non-European Core* hosts, trade with the EU had a negative association with FDI before 2018 (−4.2160**; −3.5985*) but turned positive in the most recent period (2018–2023) (1.6420; 0.5623), although the effects are not statistically significant (Model 5). This pattern may indicate a gradual adjustment in intra-European investment structures following regulatory and geopolitical shifts after 2020, such as Brexit and the introduction of new EU investment screening mechanisms.

Overall, the findings indicate that Asia and other non-EU countries are becoming increasingly important sources of FDI into Europe, signaling a shift in integration patterns beyond traditional EU boundaries. This transformation appears to be influenced by external geopolitical and economic factors, such as the US–China trade war, which likely encouraged Asian firms to diversify production bases and expand market access within Europe. In contrast, European-origin FDI exhibits more modest changes, reflecting a relatively stable trade–FDI relationship over time. In addition, the results emphasize that trade–FDI linkages vary across both temporal and regional contexts, and that distinguishing functional groups and FDI periods is essential for uncovering these evolving dynamics.

However, the non-significant and occasionally negative effects of trade interdependence for Asian investors (Models 3 and 5) suggest that not all FDI is primarily trade-driven. Instead, these patterns may reflect a shift toward strategic or export-oriented investment motives, where firms use European locations as production or distribution platforms for third markets.

Therefore, the Export-Platform Indicator (Z_{ijt}) becomes central in the next stage of the analysis, as it is incorporated into the gravity model to capture FDI aimed at serving external rather than domestic markets. This extension allows us to explore whether certain countries attract FDI not because of their domestic markets, but because of their strategic location for exporting to the EU or other nearby regions.

2.4.3 Export-Platform Strategies and Heterogeneity in FDI Drivers

This stage examines the role of host countries as export platforms and explores heterogeneity across origin regions, particularly contrasting Asian and Western investors. While geopolitical tensions and trade barriers (e.g., the U.S.–China trade war) are expected to influence FDI allocation, their effects are absorbed by the country–time fixed effects in the model. As a result, these tensions are controlled for but not directly estimated or reported in the regression results. This analysis helps identify both the strategic use of host countries as export platforms and the shifting geography of FDI driven by external shocks. Let:

- *i:* host country (e.g., where FDI affiliate is located),
- j: origin country (home country of FDI),
- *k:* third country (final market for exports),
- Z_{ijt}: Export-platform indicator from country *i* with respect to country *j.*

We extend the baseline gravity model (Equation 2.4) by introducing Equation 2.5, in which FDI from country *j* to country *i* also depends on trade with third countries *k:*

$$FDI_{ijt} = exp\left[\beta_0 + \beta_1 Trade\_I_{ijt} + \beta_2 \ln(Z_{ijt}) - \beta_3 \ln\left(dist_{ij}\right) + \beta_4 EU\_pair_{ijt} + \beta_5 BRI\_pair_{ijt} + \alpha_{i,t} + \delta_{j,t}\right] \times \epsilon_{ijt} \quad (2.5)$$

Here, Z_{ijt} captures the extent to which host *i* is connected to international markets via exports to third countries *k≠j*, while host-time ($\alpha_{i,t}$) and origin-time($\delta_{j,t}$) fixed effects are included. In addition to the baseline variables, we include several interaction terms between the export-platform indicator (Z_{ijt}), host and origin regions, and FDI periods to capture heterogeneous effects across time and geography. This allows for distinguishing between:

- Market-access FDI, proxied by $Trade\_I_{ijt}$, reflecting investments driven by direct trade relationships.

- Export-platform FDI, proxied by Z_{ijt}, capturing investments motivated by third-market export opportunities.

If the coefficient on Z_{ijt} is positive and significant, it means: FDI from origin country *j* tends to increase when host country *i* is well trade connected to third-country markets. This supports the export-platform FDI motive: investors from *j* are not just targeting *i*'s domestic market, but also using *i* as a base to reach other destinations. Conversely, if the coefficient is small or insignificant, FDI is more likely market-seeking or vertical. In this case, firms from *j* invest in *i* primarily to serve *i*'s domestic market (market-access motive) or to send outputs back to *j* (pure vertical FDI).

Table 2.5 reports five models based on Specification (2.5), integrating the export-platform indicator, Z_{ijt} *(lnZ)* and estimated using a PPML framework with origin-year and host-year fixed effects to capture country-specific time dynamics. Since Z_{ijt} (lnZ) already incorporates distance terms, $ln(dist_{ij})$ is excluded from the regressions. Including both would be conceptually redundant, even though the statistical correlations are low. For this reason, dyadic fixed effects also cannot be used when including distance or distance-adjusted variables, as dyadic fixed effects absorb all pair-level time-invariant variables, including distance and the export-platform indicator.

Moreover, *Trade_I, lnZ, EU_pair, and BRI_pair* variables account for both policy-driven and trade-related channels affecting FDI, while country-year fixed effects control for broader geopolitical or macroeconomic shocks. Specifically, Model 1 (Table 2.5) includes interaction terms between *lnZ* and *BRI* participation to assess how the role of the BRI evolves when FDI is oriented toward export-platform strategies, also taking into account recent trends. The estimation results are presented in Table 2.5.

Table 2.5: Gravity Model with Export-Platform Indicator

Model	(1)	(2)	(3)	(4)	(5)
Dependent variable	FDI	FDI	FDI	FDI	FDI
Trade_I	0.0645***	0.0695***	0.0685***	0.0644***	0.0682***
	(0.0105)	(0.0117)	(0.0114)	(0.0102)	(0.0092)
EU_pair	0.3957***	0.3723**	0.3451**	0.3440**	0.3713**
	(0.1484)	(0.1503)	(0.1592)	(0.1547)	(0.1553)
lnZ	0.2126	0.4756	0.0857	0.4992***	-0.0479
	(0.5034)	(0.5523)	(0.5297)	(0.1604)	(0.2454)
BRI_pair	2.1708**				
	(0.9616)				
lnZ × BRI_early	-0.0837				
	(0.0532)				
lnZ × BRI_late	-0.0915*				
	(0.0498)				
Europe Core × Period 2 × lnZ		1.9804**			
		(0.9941)			
Europe Core × Period 3 × lnZ		-1.4904**			
		(0.7589)			
Emerging Hubs × Period 1 × lnZ		-1.3201**			
		(0.6457)			

Table 2.5 (continued)

Emerging Hubs × Period 2 × lnZ		-0.7878			
		(0.6466)			
Emerging Hubs × Period 3 × lnZ		-0.9794			
		(0.6324)			
Neutral States × Period 1 × lnZ		0.4319			
		(0.6536)			
Neutral States × Period 2 × lnZ		-0.1640			
		(0.6847)			
Neutral States × Period 3 × lnZ		-1.1428**			
		(0.5270)			
Asia × Period 1 × lnZ			0.1970		
			(0.1372)		
Asia × Period 2 × lnZ			1.4555*		
			(0.8706)		
Asia × Period 3 × lnZ			-0.9025*		
			(0.4987)		
Europe × Period 1 × lnZ			0.0941		
			(0.1257)		
Europe × Period 2 × lnZ			1.4389*		
			(0.8628)		
Europe × Period 3 × lnZ			-0.8932*		
			(0.4927)		
Other × Period 1 × lnZ			1.3515		
			(0.8707)		
Other × Period 1 × lnZ			-0.8664*		
			(0.4882)		
Non-Asia × Non-Europe Core × lnZ				-0.4214***	
				(0.0898)	
Non-Asia × Europe Core × lnZ				-0.6175	
				(0.6044)	
Asia × Europe Core × lnZ				-0.2235	
				(0.6020)	
Non-Asia × Emerging Hubs × lnZ				-0.8588*	
				(0.4773)	
Asia × Non-Emerging Hubs × lnZ				-0.1837***	
				(0.0618)	
Asia × Emerging Hubs × lnZ				-1.0497**	
				(0.4794)	
ExportPlatformEU × Pre-Period 3 × lnZ					0.0158*
					(0.0086)
ExportPlatformEU × Period 3 × lnZ					0.0054
					(0.0075)
ExportPlatformChina× Pre-Period3×lnZ					0.0042
					(0.0182)
ExportPlatformChina × Period 3 × lnZ					0.0528***
					(0.0202)
_cons	8.7017*	0.4303	4.4769	10.9625	8.8599*
	(4.8847)	(11.8735)	(10.0424)	(9.0399)	(4.7445)
N	14387	14387	14387	14387	14387
r2_p	0.8225	0.8243	0.8237	0.8237	0.8231

Source: Author's elaboration.
Note: Standard errors in parentheses + p < 0.10, * p < .05, ** p < .01. Period numbers (1, 2, and 3) refer to the FDI periods described below: Period 1 = 2010–2013 (early take-off); Period 2 = 2014–2017 (surge and peak); Period 3 = 2018–2023 (downturn/rebound). "Non-Asia" refers to "Europe and Other" origins, "Non-Europe Core" refers to "Emerging Hubs and Neutral States" hosts.
ExportPlatformEU = EU (origin) × Non-EU Core. ExportPlatformChina = China (origin) × Non-EU Core.

In Model 1 (Table 2.5), the export-platform indicator (*lnZ*) remains the main focus, but its positive yet insignificant coefficient suggests heterogeneous effects, implying that access to third-country markets may influence FDI differently depending on the host region or investment phase. Notably, the BRI pair dummy is positive and significant (2.17**), suggesting that bilateral BRI participation still supports FDI.

Comparing the *BRI* results from Table 2.4 (Model 1) and Table 2.5 (Model 1), *BRI_early* was strongly associated with higher FDI when trade interdependence acted as a proxy for market access, while *BRI_late* showed no significant effect. In contrast, when focusing on export-platform orientation (*ln Z*), the interaction with *BRI_late* is slightly negative but significant, whereas *BRI_early* remains insignificant. This suggests a shift from trade-driven investment in the early period to a growing role of export-platform motives in the later phase. In addition, the coefficients on *EU_pair* and *Trade_I* are positive and statistically significant across all models (Models 1–5) in Table 2.5, confirming the presence of market-access FDI and strong regional integration within Europe in terms of FDI flows.

When interacting *lnZ* with regional groups and FDI periods (Model 2), *Europe Core* shows a strong positive effect in *Period 2* (2014–2017), suggesting that core European economies benefited from export-platform–oriented FDI, possibly as multinational firms consolidated production in Germany, France, and the Netherlands to serve broader regional markets. In Period 3 (2018–2023), the effect for Europe Core turns negative and marginally significant (–1.49, $p = 0.050$), suggesting a shift away from export-platform FDI amid supply chain restructuring, Brexit, and rising focus on Emerging Hubs. Earlier, in Period 1 (–1.32, $p = 0.041$), these economies had weakly developed export-platform roles, while Neutral States show a declining export-base potential in recent years.

Although the coefficient for *Emerging Hubs* in *Period 3* (Model 2) remains negative and statistically insignificant, it may indicate a gradual structural adjustment and diversification of FDI motives. By 2023, many Emerging Hubs (e.g., Poland, Hungary, and the Czech Republic) had solidified their roles as export-oriented production bases, making new FDI inflows less sensitive to the export-platform indicator (*ln Z*). Additionally, recent FDI has become more sector-concentrated, particularly in semiconductors, EV, and green industries, and the EU's investment screening mechanisms have further concentrated such projects in a few strategic hubs (e.g., Hungary). Moreover, growing geopolitical and policy uncertainties have increased cross-country heterogeneity within this group. Together, these factors make the aggregate relationships statistically weaker.

From the origin perspective (Model 3), both *Asian* and *European* FDI peak in *Period 2* (2014–2017) but weaken or turn negative in *Period 3* (2018–2023), likely reflecting structural shifts, sectoral concentration, and geopolitical or regulatory changes. The non-significant or negative coefficients in *Period 3* suggest that investment motives are largely shaped by host-country characteristics and should be considered jointly. To capture these dynamics, Model 4 interacts Asian and European origins with major host groups, highlighting which host–origin pairs drive export-platform FDI.

In Model 4, the results indicate that for *Asian* investors in *non-Emerging Hubs,* the coefficient (–0.18***) suggests that Asian FDI declines in hosts with stronger third-market linkages when these hosts lie outside *Emerging Hubs.* For *Europe Core* economies (Germany, France, and the Netherlands), export-platform motives appear relatively saturated, as these economies already serve as central nodes within highly integrated value chains. Although the coefficient for *Asia × Emerging Hubs* (–1.05**) is negative, this does not imply a decline of export-platform FDI. Rather, it indicates that *Emerging Hubs* have already matured into established export-platform economies, where export-oriented production has become a structural feature rather than a marginal driver of new investment. For Asian investors, particularly Chinese firms, this pattern reflects a shift from early trade-driven investment toward a more institutionalized export-platform model, in which production in Central and Eastern Europe (notably Hungary, Poland, and the Czech Republic) serves the wider EU market. *Non-Asian* investors also use these hubs, though to a lesser extent, underscoring the growing functional specialization and regional centrality of Emerging Hubs within Europe's FDI network.

Since, among Asian investors in Europe, China represents the dominant source of FDI, we distinguish Chinese investment from other Asian FDI and compare it with EU FDI to capture differences in origin-specific strategies and their impact on export-platform-oriented flows. To operationalize this, we construct new variables, *ExportPlatformEU* and *ExportPlatformChina*, described in Table A5 in Appendix A.

In Model 5, the interaction terms highlight the evolving export-platform role of EU and Chinese investors in non-Europe Core hosts. For *EU-origin* FDI, the coefficient is positive and weakly significant in the *pre-Period 3* (2010–2017) at 0.0158*, but becomes smaller and insignificant in *Period 3* (2018–2023), suggesting that export-platform motives for EU investors have stabilized. By contrast, *Chinese FDI* shows a strong and significant export-platform effect in *Period 3* (0.0528***), while it is negligible in the earlier period, indicating that China increasingly uses *Emerging Hubs* and *Neutral States* as strategic export bases in recent years.

Nevertheless, the empirical results in Tables 2.4–2.5 highlight the limitations of using the export-based indicator ($ln\,Z$) as a proxy for export-platform-oriented FDI. Negative or insignificant coefficients in several specifications suggest that $ln\,Z$ reflects only a portion of the factors influencing actual investment flows. Other factors, such as sectoral specialization, host-country characteristics, and strategic motives, play a dominant role in shaping FDI patterns. For instance, while Chinese FDI is rising in *Emerging Hubs* (Hungary, Romania, Slovakia), Japanese FDI has declined, signaling different strategic priorities. It shows that not all Asian FDI follows the same trade- or export-platform-driven logic. Meanwhile, countries with potential to become new export-platform hubs, such as Turkey or Albania, are attracting additional Asian projects due to cost advantages, geographic position, and integration with EU value chains. These results underscore that, although $\ln Z$ offers insights into trade-linked FDI, the empirical approach requires accounting for multiple heterogeneous determinants and their interactions.

The general results highlight the importance of distinguishing origin regions and host types, as well as investment periods, to capture the evolving trade–FDI dynamics.

Overall, the findings provide strong support for the export-platform hypothesis, showing that despite geopolitical tensions and rising trade barriers, Asian FDI, particularly from China, remains export-oriented toward regions integrated into European supply chains.

Together, the evidence from Tables 2.3–2.5 confirms that market-access and export-platform motives coexist in Europe's FDI landscape, with Chinese FDI shifting from early BRI infrastructure projects toward strategic-sector FDI, primarily in Emerging Hubs. These results provide robust support for the research questions addressed in this study.

2.5 Conclusions

This study provides new insights into the evolving dynamics of FDI and trade-based economic integration in Europe by combining traditional determinants of FDI, particularly EU membership, with emerging drivers such as trade interdependence, export-platform motives, and rising Asian influence. Using an augmented gravity model for 42 European host countries and their global partners (2010–2023) and incorporating the Trade Interdependence Index and Export-Platform Indicator, the results reveal that both market-access and export-platform motives coexist, but their relative importance varies across host types, investment periods, and origin regions. In particular, Chinese FDI has shifted from early BRI infrastructure projects toward manufacturing investments in Emerging Hubs, highlighting the changing nature of external influence in European FDI flows.

Descriptive analysis shows that trade dependency with non-EU partners experienced the fastest growth, increasing by 55% between 2011 and 2023. While European investors still dominate EU FDI inflows, their share has steadily declined, falling below 70% for the first time in 2019. Meanwhile, Asian investors are increasing their presence in Europe, with Asian economies now ranking among the top 10 trade partners in over half of European host countries. Future FDI is likely to concentrate in emerging production hubs such as Eastern Europe, the Balkans, and Turkey. Notably, China, Japan, Indonesia, Singapore, Taiwan, South Korea, and Viet Nam have steadily increased their trade interdependence with Europe year by year.

Based on ranked trade interdependence between countries and regions and FDI dynamics, host countries are classified as Integrated Europe Core, Emerging Strategic Hubs, or Neutral States, while origin countries are grouped as European, Asian, or Other. This classification allows for empirical analysis based on functional integration rather than formal EU membership.

The empirical results support the hypothesis that stronger bilateral trade interdependence is positively associated with higher FDI inflows (Tables 2.3-2.5). Europe Core countries (including Norway and Switzerland) and Emerging Hubs (including Turkey and Serbia) have seen increasing FDI over time (Table 2.4), despite not all being EU members. Together with the declining significance of EU membership and BRI participation variables (Table 2.3), these findings suggest that functional economic integration provides a more relevant framework than formal institutional classifications for explaining FDI and trade patterns in Europe. Splitting the sample into three periods (Table 2.4-2.5) captured more nuanced dynamics of FDI flows across different phases. At the same time, BRI participation alone does not significantly affect FDI, likely because projects are primarily loan-financed infrastructure initiatives, markets are already integrated, and time lags delay observable effects. When interactions with trade interdependence are considered, the BRI pair dummy becomes significant, that reflects the heterogeneous nature of hosts, where emerging hubs such as Serbia, Hungary, Montenegro, and Greece attract BRI-related investment, while core EU economies like Germany and France participate less.

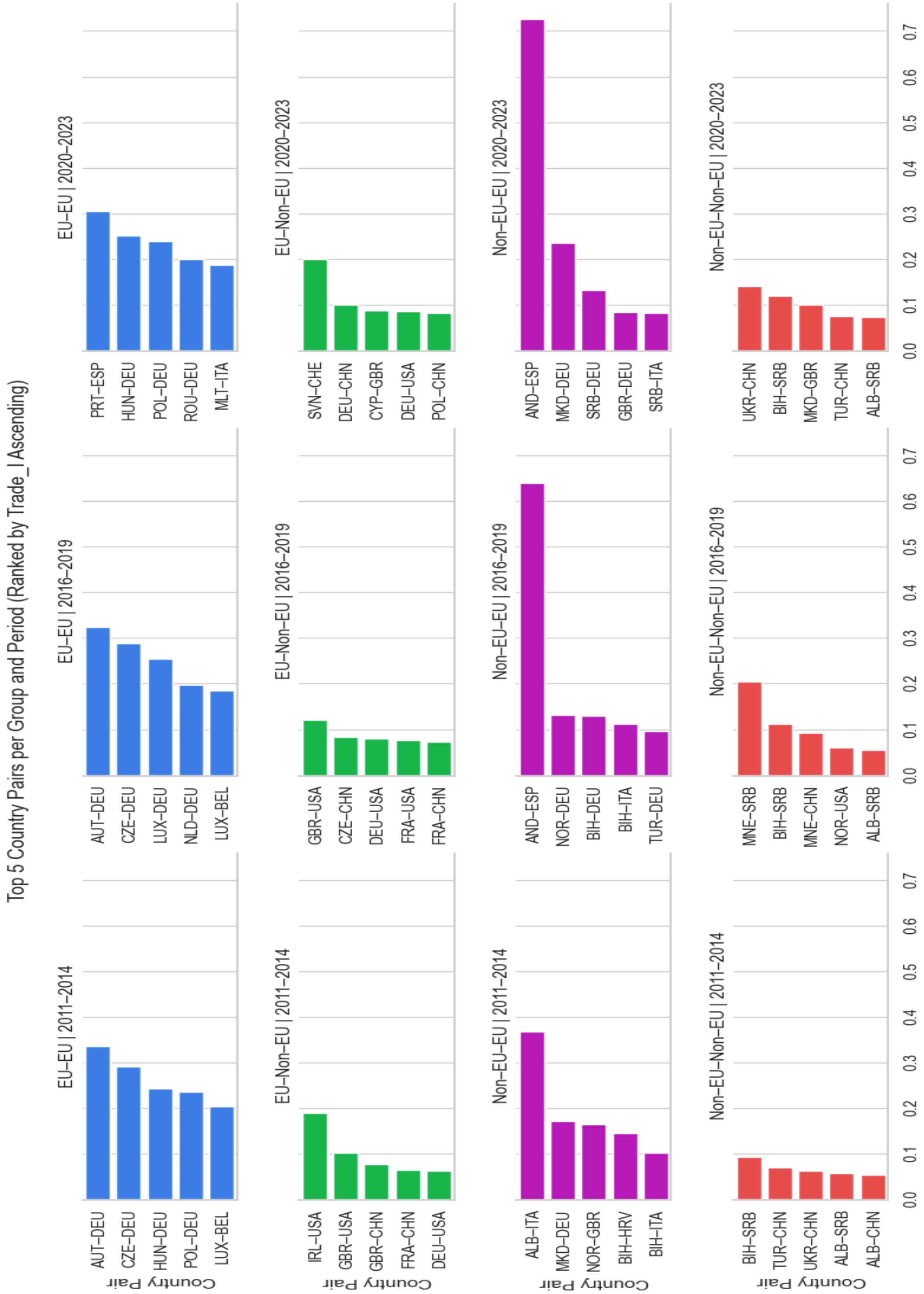
Incorporating the Export-Platform Indicator further suggests a shift in Chinese FDI from trade-driven motives in the early period toward a growing emphasis on export-platform strategies in the later phase (Table 2.5). Despite the limitations of using the export-based indicator as a proxy for export-platform-oriented FDI, the findings support this hypothesis. In Europe Core economies (Germany, France, and the Netherlands), export-platform motives appear relatively saturated, as these countries already serve as central nodes within highly integrated value chains. For Asian investors, particularly Chinese firms, this pattern reflects a shift from early trade-driven investment toward a more institutionalized export-platform model, with production in Central and Eastern Europe (notably Hungary, Poland, and Slovakia) serving the wider EU market.

At the same time, China, as the main Asian investor, has increasingly utilized the potential of Emerging Hubs and Neutral States as strategic export bases, particularly focusing on non-EU countries in recent years. By 2023, many EU Emerging Hubs (such as Poland, Hungary, and the Czech Republic) had already solidified their roles as export-oriented production bases, making new FDI inflows less sensitive to the export-platform indicator. Meanwhile, countries like Turkey, Serbia, and Albania have attracted new waves of Chinese FDI, reflecting their growing integration into European value chains. Together with the EU's investment screening mechanisms, these developments have further concentrated strategic projects in a limited number of key hubs. Moreover, rising geopolitical and policy uncertainties have amplified heterogeneity within this group.

Overall, this study contributes by integrating trade interdependence and export-platform perspectives within an augmented gravity framework to explain evolving FDI patterns in Europe. It highlights the growing role of Emerging Hubs and the shift of Chinese investment from infrastructure-driven to strategic, export-oriented FDI, offering new evidence on functional integration beyond the EU status and the changing geography of global value chains.

Appendix A

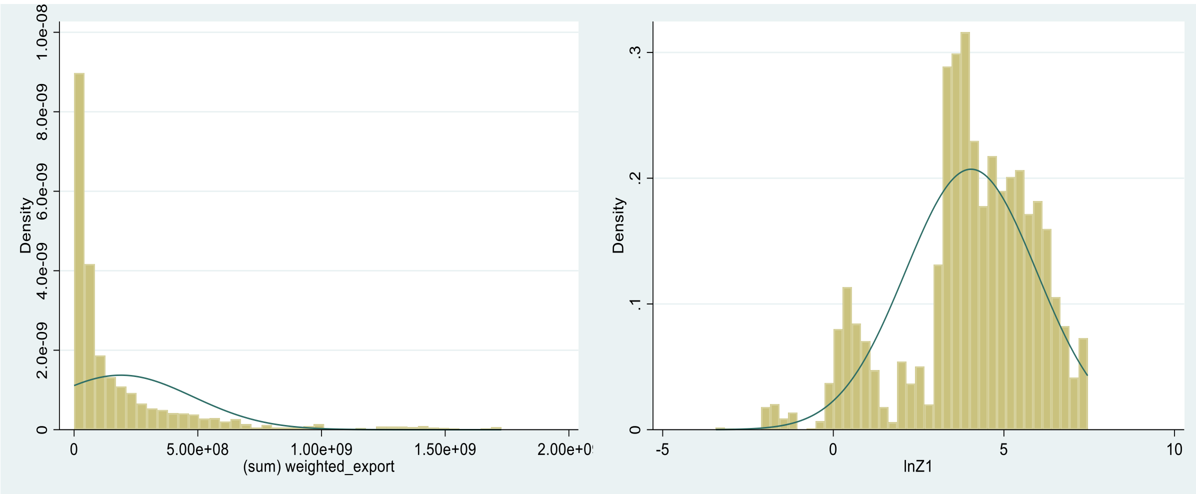
Figure A1: Top 5 Country Pairs by Trade Interdependence, by Group and Period



Source: Author's elaboration.

Appendix A

Figure A2: Comparison of the distribution of Zijt (left panel) and lnZ (right panel)



Source: Author's elaboration.

Table A1: Descriptive statistics of the main variables

Variable	Obs	Mean	Std. Dev.	Min	Max
fdi	14615	737.369	3896.941	0	125256.92
Trade_I	14615	2.034	4.147	0	72.845
ln_dist	14615	7.71	1.09	4.007	9.808
lnZ	14564	4.038	1.926	-3.44	7.454
ln_gdp_h	14615	11.852	1.784	7.934	15.31
ln_gdp_o	14615	13.188	1.556	9.34	17.125
EU_host	14615	.694	.461	0	1
EU_origin	14615	.566	.496	0	1
EU_pair	14615	.383	.486	0	1
comlang_off	14615	.04	.197	0	1
comrelig	14615	.153	.253	0	.96

Source: Author's elaboration.

Table A2: Pearson correlation matrix of the main variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) fdi	1.000										
(2) Trade_I	0.167	1.000									
(3) ln_dist	-0.111	-0.300	1.000								
(4) lnZ	0.099	0.018	0.002	1.000							
(5) ln_gdp_h	0.149	-0.005	0.060	0.558	1.000						
(6) ln_gdp_o	0.106	0.321	0.361	-0.004	0.005	1.000					
(7) EU_host	0.071	0.027	0.053	0.448	0.366	-0.004	1.000				
(8) EU_origin	0.043	0.182	-0.653	-0.036	-0.048	-0.219	-0.043	1.000			
(9) EU_pair	0.080	0.166	-0.461	0.226	0.172	-0.164	0.524	0.690	1.000		
(10) comlang_off	0.171	0.220	-0.136	0.026	0.028	-0.005	0.014	-0.014	-0.007	1.000	
(11) comrelig	0.128	0.153	-0.309	0.107	0.080	-0.025	0.179	0.267	0.337	0.159	1.000

Source: Author's elaboration.

Appendix A

Table A3: First-Stage Regression (Instrument Strength Check)

HDFE Linear regression Absorbing 2 HDFE groups Statistics robust to heteroskedasticity Number of clusters (host_origin) = 1,388	Number of obs = 14,615 F (5, 1387) = 23.64 Prob > F = 0.0000 R-squared = 0.5725 Adj R-squared = 0.5369 Within R-sq. = 0.2765 Root MSE = 2.8363

Trade_I	Coefficient	St.Err.	t-value	p-value	[95% Conf	Interval]
Z_rank_norm	-1.768	0.576	-3.070	0.002	-2.899	-0.638
ln_dist	-2.725	0.354	-7.700	0.000	-3.420	-2.031
comlang_off	3.333	1.356	2.460	0.014	0.673	5.992
comrelig	0.256	0.499	0.510	0.609	-0.724	1.235
EU_pair	0.480	0.335	1.430	0.153	-0.178	1.138
_cons	23.629	2.654	8.900	0.000	18.423	28.835
**** p<.01, ** p<.05, * p<.1*						

Source: Author's elaboration.

Table A4: Second-Stage PPML Estimation with Control Function Residual

FDI	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
EU_pair	.38	.152	2.50	.012	.082	.677	**
Trade_I	.065	.033	1.97	.049	0	.129	**
lnZ	.325	.64	0.51	.611	-.93	1.581	
cf_resid	-.004	.035	-0.12	.901	-.073	.064	
lnZ×ln_gdp_h×ln_dist	-.001	.001	-1.67	.094	-.002	0	*
Constant	3.515	11.918	0.29	.768	-19.844	26.874	

Mean dependent var	749.055	SD dependent var	3926.586
Pseudo r-squared	0.824	Number of obs	14387
Chi-square	111.928	Prob > chi2	0.000
Akaike crit. (AIC)	9063388.316	Bayesian crit. (BIC)	9063433.760
**** p<.01, ** p<.05, * p<.1*			

Source: Author's elaboration.

Appendix A

Table A5: Description of independent variables in the FDI gravity model

Variable	Subscript	Description
EU membership	*EU_pair*	Dummy = 1 if both countries are EU members, 0 otherwise
BRI participation	*Bri_pair*	Dummy = 1 if both countries are BRI members, 0 otherwise
Trade Interdependence	*Trade_I*	$= \frac{(\text{Imports}_{ij,t} + \text{Export}_{ij,t})}{\text{Total Trade of i with the world}_t} \times 100$
Export-platform indicator (log)	lnZ_{ijt}	$Z_{ijt} = \sum_{k \neq j} \frac{\text{Exports}_{ikt}}{\text{Distance}_{ik}^{\delta}}$
Early BRI participation (initial expansion phase)	*BRI_early*	Dummy = 1 if both countries are BRI members during 2013–2018, 0 otherwise
Late BRI participation (recent investment phase)	*BRI_late*	Dummy = 1 if both countries are BRI members during 2019–2023, 0 otherwise
FDI Periods	*1,2,3*	Period 1 = 2010–2013 (early take-off); Period 2 = 2014–2017 (surge and peak); Period 3 = 2018–2023 (downturn/rebound)
Interaction terms		
Trade Interdependence by Country Group	*EU–Non-EU × Trade_I*	Interaction between *Trade_I* and cases where host is EU and origin is Non-EU
	Non-EU–EU × Trade_I	Interaction between *Trade_I* and cases where host is Non-EU and origin is EU
	Non-EU–Non-EU × Trade_I	Interaction between *Trade_I* and cases where host is Non-EU and origin is Non-EU
Trade interdependence with Asia origin	*Trade_Asia*	Interaction: *Trade_I × Asia (origin country)*
Trade interdependence with EU origin	*Trade_EU*	Interaction: *Trade_I × EU (origin country)*
Export-platform EU	*ExportPlatformEU*	Captures the export-platform effect for EU investors in Emerging Hubs and Neutral States (Non-EU Core hosts): *EU(origin) × Non-EU Core*
Export-platform China	*ExportPlatformChina*	Captures the export-platform effect for Chinese investors in Emerging Hubs and Neutral States (Non-EU Core hosts): *China(origin) × Non-EU Core*

Source: Author's description and calculations.

Appendix A

Table A6: Country Classification by Functional Integration

HOST COUNTRIES		
Group	**Definition**	**Countries**
Integrated Europe Core	Countries with high and stable FDI inflows, advanced economies, and deep trade integration, typically long-standing EU members. Norway and Switzerland are included due to harmonized trade regimes, and the United Kingdom is treated as main trades partner both during its EU membership up to 2020 and thereafter.	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom (UK)
Emerging Strategic Hubs	Countries that have seen growing FDI inflows and serve as key production or investment locations, especially in Eastern and Southeastern Europe.	Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czechia, Estonia, Hungary, Iceland, Kosovo, Latvia, Lithuania, Malta, Montenegro, North Macedonia, Poland, Moldova, Romania, Serbia, Slovak Republic, Slovenia, Turkey, and Ukraine
Neutral States	Countries with limited or specialized trade–FDI roles, often peripheral economies or financial hubs, exhibiting extreme dependence on a single trade partner.	Albania, Andorra, and Belarus
ORIGIN COUNTRIES		
EU countries	These origins represent advanced economies with consistent FDI outflows and strong trade ties within Europe, typically long-standing EU members, with the UK included as a main trade partner up to 2020.	Austria, Belgium, Croatia, Cyprus, Czechia, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovak Republic, Spain, Sweden, United Kingdom (UK) up to 2020
Asia	These origins are major emerging and developed economies with growing FDI and trade connections to Europe.	China (*inc.* Hong Kong), Indonesia, Japan, Korea, Rep., Malaysia, Philippines, Singapore, Taiwan, Thailand, Viet Nam, India
Other	This group includes non-EU European countries with harmonized economic relations with the EU (Norway, Switzerland), along with the USA as one of the main investors and trade partners. UK was included after 2020.	Australia, Albania, Serbia, Norway, Switzerland, UK (since 2020), USA (US)

Source: Classification developed by the author using regional economic and FDI patterns.

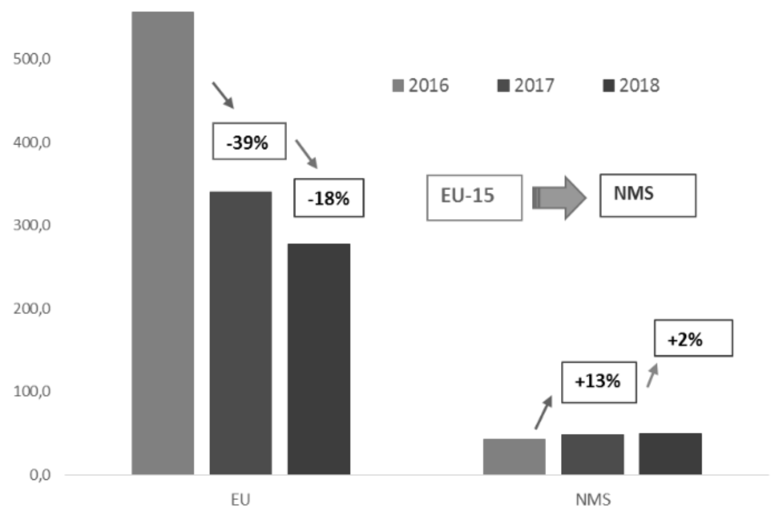
3 A Gravity Model Analysis of FDI across EU Member States[1]

3.1 Introduction

For years, the European Union (EU) has been the largest destination for foreign direct investment (FDI). At the same time, it has been the leading source of outward investment in the world, accounting for more than one-third (35%) of the world's inflows and about two-fifths (41%) of global outflows. According to OECD data, since 2018 FDI to the EU has declined in line with the downward trajectory of global investment. However, the EU's share of global FDI inflows has remained stable and accounted for 22%–23% in 2017–2018.

While FDI flows to the EU as a whole decreased, investment in the new EU member states (NMS) increased by an average of 10% in 2016–2018 (Figure 3.1). In fact, since Poland, Hungary, the Czech Republic, and other Central and Eastern European Countries (CEECs) joined the EU in 2004, FDI inflows have risen sharply, reaching almost $49 billion in 2018. Seemingly, NMS have benefited from joining the EU, making EU membership one of the most influential FDI determinants.

Figure 3.1: FDI Inflows to the EU and New Member States (USD Million)



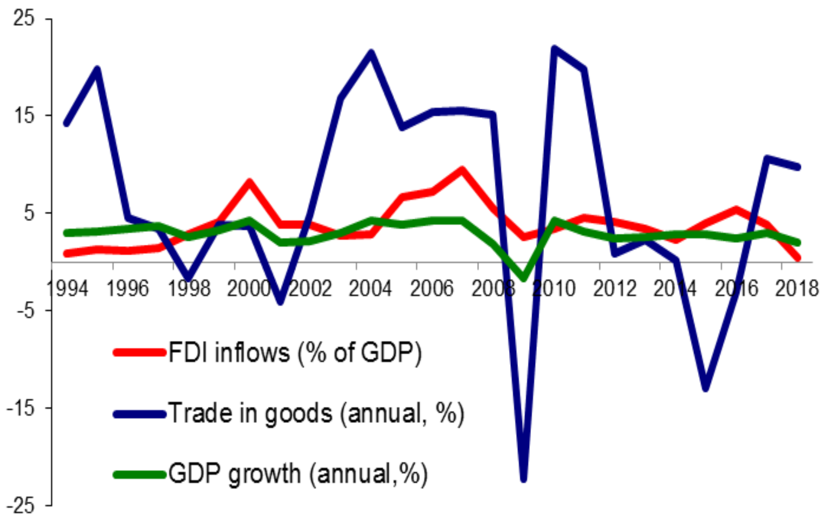
Source: Calculated and drawn by the author based on World Bank and OECD data.

More than 70% of FDI to the NMS come from a few large investors within the EU. The leading investment partners are Germany, France, Austria, the Netherlands, and Luxembourg. The most attractive destinations are Poland, Hungary, the Czech Republic, and Slovakia. Before the EU enlargement in 2004, EU founders and early members

[1] This chapter reproduces the author's previously published work: Dorakh, A. (2020). *A gravity model analysis of FDI across EU member states. Journal of Economic Integration, 35*(3), 426–456. https://doi.org/10.11130/jei.2020.35.3.426

enjoyed the lowest trade and operation costs compared with the largest non-EU economies (the U.S., China, Japan, and Russia), as well as compared with the rest of the world. Within the enlarged EU, the accession countries offered new markets, competitive production costs, and relatively low limitations for the flow of goods and capital across borders. Basically, with the formation of the EU, trade and FDI fell between EU and non-EU members, while intra-EU FDI rose. FDI inflows to NMS have increased drastically. Thus, EU membership had a prominent role in fostering FDI growth in the NMS. Furthermore, FDI inflows have grown much faster than either GDP or trade in the EU (Figure 3.2).

Figure 3.2: EU's GDP and Trade Growth with FDI (% of GDP) over Time



Source: Calculated and drawn by the author based on the World Bank and OECD data.

Figure 3.2 identifies the important links connecting FDI and GDP growth: the richer and larger countries become, the bigger and more intense the FDI inflows that occur. Economy size matters. It is clear evidence of strong gravity effects in the FDI patterns. Meanwhile, differences in trade and FDI growth suggest that FDI is mainly complementary to trade, rather than a substitute for it. Low trade costs and production costs, which capture differences in factor endowments, facilitate more FDI. Similarly, higher labor costs make the cost of production larger and reduce FDI. For accession countries in the EU enlargement, the most relevant FDI determinants are market-seeking (horizontal FDI) and efficiency-seeking (vertical FDI).

EU enlargement was not a single event but a process that continued over time, shaping new determinants and forms of FDI across countries. In addition to traditional forms of FDI, the further relaxation of investment frictions within ongoing integration also stimulated investment in technology capital.

This coincided with the remarkable rise of Chinese investment in the framework of EU–China technology transfer. While developed countries still account for the dominant share of the EU's FDI inflows, the share of Chinese investment in the EU has doubled over the last five years. This has produced a new Knowledge-Capital model of FDI, as well as a complex vertical FDI strategy. In recent years, policymakers in the EU have liberalized policies to attract more FDI. At the same time, they are screening purchases by foreign companies that target Europe's assets. In other words, governments are increasingly interested in the determinants and reasons for FDI activity in the EU, and particularly in the NMS.

This paper seeks to examine patterns of FDI across the EU, identify the main determinants in selected member states, and, most importantly, estimate whether EU membership fosters FDI in accession countries and to what extent.

Stimulated by the influential FDI and trade papers that evaluate FDI determinants, we propose a gravity model for 6 host and 33 source countries over the period 1991–2017. The key adjustment that we propose to gravity estimates is to allow for possible simultaneous FDI diversion as well as FDI creation of EU membership in the EU countries. Our empirical analysis provides solutions for challenges in gravity estimation, such as not accounting for multilateral resistances (MRs), the omission of zero and negative observations, and endogeneity of EU variables, which lead to severe estimation bias. Capitalizing on the latest literature, we propose a comprehensive estimating gravity specification with a full set of fixed effects that simultaneously identify the impact of bilateral and country-specific FDI determinants.

The paper is structured as follows. In Section II, we provide the most influential FDI theories and review the empirical literature on FDI determinants. In Section III, we describe the stages of the analysis and report our empirical results. Section IV includes conclusions and policy implications..

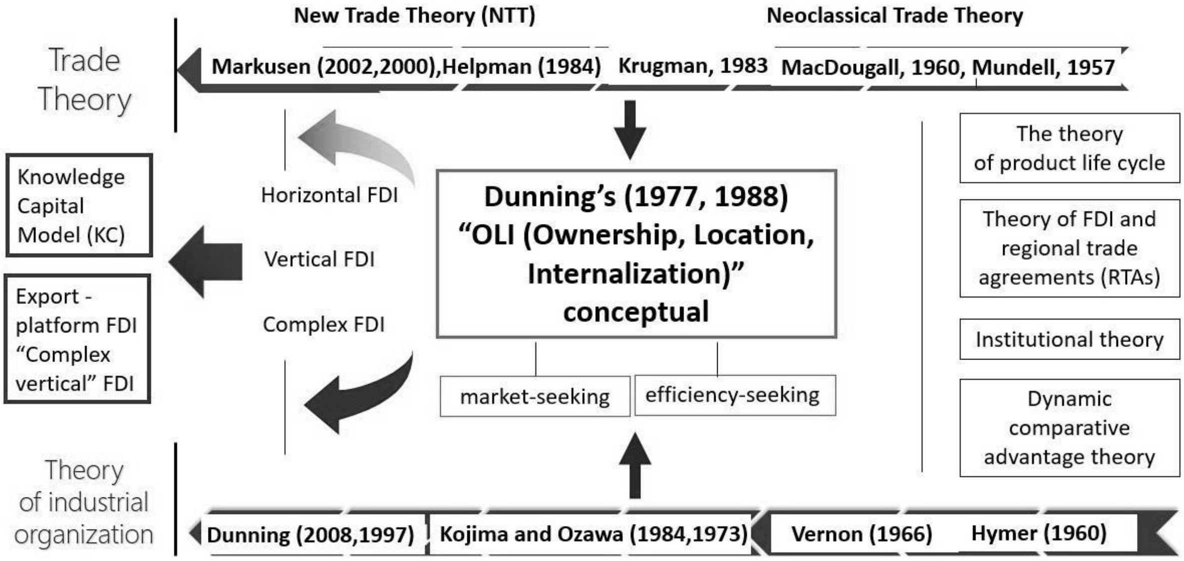
3.2 Theoretical Background of the FDI

3.2.1 Theories of FDI

FDI is a complex phenomenon that cannot be explained by a single universal theoretical model. Determinants of FDI vary across countries and regions and change their nature over time. They are better understood using a variety of theories, which are mostly derived from the Neoclassical Trade Theory and the New Trade Theory (NTT), as well as from theory of industrial organization (Figure 3.3).

As seen in Figure 3.3, until the 1950s, FDI was entirely explained within the traditional neoclassical theory of international capital movements (MacDougall, 1960; Mundell, 1957), where FDI is a result of capital flowing from the capital-abundant countries to the capital-scarce countries. In fact, FDI between countries of similar size and relative factor endowments is not observable. However, over the last five decades, developed countries, which are capital-abundant, have received a larger share of FDI flows (World Investment Report, 2018). Another critical point of neoclassical FDI theory is that under perfect competition a firm is not considered as an independent economic agent that contradicts the theory of industrial organization.

Figure 3.3: Theories and Conceptual Frameworks of FDI



Source: Drawn by the author.

Alternatively, within the theory of industrial organization, many conceptual frameworks have been proposed to explain why firms internationalize production and become multinational corporations (MNCs) (Figure 3.3). One of them is the theory of product life cycle, which was developed by Vernon (1966). According to this theory, firms begin FDI activity abroad when an innovative product reaches maturity in the source country. Initially, firms create a product for the domestic market and export the surplus. Then, to become more competitive domestically, the producer invests in manufacturing facilities in other countries. While this theory explains the shift from export to FDI, it does not sufficiently explain the determinants of FDI. In this case, FDI is motivated by firm-specific factors without the consideration for the local factors of host countries.

The shortcomings of the previous theories led to Dunning's (1977) "OLI (Ownership, Location, Internalization)" conceptual framework that later became a canonical framework of FDI determinants, integrating elements from trade and international business literature. According to the theory, there are two main reasons why firms become MNCs: market-seeking and efficiency-seeking.

The first type of FDI activity implies that firms intend to overcome the geographical and cultural distance between countries to gain access to new foreign markets. The second type of FDI refers the investment activity between countries based on a difference in relative factor endowments.

From the late 1970s, following the development of the NTT, MNCs became more visible, and FDI determinants were explicitly modeled. The NTT gives two main reasons for a firm to internationalize production: market access and efficiency-seeking within the frameworks of horizontal and vertical FDI (Figure 3.3).

Horizontal FDI refers to producing goods in foreign countries when the benefits of producing abroad outweigh the losses of economies of scale from producing at home. Access to new markets seems to be a more common reason for multinational FDI activity. In this case, horizontal FDI occurs mostly between developed countries with similar factor endowments and market size.

The proximity of the host markets allows firms to save trade costs but induces the fixed costs of creating a new plant abroad. In fact, MNCs prefer to enter the foreign market via FDI rather than through exporting with higher trade costs. Hence, horizontal firms intend to save trade frictions (transportation costs, tariffs, and other trade barriers to entry to the host market), so horizontal FDI substitutes for trade.

Vertical FDI is related to the growing fragmentation of the production process to decrease costs. Here, MNCs locate each production stage in the country with the more competitive factors of production. Reducing transportation and operation costs between developed and developing countries boosts the efficiency-seeking strategy of the MNCs. Due to the fact that vertically integrated companies split up the production process across different locations to reduce trade costs, vertical FDI complements trade.

For a long time, horizontal and vertical FDI models have been treated as two different strands in the literature. Twenty years ago, Markusen (2002) combined the horizontal and vertical models into a hybrid framework, called the Knowledge-Capital Model (KC) (Figure 3.3).

The main advantage of the KC is that national, horizontal, and vertical multinational firms can coexist, based on various host- and source-country characteristics. Namely, vertically integrated MNCs locate their headquarters services (research, advertising) in the skilled-labor, capital-abundant parent country and move their unskilled-labor activities to the host country abundant in unskilled labor. When the main part of the output comes back to the home country, this two-country FDI is known as "pure vertical FDI" (Markusen, 2002). Because those vertical MNCs will re-export products back to their home country, the impact of the surrounding market potential will be ambiguous.

Recently, the KC model was extended in many directions (Bergstrand & Egger, 2007; Markusen, 2013). One of the most important extensions of this framework is that, in addition to human capital, physical capital was incorporated into the FDI model.

Another important extension of the KC model was supported by Baltagi, Egger, and Pfaffermayr (2007), who propose the inclusion of an agglomeration effect in the model. This type of FDI is known as "complex vertical FDI" (Figure 3.3) and occurs when a multinational firm decides to relocate aspects of its production processes to different neighboring countries with more favorable factor conditions. Broadly speaking, the complex vertical MNCs exploit relative factor-price differentials by splitting up and relocating their production in a complex manner.

As in the pure vertical model, MNCs locate their headquarters services (management, R&D, and advertising) in the skilled-labor-abundant parent country, but in contrast to the pure model, MNCs put their unskilled-labor activities not only in the host country but also in a neighboring third country. As expected, all partners benefit, and more importantly, the third country benefits from the complex FDI model (Blonigen, Davies, Waddell, & Naughton, 2007).

Overall, according to both horizontal and KC models, there is a positive relationship between similarity in relative country size and FDI activity. On the contrary, in all types of vertical models, similarity in country size does not play any role in the determination of FDI.

In general terms, theories of FDI explain only part of the determinants of FDI. Real-world trends have led to a substantially larger number of factors that trigger FDI activity and require empirical investigation.

3.2.2 Review of the Empirical Literature on FDI Determinants

The amount of empirical FDI literature is large, and we have referred to the most frequently cited papers for our analysis. We considered papers that distinguish robust determinants of FDI distribution in the EU, particularly, in the NMS. We mainly examined trade gravity literature that allowed us, by analogy, to establish and test causal links between bilateral FDI flows and their determinants in selected countries. We also studied papers that recognize EU membership as a key determinant of increasing FDI inflows in the NMS.

Consistent with the highly recommended trade papers (Anderson & Van Wincoop, 2003; Yotov et al., 2016) and FDI studies (Blonigen et al., 2007; Brainard, 1997; Pain, 1993; Welfens & Baier, 2018), we confirmed that the best-fitting model for estimating determinants of bilateral FDI flows is a gravity model. Namely, canonical gravity models indicate a negative impact of the geographical distance between the countries of origin and destination. In contrast, there is a positive impact of GDP on FDI flows, in this study.

In the early days, the standard gravity model was applied mostly to horizontal FDI (Blonigen, 2005; Blonigen et al., 2007), but recent methodology of the structural gravity model provides further foundations that combine horizontal and vertical FDI (Baier, Yotov, & Zylkin, 2019; Bergstrand & Egger, 2007; Bruno, Campos, Estrin, & Meng, 2017; Carr, Markusen & Maskus, 2001), establishing KC and complex vertical FDI.

Despite the fact that the FDI patterns show clear gravity characteristics, the empirical literature focuses mainly on the estimation of the trade gravity model and only partly on FDI. The most influential study in this area comes from Baier and Bergstrand (2007), who first designed a panel data FDI analysis and highlighted endogeneity issues. In parallel with the trade literature, many of the current FDI models present challenges with gravity estimations and suffer biases, which should be avoided.

To do so, we extended earlier literature and applied FDI gravity model practice recommendations from some influential recent papers (Anderson, Larch, & Yotov, 2017, 2019; Baier et al., 2019). Specifically, we used an estimation of the structural FDI gravity model, modified to account for multilateral resistances with an appropriate set of fixed effects. For FDI gravity, this approach has not been massively applied. Thus, we implemented these latest developments from the literature.

To obtain reliable estimates of the FDI gravity model, we first created a model with country-specific fixed effects to cover the origin- and destination-country individual factors. Second, to adequately control for the dynamic forces in our model, we combined country-specific fixed effects with time fixed effects. Third, we added pair-fixed effects as a powerful tool to avoid endogeneity and control for all time-invariant bilateral costs. In the end, we tested a model with a full set of fixed effects using ordinary least squares (OLS) and Poisson Pseudo-Maximum-Likelihood (PPML) estimators.

One clear drawback of the current practice of estimating an FDI model is the presence of zero and negative values in the FDI data. In this case, the widely used OLS estimator is not acceptable because data is simply dropped from the estimation sample when the values are transformed into a logarithmic form. Often, authors (Blonigen et al., 2007; Campos & Kinoshita, 2008; Davies, 2003) avoided this challenge by measuring FDI as a stock variable or by using MNCs' affiliate sales as a dependent variable. By quantifying FDI in stock metrics, all positive and negative changes in FDI values were offset during the year. It could be a decision, but FDI stock is a static variable that implies an investment position of a country only at one specific time, at the end of the year, for example. Multinational affiliate sales (Asiedu, 2006; Carr, Markusen, & Maskus, 2001; Gupta, 2017) identified effects of the plant location decision and represented more firm-level policies, rather than macro-level objectives.

Alternatively, FDI is measured as a share of FDI values in GDP or taken in the model as variable FDI inflows per capita. Sometimes, FDI flows can be quantified as a percentage of gross fixed capital formation for the country (Contessi & Weinberger, 2009). However, these variables provide a measure of the relative size of FDI. To estimate models for the total value of FDI and its dynamic patterns, a flow variable is a better metric for FDI. From this point of view, we extended the FDI literature (Brainard, 1997;

Dellis, Sondermann, & Vansteenkiste, 2017; Wong & Tang, 2011) and propose using FDI flows, which would also be more appropriate for measuring integration.

On the contrary, the value of FDI flows is a dynamic variable and should be expressed in logarithmic form. The challenge of negative and zero FDI values are also sustained. The problem has become more pronounced recently because there is a considerable decline and disinvestment in global FDI flows across all countries. To avoid issues with logarithmic transformation of negative values, negative and zero FDI values are often removed from the sample. As a result, disinvestment or reinvestment outside the country is not counted, and FDI inflows may be underestimated. The specification becomes theoretically inconsistent.

As an econometric solution, we suggest replacing negative FDI flow values with a very small constant, the value of one dollar, for instance. This approach is convenient and could be effective for our model because the dependent variable is measured in millions and adding a completely arbitrary value does not disturb the interpretation of the coefficients. Even the double-log model can be estimated without excluding these country pairs from the sample.

To solve the problem of zero FDI, we followed Silva and Tenreyro (2006) by using the PPML estimator, which is also a valid method to account for the presence of heteroskedasticity in the sample.

While the main gravity determinants of FDI are mostly established in previous studies, the question of how EU membership affects FDI inflows to the accession countries remains uncertain. Initially, empirical studies for selected countries included a cross-country analysis and treated the entire region jointly (Brakman, 2008; Smarzynska & Wei, 2000). Later, some authors identified the main reasons for inward FDI flows to a single country or group of countries in the EU (Cieslik, 2017, 2019; Pirlogeanu, 2017).

The most advanced recent study is the paper by Bruno et al. (2017), in which the authors created a model for bilateral FDI flows of 35 OECD countries from 1985 to 2012 with pair- and time-fixed effects. They applied the study directly to Brexit, assuming that losses would be opposite to the gains from EU membership. Another important study about the effects of Brexit on FDI flows in the EU comes from Welfens and Baier (2018), where the authors examined the period from 1985 to 2012 for a dataset of 34 OECD countries, using PPML dyadic fixed-effect estimations. In contrast to our goal, these papers emphasized the impact on FDI of leaving, instead of joining, the EU.

A recently published working paper by Sondermann and Vansteenkiste (2019) concluded that bilateral FDI inflows are at least 50% higher if both host and source countries are in the EU. This is mainly driven by the effects of reduced trade costs and specific FDI factors.

While it is important to examine this area in the context of increased protectionism, and recognizing that the role of EU membership is not the same for all EU members, we created and estimated diverse models. In addition to the previous literature (Bevan & Estrin, 2004; Bergstrand, Larch, & Yotov, 2015; Bruno et al., 2017), we split the impact of EU integration among the new and old EU member states.

For this, we used various methods and compared our results with one another as well as with existing studies. Moreover, we showed that the announcement about future EU enlargement is even more statistically powerful for FDI than an official accession date.

3.3 Empirical Analysis of FDI Determinants in the Selected EU Countries

3.3.1 Gravity Model of Bilateral FDI Flows

To investigate the key factors that affect FDI, we present a series of empirical models that estimate FDI determinants. In particular, we estimate the effects of EU membership in selected countries. Because the essential FDI gravity model was estimated with OLS (Bergstrand & Egger, 2007), we started from this standard estimator. We adopt a partial equilibrium framework, modeling FDI flows as a function of bilateral factors without simultaneously accounting for other interconnected markets (e.g., trade or labor). We employ panel data analysis to control for heterogeneity across countries. In this context, FDI theory does not provide direct guidance for structural gravity estimation.

By making an analogy with a new trade gravity approach for a non-linear equation, we included "remoteness indices" or multilateral resistances, which consistently aggregate trade costs and FDI barriers for each country. Accordingly, changes in trade policy anywhere in the global system can impact FDI in any country.

To control for unobservable country-specific factors, we first included host- and origin-fixed effects, and time dummies. Next, we employed a country-pair fixed-effects model to control for all time-invariant bilateral variables. To provide robustness, the regression is clustered by country pairs to account for any intra-cluster correlations at the country-pair level. Finally, we employed PPML for the model combining host- and source-time fixed effects with pair-fixed effects.

Following the idea that the impact of determinants on FDI depends on the FDI strategy, we can suppose that two main groups of FDI determinants are crucial: the economic size of the country (for horizontal FDI) and factor endowments (for vertical FDI). Thus, the coefficient of GDP is expected to be positive for the host country. Similarly, a greater labor cost makes the cost of production higher and hence causes lower FDI inflows. EU membership, by liberalizing FDI, increases FDI inflows. According to gravity theory, there is a positive correlation between FDI inflows and GDP, while FDI inflows and distance are negatively correlated. FDI is inversely related to FDI barriers.

Our FDI gravity estimation covered 39 OECD countries between 1991 and 2017. The data represents more than 70% of world FDI inflows (in millions of USD). Because all countries are OECD members, data were collected with the same methodology. Thus, the sample seems to be of relatively high quality.

Our dependent variable is bilateral FDI flows between the largest new EU member recipients (Poland, Hungary, the Czech Republic, Estonia, Slovakia, and Slovenia) and 33 origin countries. We started from the biggest investors for the selected destinations: Germany, France, Austria, the USA, UK, the Netherlands, Italy, Luxembourg, Belgium, Canada, Denmark, Australia, Chile, the Czech Republic, Estonia, Finland, Greece, Hungary, Iceland, Ireland, Israel, Japan, South Korea, Mexico, Norway, New Zealand, Poland, Portugal, Slovakia, Spain, Sweden, Switzerland, and Turkey. For years prior to 1993, Czechoslovakia's aggregate FDI inflows were distributed between the Czech Republic and the Slovak Republic in proportion to their respective GDP shares in 1990.

The main part of the sample is based on FDI inflow data by partner country from the OECD BMD4 data set over the period 1998–2013.

To obtain the required level of disaggregation and provide consistent results, we extended the sample and collected the earlier (1991–1997) and the later (2014–2017) bilateral FDI data from national central banks. Overall, the total number of observations was 33 (sources)*6 (hosts)*27 (years) = 5,346. Missing FDI values were reflected by zeros (Bevan & Estrin, 2004).

To estimate our FDI gravity model, FDI data was merged with the World Development Indicators in terms of the GDPs of the host and source countries, measured in millions of USD. As a proxy for labor costs, we used unit labor costs (ULC) data from the OECD, calculated as the ratio of total labor compensation per hour worked to output per hour worked. The gravity bilateral characteristics (distance, colony, and common language) came from the CEPII dataset.

Because negative FDI flows have real economic meaning, these values cannot be omitted without losing consistency. For our purposes, we also could not set negatives to zero because it would mean that the investment relationships between host and origin countries did not exist. Unlike true zero investment, we suggest transforming negative FDI flows to $1. Because FDI and GDP are measured in millions, adding a completely arbitrary value should not disturb the consistency of the model. While it is indeed a strong assumption, we provide estimates for both the model with negatives removed and the transforming-negatives model. We prove that dropping negative flows would result in bias. In contrast, estimating FDI as $1 produces more robust results than treating negative values as zero.

Our baseline FDI gravity model with 1-year interval data (specification 3.1) is:

$$\begin{aligned} lnFDI_{ijt} = {} & \beta_0 + \beta_1 lnGDPHost_{it} + \beta_2 GDPOrigin_{jt} + \beta_3 lndist_{ij} \\ & + \beta_4 comlangoff_{ij} + \beta_5 colony_{ij} + \beta_6 smctry_{ij} + \beta_7 ULC_{it} \\ & + \beta_8 EU\_memb_{ijt} + \beta_9 EU\_pair_{ijt} + \beta_{10} EU\_Host_{it} + \beta_{11} EEA_{ijt} \\ & + \varepsilon_{ijt}, \end{aligned} \tag{3.1}$$

where $lnFDI_{ijt}$ is the logarithm of bilateral FDI inflows to the host country *i* from origin country *j* at time *t*. β_0 is a constant term, $lnGDPHost_{it}$ and $GDPOrigin_{jt}$ are the logarithms of the GDP values of host and origin countries, respectively; $lndist_{ij}$ is the logarithm of bilateral distance (km) between capitals of countries *i* and *j; $comlangoff_{ij}$* denotes a dummy variable for the existence of a common official primary language between destination *i* and origin *j* countries; $colony_{ij}$ is a dummy variable capturing the presence of colonial relationships between countries *i* and *j; $smctry_{ij}$* is an indicator if countries *i* and *j* were or are the same country; ULC_{it} is the unit labor cost in the host country *i*; and ε_{ijt} is an error term.

The main relationship of interest is the impact of EU membership on FDI. Thus, we try to provide a full set of all possible effects. Besides the traditional dummy variable EU_pair_{ijt}, that takes a value of 1 if only both *i* and *j* countries are in the EU at time *t;* we further consider a dummy variable EU_memb_{ijt} that takes a value of 1 if origin country belonged to the EU at time *t* and the host country does not, or vice versa, and it is zero otherwise. We also added a binary variable, EU_Host_{it} that takes a value of 1 if the host country is in the EU and zero otherwise. To provide robustness, we include a binary variable, EEA_{ijt}, if both countries at time t are in the European Economic Area (EEA). The correlation between all EU dummies does not exceed 45%, and the test for multicollinearity is at the sufficient level of 1.73. Table 3.1 presents the outcomes.

We used various traditional and modern empirical techniques for estimating our model. Column (1) of Table 3.1 reports the baseline OLS results (Model 1), while Column (2) presents the extended OLS specification with remoteness indices (Model 2), both estimated with *lnFDI* as the dependent variable.

Most of the variables (GDP, distance, colony, similarity, and EU dummies) are statistically significant and have the signs that could be expected from the literature (Blonigen & Piger, 2014; Mistura & Roulet, 2019). Modern FDI activity is influenced by many important factors. FDI is generally proportional to the size of both the host and origin countries. Intuitively, larger economies are more attractive targets for FDI because of their market potential.

The elasticity of distance is −0.53. This is less than the value usually obtained for traditional trade gravity, which is between −0.7 and −1.5 (Yotov, Y. V., Piermartini, R., Monteiro, J. A., & Larch, M., 2016).

Table 3.1: Estimation Results of the Gravity Model for FDI

Model	(1)	(2)	(3)	(4)	(5)
Estimator	OLS1	OLS2	PPML1	PPML2	PPML3
Dependent variable	lnFDI	lnFDI	FDI=1 USD	FDI=0	FDI= .
			if FDI<0	if FDI<0	if FDI<0
lndist	-0.5340**	-0.7443**	-0.6137**	-0.6147**	-0.5483**
	(0.0802)	(0.2537)	(0.1792)	(0.1794)	(0.1747)
comlang_off	-0.5353	-0.3621	-2.5492**	-2.5462**	-2.6470**
	(0.3953)	(0.3936)	(0.3759)	(0.3765)	(0.3659)
colony	1.8270**	1.7922**	0.8108**	0.8104**	0.6787*
	(0.3684)	(0.4078)	(0.2851)	(0.2854)	(0.2813)
smctry	-0.3815	-0.3111	-0.1166	-0.1158	-0.0899
	(0.3731)	(0.3976)	(0.3588)	(0.3594)	(0.3528)
lnGDPHost	0.3354**	0.3464**	0.1767**	0.1767**	0.1877**
	(0.0467)	(0.0474)	(0.0250)	(0.0250)	(0.0260)
lnGDPOrigin	0.5504**	0.5467**	0.4716**	0.4724**	0.4458**
	(0.0553)	(0.0565)	(0.1208)	(0.1211)	(0.1150)
ULC	-0.0017	-0.0419	-0.2599	-0.2608	-0.2738
	(0.3946)	(0.3886)	(0.2750)	(0.2753)	(0.2624)
EU_memb	0.7661**	0.8245**	0.7172**	0.7175**	0.7517**
	(0.1815)	(0.1768)	(0.2591)	(0.2596)	(0.2519)
EU_pair	1.0777**	1.1420**	1.1682**	1.1713**	1.1046**
	(0.2602)	(0.2580)	(0.2920)	(0.2930)	(0.2869)
EU_Host	-0.0234	-0.1094	-0.1859	-0.1897	0.0716
	(0.2478)	(0.2425)	(0.2891)	(0.2900)	(0.2866)
EEA	-1.1824**	-1.1620**	-1.4416**	-1.4454**	-1.3083**
	(0.2650)	(0.2634)	(0.2753)	(0.2764)	(0.2833)
REM_Host		4.7585*	6.4298*	6.4387*	6.0701*
		(2.1758)	(2.8415)	(2.8455)	(2.7845)
REM_Orig		0.2634	0.0397	0.0394	0.0084
		(0.2699)	(0.2275)	(0.2278)	(0.2166)
_cons	-4.9067**	-44.4426*	-53.0595*	-53.1356*	-50.0844*
	(0.9587)	(18.0416)	(23.4770)	(23.5106)	(23.0111)
N	4016	4016	5346	5346	4469
r2	0.4610	0.4661	0.2400	0.2392	0.2779
RESET *p-value*	0.000	0.001	0.218	0.215	0.034

Source: Author's elaboration.
Note: Standard errors in parentheses + p < 0.10, * p < .05, ** p < .01.

In general terms, our findings confirm the gravity type of the model: FDI elasticity is positively related to the size of economy (GDP of the country) and is inversely related to investment frictions. In addition, the similarity in market size between EU countries encourages horizontal FDI. ULC was chosen as the proper measure of differences in relative factor endowments, rather than simple relative wage rates, since ULC also includes non-wage labor costs. A negative correlation between FDI and ULC is associated with vertical FDI. Because ULC is not statistically significant and higher trade and transaction costs between EU countries may discourage vertical FDI, the overall effect from the estimates is unclear.

EU_pair_{ijt} and EU_memb_{ijt} are statistically significant and positive but have a relatively higher coefficient than reported in the literature. Specifically, the average effect of EU membership on FDI is about 115%, calculated as (exp (0.766)-1)*100%, while the average level for this coefficient in the OLS model is 33% (Bruno et al. 2017). There are even more distinctive results for EU_Host_{it} and EEA_{ijt}, which show negative effects on FDI in the EU. These facts do not reflect reality and can be explained only by heteroskedasticity or inappropriate estimators. In this case, the OLS calculation does not consider pairs of countries with negative and zero FDI flows (more than 25% of the sample). Hence, it causes the misspecification of the model that is also confirmed by a RESET test (p = 0.000).

Consequently, the results clearly illustrate that the OLS estimator with log-linear transformations cannot be recommended for our purposes. In contrast, the best modern gravity practices recommend the PPML estimator as the preferred method in this case (Silva & Tenreyro, 2006; Yotov, Piermartini, Monteiro, & Larch, 2016). Because the dependent variable is expressed in levels, PPML also effectively handles the zero-FDI problem.

In addition to the estimation challenges, OLS1 results with high variability and unexpected negative effects on FDI may be due to the use of incorrect specifications, which could bias the results. Our first model does not include unobservable country-specific factors and the remoteness of the host country from others, the multilateral resistances (MRs) (Anderson & Wincoop, 2003).

The reason for including MRs in our FDI model (OLS2) is that remoteness is directly related to transportation costs. It is also closely related to transaction costs in terms of familiarity with local market conditions.

There are several ways to control for MRs. We started with the method that is frequently used today. By analogy with international trade, we created a model with remoteness indices, which are calculated as the logarithm of the country's average weighted bilateral distance where weights are the partner countries' shares of world GDP.

To show the importance of MRs for our specification, we tested different samples by various methods: first, the OLS estimator (Model 2) and then the PPML estimator (Models 3–5 of Table 3.1).

The results from the OLS2 model in Column 2 of Table 3.1 are mixed. Some of the coefficients are similar to those from Column 1, but the impact of distance is stronger, while the effects of $colony_{ij}$ are smaller. Because our host countries do not have a common official language with other countries in the sample, the coefficient $comlangoff_{ij}$ is negative. The estimates for *GDP of host* and *origin* countries as well as *EU* dummies are positive and statistically significant. The remoteness index of the host country (*REM_Host*), as expected, has a significant and positive effect on FDI, which means the nature of FDI is domestic market-oriented. In contrast, the coefficient of the remoteness index of the origin country (*REM_Orig*) is not significant, which does not suggest clear vertical FDI. This asymmetric effect allows us to identify a difference between FDI and trade gravity models. However, the limitations of observations and the insufficient level of the RESET test demonstrate the potential for biased results in the OLS2 model (Column 2). The more progressive PPML estimator (Models 3–5 of Table 3.1) was proposed instead.

The PPML1 estimates (Column 3) point to two main conclusions. First, more often, the PPML-estimated coefficient differences are remarkably smaller than those obtained with OLS. For instance, the coefficients of the host and source countries' GDP in this model (0.17 and 0.47, respectively) are not close to 1, as is generally believed in the OLS model. Moreover, OLS exaggerates the role of colonial history and geographical proximity (Silva & Tenreyro, 2006). For instance, in the OLS1 model (Column 1 of Table 3.1), the effect of colonial history on FDI in Europe is more than 500%, while in the PPML model it is more realistic at 125%. Similarly, the PPML-estimated coefficient of EU membership becomes smaller, indicating a more appropriate method. Second, the RESET test, in contrast to OLS models, provides no evidence of misspecification of the model ($p = 0.218$).

Regarding the MRs in all PPML models (Columns 3–5 of Table 3.1), the coefficients of the remoteness index of the host country (*REM_Host*) are positive and significant, while the remoteness index of the origin country (*REM_Orig*) is not significant and is much lower than in the OLS2 model. This is contrary to the traditional conclusion that *REM_Orig* has a negative effect on FDI inflows. In our case, this argument rests on transaction costs that are not at a high level. In line with the modern assumption by (Anderson, Larch & Yotov, 2019), we suggest that inward MRs are significant for FDI, while a negative effect of outward MRs on FDI is not pronounced. It could be that our sample supports the idea that more isolated countries from the rest of the world tend to get more FDI from the EU. Thus, there are no reasons for less FDI in the selected host countries, and our estimation results are theoretically consistent and not biased. The findings show that even with control for the MRs, OLS results are different from the PPML.

Besides the appropriate estimation techniques, the interpretation of estimates can also be distorted by the methods of building a sample. It is necessary to illustrate how bias arises via different approaches to handling negative FDI issues. In addition to extant studies, we compared three estimates of the sample obtained by the transformation of negative FDI flows into $1 (Column 3 in Table 3.1) with those generated by treating negatives as zero (Column 4) and those obtained by dropping negative values from the sample (Column 5). One thing to note is that the PPML-estimated coefficients of our baseline model (column 3) and estimates of transforming negative FDI into zero values (column 4) are remarkably similar. However, we cannot use the estimate because we have real zero country-pair FDI flows.

We identified a notable difference for the model with a positive subsample (Column 5). Here, first, the number of observations is smaller than in Column 3: 4,469 compared with 5,346. For a relatively small sample, this is a considerable difference. As a result, most standard gravity variables (distance and common language) and some EU dummies have a different effect. Second, a shrinking of the sample leads to an increase in R^2, suggesting a better fit of the empirical model. However, dropping more than 16% of our dataset significantly distorts the results, especially when combined with too many missing values in the earlier years of the analysis. Hence, comparing all possible methods, we empirically show the most preferred result — treating a negative value in FDI data as a very small constant, in our case, $1.

The estimation model was chosen due to this specific research interest. The key part of our analysis is related to MRs because they aggregate bilateral costs and FDI frictions for each country and represent the endogenous structural link between FDI and trade. Multinational resistance also captures the effects of EU membership on FDI flows and, more generally, investment liberalization between countries. However, the method of controlling for the multilateral resistances with remoteness indices is often criticized because it is theoretically inconsistent to capture only distance as FDI frictions (Bergstrand & Egger, 2007).

As an alternative estimation strategy, we employed potential improvements that have been proposed in the related literature, e.g., deriving the model with time-varying host- and origin-fixed effects or the model with time-invariant pair-fixed effects with time dummies (Bergstrand & Egger, 2007; Eicher, Helfman, & Lenkoski, 2011). More recently, Anderson *et al.* (2017, 2019) extended the earlier recommendations for trade gravity models and suggested combining time- and country-specific fixed effects. However, due to the novelty of this suggestion in the FDI literature, there is a lack of studies using this method. As appears from FDI research, using directional time fixed effects is problematic if the researcher is interested in the effects of country-specific variables due to collinearity (Mistura & Roulet, 2019). Consequently, the authors most commonly separate country-specific fixed effects from year fixed effects for estimating FDI models (Bergstrand & Egger, 2007; Bruno et al., 2017; Mistura & Roulet, 2019).

Given the complex objectives of our study and to follow modern methodology, we used both approaches as controls for MRs. First, we specified an FDI gravity model with host- and origin-country fixed effects that absorb observable and unobservable country-specific characteristics that vary across time (changes in national policies, institutions, exchange rates) and may influence bilateral FDI. We derived our second model by adding time dummies to control for macroeconomic shocks. To keep the two parts of our paper comparable, we initially tested our models with the OLS estimator, and later—to address the zero FDI problem and heteroskedasticity—we re-estimated our specification (3.2) using fixed effects and the preferred PPML estimator:

$$FDI_{ijt} = exp\,[\gamma_i + \upsilon_j + t + \beta_1 lndist_{ij} + \beta_2 comlangoff_{ij} + \beta_3 colony_{ij} + \beta_4 smctry_{ij} + \beta_5 EU\_memb_{ijt} + \beta_6 EU\_pair_{ijt} + \beta_7 EEA_{ijt}] * \varepsilon_{ijt}, \qquad (3.2)$$

Then, following the last recommendation, the gravity specification is modified with an appropriate set of host-time and origin-time fixed effects. Our next specification (3.3) with PPML is:

$$FDI_{ijt} = exp\,[(\gamma_{it} + \upsilon_{jt}) + t + \beta_1 lndist_{ij} + \beta_2 comlangoff_{ij} + \beta_3 colony_{ij} + \beta_4 smctry_{ij} + \beta_5 EU\_memb_{ijt} + \beta_6 EU\_pair_{ijt} + \beta_7 EEA_{ijt}] * \varepsilon_{ijt}, \qquad (3.3)$$

where FDI_{ijt} is the bilateral FDI inflows to the host country *i* from the origin country *j* at time *t;* γ_{it}encompasses the set of time-varying host-country fixed effects that account for the inward MRs (GDP, ULC) and any other country-specific characteristics. The term υ_j denotes the set of time-varying source-country fixed effects, which control for the outward MRs. The inclusion of time fixed effects, *t,* is a standard practice to control for aggregate shocks. In line with the new approach, we combine country fixed effects with time dummies$(\gamma_{it} + \upsilon_{jt})$. No constant term is included in the presence of the fixed effects. $lndist_{ij}$ $comlangoff_{ij}$, and $colony_{ij}$ denote standard gravity dummy variables; and ε_{ijt} is an error term. The dummies EU_memb_{ijt}, EU_pair_{ijt}, $and\ EEA_{ijt}$ are the same as in the specification (3.1). With the inclusion of the country-time fixed effects, we eliminate time-invariant country-specific variables to avoid the problem of collinearity.

The estimates for specifications 3.2–3.3 are reported in Table 3.2. As shown, the models include a full set of fixed effects: host-country (*Host_fe*), source-country (*Origin_fe*), and time effects (*Time_fe*) for OLSF models 1–2 and PPML models 4–5; host-time (*Host_time_fe*) and source-time effects (*Origin_time_fe*) for OLSF model 3 and PPML model 6. This enables a more comprehensive verification of MRs. The steady increase in R^2 across OLS and PPML models indicates results that are theoretically consistent with expectations.

Table 3.2: Panel data FDI model with fixed effects

Model	(1)	(2)	(3)	(4)	(5)	(6)
Estimator	OLSF1	OLSF2	OLSF3	PPML1	PPML2	PPML3
Dependent v.	lnFDI	lnFDI	lnFDI	FDI	FDI	FDI
lndist	-0.4930**	-0.5003**	-0.4957*	-0.5851*	-0.5820*	-0.5593**
	(0.1748)	(0.1750)	(0.1959)	(0.2318)	(0.2310)	(0.2116)
comlang_off	-0.9039	-0.5852	-0.4008	-2.9297**	-2.3453**	-0.2022
	(0.5556)	(0.5529)	(0.5745)	(0.7881)	(0.7848)	(0.6680)
colony	0.5706*	0.5659*	0.5093+	0.1884	0.1853	0.1743
	(0.2222)	(0.2239)	(0.2618)	(0.1544)	(0.1539)	(0.1388)
smctry	0.1706	0.1474	0.2752	1.0763**	1.0793**	1.1829**
	(0.3638)	(0.3643)	(0.3854)	(0.3276)	(0.3333)	(0.3524)
EU_memb	0.6555**	0.8687**	1.0690**	0.4160*	0.3527	0.6517*
	(0.1083)	(0.1801)	(0.2113)	(0.1929)	(0.2262)	(0.2664)
EU_pair	0.9507**	1.2782**	-4.7474**	0.9238**	0.9291**	-6.4578**
	(0.1413)	(0.2159)	(1.3198)	(0.1528)	(0.2584)	(0.4030)
EEA	-0.9201**	-0.8119**	-0.4351	-0.7391**	-0.6785**	-0.5699
	(0.1964)	(0.2081)	(0.2712)	(0.2313)	(0.2400)	(0.3551)
_cons	4.2821*	3.8844*	6.7089**	6.7510**	6.2461**	2.7054+
	(1.7445)	(1.7487)	(1.9344)	(2.1992)	(2.1966)	(1.4939)
N	4861	4861	4861	5346	5346	5340
r2	0.4073	0.4198	0.5738	0.4135	0.4434	0.6660
Host_fe*	Yes	Yes	No	Yes	Yes	No
Origin_fe*	Yes	Yes	No	Yes	Yes	No
Time_fe*	No	Yes	No	No	Yes	No
Host_time_fe*	No	No	Yes	No	No	Yes
Origin_time_fe*	No	No	Yes	No	No	Yes
RESET *(p-value)*	0.0001	0.0000	0.0000	0.0000	0.2698	0.2554

Source: Author's elaboration.
Note: Standard errors in parentheses + $p < 0.10$, * $p < .05$, ** $p < .01$.

Specifically, OLS models in Columns 1–2 and PPML models in Columns 4–5 fit the data relatively well; the explanatory variables account for almost 50% of the observed variation in FDI flows. However, the remarkable increase in R^2 when we add the country-time fixed effects (Columns 3 and 6) indicates improved model performance. It is also notable that PPML estimates provide a better fit to the data than the original OLS, even with fixed effects. For instance, R^2 for the PPML3 model (Column 6) is around 67%, while R2 for OLSF3 (Column 3) is 57%.
If we compare our R^2 with the results from other research in this area (Bergstrand & Egger, 2007; Bruno et al., 2017; Jirasavetakul & Rahman, 2018; Welfens & Baier, 2018), we can conclude that the R^2 of our OLSF models and PPML models are at a comparable level. On average, almost 70% of the variation in FDI flows in our model is explained by the specifications. In general, the results from Table 3.2 indicate sizable differences between OLS and PPML estimates in terms of coefficient magnitudes and statistical significance. To examine how estimation results change when different fixed effects are included, we start with the traditional gravity variables.

As expected, the variable distance is statistically significant and negative, with a relatively large magnitude in all models. Although the exact impact of distance on FDI is increasingly debated, the OLS results (Columns 1–3) and the PPML estimates (Columns 4–6) show that an increase in distance reduces FDI flows. We can interpret this as indicating that, for investors, greater distance—serving as a proxy for FDI frictions and transportation costs—has a stronger negative effect than market proximity.

The negative estimates of the common language variable in all models suggest that for FDI in our sample this factor has a less important role. Moreover, unlike OLS, the PPML estimates of common language become statistically insignificant when we include the country-time fixed effects (Column 6). These findings, as a proxy for cultural distance, are in line with papers about FDI activity in the CEECs (Borrmann, Jungnickel, & Keller, 2005; Jirasavetakul & Rahman, 2018).

Similarly, the PPML estimates of colonial history between selected countries, which are often overstated in OLS estimates (Columns 1–3), become statistically insignificant in the PPML models (Columns 4–6). This result is consistent with key papers on gravity models (Anderson & Wincoop, 2003; Silva & Tenreyro, 2006; Blonigen & Piger, 2014).

In contrast, the OLS models underestimate the effect of countries being the same (*smctry*). This variable is not significant under OLS but has a significant and positive effect on FDI under the PPML estimator, indicating that FDI is, on average, more than 180% higher (Columns 4–6).

All this confirms that the PPML results are consistent with real economic and political developments. Namely, Slovakia and the Czech Republic both belonged to the same country before 1993 (the former Czechoslovakia). Slovenia, Croatia, and Serbia were in the same country before 25 June 1991 (the former Yugoslavia). Estonia declared independence from the Soviet Union on August 20, 1991. The PPML model, by controlling for individual time- and country-specific effects (Columns 4–6), provides more accurate estimates than OLS (Columns 1–3). These factors have a direct and indirect impact on bilateral FDI inflows in the NMS.

Although OLS provides generally consistent estimates, the main coefficients (e.g., *GDP, distance, and colony*) are generally more stable and theoretically plausible across PPML models. Specification tests, such as RESET, further support the robustness of most of the PPML models (Tables 3.2–3.3). Moreover, PPML accounts for heteroskedasticity and zero flows, which are particularly important in gravity analyses, making its findings preferable for interpretation.

At the same time, both OLS and PPML techniques produce quite similar estimates of EU membership, implying a significant impact on FDI, but there are some inconsistencies. For instance, when we add country-time fixed effects, the binary variable *EU_pair* that indicates EU membership for both countries at time t becomes negative in both OLS (column 3) and PPML (column 6) models. At the same time, the variable *EU_memb,* which indicates EU membership for each country, shows a smaller magnitude and a weaker positive effect. When both host and origin economies belong to the *EEA* in the same year, there is no positive impact of the *EEA* on FDI inflows. In this case, the *EEA* variable is a de facto control group for our specification.

Estimates of the impact of EU membership on FDI flows are mixed, yet generally consistent with recent literature (Bevan & Estrin, 2004; Bruno et al., 2017; Welfens & Baier, 2018; Mistura & Roulet, 2019). In fact, there are small, negative coefficients of the variables *EU_memb* and *EU_pair,* which could be explained by several factors.

First, individual country-specific characteristics may be more powerful for FDI inflows to the NMS than bilateral variables in European integration.

Second, perhaps taking a dummy variable is not statistically sufficient to illustrate the results of the integration processes. Third, it is possible that since 2004 the NMS have also received FDI from outside the EU, for example, from the United States and China. In general, all these factors confirm the existence of the problem of endogeneity in EU integration, which requires a more detailed analysis.

3.3.2 Estimation of the Impact of EU Membership on FDI

Since the early 1990s, almost half of the European states have been included in the EU. While the debate on whether EU integration indeed promotes FDI growth is still ongoing, the objective of this analysis is to obtain estimates of the effects of EU membership on FDI in the new member states.

All existing studies estimate the effects of EU integration with an empirical gravity equation. We extended this literature in several aspects. First, we employed pair-fixed effects in our model. Most importantly, in addition to existing studies, we formulated and estimated one particularly robust specification: FDI modeling with a full set of fixed effects. Specifically, in order to obtain more reliable FDI estimates, we simultaneously used time-varying country fixed effects and time-invariant pair-fixed effects.

This is because the current approach of using simple country-specific or country-time fixed effects without pair-fixed effects in estimating the model of FDI generally does not address the potential endogeneity of EU integration.

The main point is that pair-fixed effects allow us to observe FDI flows from both before and after the official EU enlargement. Re-evaluating our FDI model, we apply the PPML estimator that also accounts for heteroskedasticity.

Second, along with bilateral determinants, we additionally try to separate effects of unilateral or country-specific determinants of FDI. Besides including country-specific variables (*GDP, ULC*), the unilateral effect is estimated by the introduction of the specific variables *EU_Host* and *EU_memb,* which represent only the one-sided EU membership.

There are numerous requirements, such as standards, intellectual property, and technical regulations, those investors must meet upon entering a country. These measures are not bilateral and, therefore, cannot be captured by a dyadic *EU_pair* dummy.

The major problem with the unilateral approach is that such variables would be perfectly collinear with a set of host-time and origin-time fixed effects.

Consequently, one of these unilateral variables should be eliminated from the model. For this, we start our analysis with a basic OLS model without country-specific fixed effects and at each additional step a new feature is introduced to the initial FDI specification.

Third, parallel to trade literature (Yotov, Piermartini, Monteiro, & Larch, 2016), besides the central idea, we assume that the impact of EU integration may not coincide exactly with the official EU enlargement. To capture the possibility that the effects of the EU continue over time, the model is further modified by including FDI lags.

Consistent with our argument, we started with a basic OLS specification without any indicators of EU integration and fixed effects (3.4):

$$lnFDI_{ijt} = \beta_0 + \beta_1 lnGDPHost_{it} + \beta_2 lnGDPOrigin_{jt} + \beta_3 lndist_{ij} + \beta_4 comlangoff_{ij} + \beta_5 colony_{ij} + \beta_6 smctry_{ij} + \beta_7 ULC_{it} + \varepsilon_{ijt}, \quad (3.4)$$

where the variables are identical to those in specification 3.1, except for the EU dummies. Then, we added a set of EU dummies and, most importantly, pair-fixed effects, and compared the models with each other. Thus, this operation allowed us to identify the main differences in FDI activity in the selected countries both before and after EU enlargement. To account for heteroskedasticity, we applied PPML for the empirical specification (3.5) of FDI levels with pair-fixed effects:

$$FDI_{ijt} = exp\,[\pi_{ij} + +\beta_1 lnGDPHost_{it} + \beta_2 GDPOrigin_{jt} + \beta_3 ULC_{it} + \beta_4 EU\_memb_{ijt} + \beta_5 EU\_host_{it} + \beta_6 EU\_pair_{ijt} + \beta_7 EEA_{ijt}] * \varepsilon_{ijt}, \quad (3.5)$$

where π_{ij} are pair-fixed effects, and the other variables are the same as variables in the previous specifications (3.2–3.3).

The main estimates of this approach are presented in Table 3.3. As seen in Table 3.3, Columns 1–3 are based on the OLS technique. Columns 4–7 estimate the same specifications with PPML.

As discussed earlier, all models in Table 3.3 were estimated without country-specific or country-time fixed effects. The specifications are divided into two groups according to the estimation method to compare the results within each group and then between groups.

Table 3.3: Effects of EU Membership on FDI Inflows

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	FES1 lnFDI	FES2 lnFDI	FES3 lnFDI	PPML1 FDI	PPML2 FDI	PPML3 FDI	PPML4 FDI
lndist	-0.6966**	-0.7443**		-0.5690**	-0.6137**		
	(0.2055)	(0.2537)		(0.1706)	(0.1792)		
comlang_off	-1.0794*	-0.3621		-3.5146**	-2.5492**		
	(0.4197)	(0.3936)		(0.4143)	(0.3759)		
colony	1.6262**	1.7922**		0.6728*	0.8108**		
	(0.4306)	(0.4078)		(0.3051)	(0.2851)		
smctry	-0.3259	-0.3111		-0.1346	-0.1166		
	(0.4112)	(0.3976)		(0.3767)	(0.3588)		
lnGDPHost	0.4537**	0.3464**	0.0276	0.1796**	0.1767**	0.0135	-0.0058
	(0.0521)	(0.0474)	(0.0230)	(0.0257)	(0.0250)	(0.0233)	(0.0263)
lnGDPOrigin	0.6435**	0.5467**	-0.0619	0.5519**	0.4716**	0.9968**	0.9014*
	(0.0545)	(0.0565)	(0.0966)	(0.1105)	(0.1208)	(0.2565)	(0.4329)
ULC	-0.0897	-0.0419	-0.1628	-0.3105	-0.2599*	-0.4421*	-0.3749*
	(0.4035)	(0.3886)	(0.4531)	(0.2829)	(0.2750)	(0.2123)	(0.3214)
REM_Host	5.1687*	4.7585*		8.2160*	6.4298*		
	(2.2225)	(2.1758)		(3.3393)	(2.8415)		
REM_Orig	-0.0826	0.2634		-0.3993*	0.0397		
	(0.2196)	(0.2699)		(0.1996)	(0.2275)		
EU_memb		0.8245**	0.6112**		0.7172**	0.3662+	0.1914
		(0.1768)	(0.2334)		(0.2591)	(0.2215)	(0.2164)
EU_Host		-0.1094	0.3409		-0.1859	-0.2493	4.0468**
		(0.2425)	(0.7019)		(0.2891)	(0.2663)	(0.9843)
EU_pair		1.1420**	1.3474**		1.1682**	0.9307**	0.8021**
		(0.2580)	(0.2591)		(0.2920)	(0.2421)	(0.2484)
EEA		-1.1620**	-0.8694**		-1.4416**	-0.6155**	-0.5612**
		(0.2634)	(0.2762)		(0.2753)	(0.1854)	(0.2046)
_cons	-47.1765*	-44.4426*	4.5644**	-64.8956*	-53.0595*	-10.6481**	-13.2790**
	(18.4653)	(18.0416)	(1.5868)	(27.4465)	(23.4770)	(2.3050)	(4.4558)
N	4016	4016	4016	5346	5346	5346	5346
r2	0.4104	0.4661	0.6986	0.1535	0.2393	0.4545	0.4856
Pair_fe*	No	No	Yes	No	No	Yes	Yes
Time_fe*	No	No	No	No	No	No	Yes
RESET	0.0000	0.0000	0.0000	0.1010	0.2180	0.3826	0.3376

Source: Author's elaboration.
Note: Standard errors in parentheses + p < 0.10, * p < .05, ** p < .01. Fixed effects are omitted for brevity.

To better understand how EU membership affects FDI inflows to the new EU members, we initially examined the differences between the estimates in Columns 1–2 and 4–5. The main results of this comparison show that the standard gravity variables (distance, colony) in the models with EU dummies are not statistically different from the corresponding estimated parameters based on the sample without the effect of *EU membership.* This confirms that bilateral variables do not vary much over time.

Additionally, the estimates of models 1–2 and 4–5 are similar to the findings reported in the previous chapter, which confirms the correctness of our analysis. However, as compared to the estimated coefficients associated with the OLS estimations (Columns 1–2), the PPML estimates (Columns 4–5) for *distance* are significantly smaller in absolute value. Similarly, the estimates of *common language* become statistically significant, and the estimate of *colony* decreases in magnitude but remains significant.

It is noteworthy that by adding EU dummies in models 2 and 5, we can observe an increase in R^2, and at the same time, there is a monotonic decrease of *GDP* coefficients. This supports the argument by Yotov et al. (2016) that the presence of mostly small countries leads to an overall increase in OLS and PPML estimates. In other words, smaller countries tend to be more dependent on FDI activity. In addition, the *GDP* coefficients of host countries are lower than the estimated *GDP* coefficients of origin countries. For our sample, this may suggest that FDI activity in the NMS is determined not only by a horizontal strategy, where FDI flows are larger from bigger EU economies, but also by vertical FDI factors.

Indeed, our estimates in Columns 5–7 highlight the importance of one more individual country characteristic: ULC. Remarkably, the impact of ULC in the OLS models (Columns 1–3) is not significant, while adding the EU integration variables in the PPML models (Columns 5–7) makes the estimates statistically significant with negative coefficients.

Intuitively, investors expect that the profitability of multinationals will be higher with lower labor costs in the new EU member countries. Thus, a negative *ULC* coefficient indicates increased FDI in the selected countries. Negative correlation between FDI and ULC is associated with vertical FDI. These findings are in line with recent papers (Cieslik, 2019; Jirasavetakul & Rahman, 2018). Hence, the inclusion of EU dummies and the use of the PPML estimator allowed us to improve the results and partially estimate the unilateral effect of EU integration in the selected countries.

The negative coefficients and the high magnitude of EU dummies (Columns 2 and 5) could be explained, as noted before, by the problem of endogeneity. To address this, we employed pair-fixed effects in subsequent OLS and PPML specifications (Columns 3 and 6–7 of Table 3.3). This minimizes the effects of all observable and unobservable time-invariant bilateral variables.

To avoid perfect collinearity, all bilateral gravity variables were dropped (Columns 3, 6, 7). Also, to control for global shocks and financial crises, we added year fixed effects, which are common for all countries (Column 7 of Table 3.3).

For all EU dummies, other than *EU_Host*, we find the effect of EU membership has been large and highly significant, increasing FDI inflows for both host and source countries by more than 100%. Meanwhile, by adding pair and year fixed effects to the PPML model of FDI (Column 7 of Table 3.3), the unilateral variable *EU_Host* becomes statistically significant, and R^2 in Column 7 doubled compared to R^2 in Column 3.

By contrast, the other unilateral coefficient of *EU_memb* now loses its previous significance in this PPML model. Empirically, only one unilateral variable in the estimation can express the impact of EU membership. Economically, the coefficients of *EU_pair* and *EU_Host* show that EU membership has led to larger and more intensive FDI activity between EU members. Even though our results are in line with recent studies (Gupta, 2017; Welfens & Baier, 2018), all selected countries are treated as one homogeneous group, and country-specific heterogeneity is ignored.

This is because it is difficult to find a suitable instrument for measuring the impact of EU membership on FDI, as the coefficients vary across countries and over time. To address this limitation, in our next estimation (Table 3.4), in addition to measuring country and pair-fixed effects (Columns 1, 4), we interact country fixed effects with time (Columns 2, 5). Then we estimated a model with the full set of fixed effects (Columns 3, 6).

As can be seen from the estimates in Columns 1 and 4, at least two EU dummies are positively related to FDI, whereas *EEA* has a negative coefficient. We used *EEA* as an aggregate measure that captures the average effect of all regional agreements. In general, it allows us to distinguish between the separate FDI effects of EU and non-EU agreement pairs. Nevertheless, the results ignore unobserved heterogeneity and time-varying country-specific variables (FDI regulation, trade policy, FDI activity under conditions of the world financial crisis, for example).

Next, the interaction of country-specific fixed effects with time (Columns 2 and 5) causes the positive and significant effects of *EU_memb* on FDI but negative effects of *EU_pair*. However, without including pair-fixed effects, the result could be distorted by endogeneity. Finally, we estimated the OLS and PPML models with the full fixed effects together (Columns 3 and 6). It was noted that the level of R^2 and the p-values of the Ramsey RESET indicate that the PPML specification (Column 6) is the most suitable for this purpose. Only PPML models satisfied the misspecification test. Based on this, we provide estimates of the PPML model in Column 6.

Once all fixed effects were introduced, we obtained a large, positive, and highly statistically significant estimate of the partial EU effect on FDI. Namely, the coefficient of *EU_memb* is 0.804, which is higher in magnitude than in Columns 1–5 and translates into a sizable FDI volume effect of 123% (*exp*(0.804) - 1 × 100%). We obtained the same result as Bruno et al. (2017), where the PPML coefficient of *EU membership* was 0.82, implying a positive FDI impact of 128%.

Table 3.4: Fixed-Effects Panel Estimate of EU Membership's Impact on FDI

Model	(1)	(2)	(3)	(4)	(5)	(6)
Dependent	FES1	FES2	FES3	PPML1	PPML2	PPML3
variable	lnFDI	lnFDI	lnFDI	FDI	FDI	FDI
EU_memb	0.6054**	1.0769**	0.6813*	0.2927	0.6517*	0.8040**
	(0.2268)	(0.2259)	(0.2695)	(0.2280)	(0.2664)	(0.3016)
EU_pair	1.3459**	-4.6318**	1.4409+	0.8779**	-6.4578**	-6.3532**
	(0.2576)	(0.5547)	(0.7949)	(0.2636)	(0.4030)	(0.3352)
EEA	-0.8621**	-0.3275	-0.0884	-0.6090**	-0.5699	0.0096
	(0.2757)	(0.2721)	(0.3127)	(0.2071)	(0.3551)	(0.2629)
lndist		-0.4880**			-0.5593**	
		(0.1630)			(0.2116)	
comlang_off		-0.3661			-0.2022	
		(0.5606)			(0.6680)	
colony		0.3114			0.1743	
		(0.3043)			(0.1388)	
smctry		0.1615			1.1829**	
		(0.3642)			(0.3524)	
_cons	2.5869**	6.7679**	0.0944	2.5462**	2.7054+	-9.4506**
	(0.1466)	(1.9182)	(1.3217)	(0.2787)	(1.4939)	(1.3617)
N	4016	4016	4016	5346	5340	5340
r2	0.6984	0.7557	0.8189	0.4808	0.6660	0.7426
Host_fe*	Yes	No	No	Yes	No	No
Origin_fe*	Yes	No	No	Yes	No	No
Time_fe*	Yes	No	No	Yes	No	No
Pair_fe*	Yes	No	Yes	Yes	No	Yes
Host_timefe*	No	Yes	Yes	No	Yes	Yes
Orig_timefe*	No	Yes	Yes	No	Yes	Yes
RESET	0.0000	0.0000	0.0639	0.1868	0.2554	0.2356

Source: Author's elaboration.
Note: Standard errors in parentheses + $p < 0.10$, * $p < .05$, ** $p < .01$. Fixed effects are omitted for brevity.

We found that, between 1991 and 2017, *EU membership* led to greater FDI inflows, on average, by about 23%. Meanwhile, the effect of *EU_pair* in our model (Column 6) is negative and 99% lower than expected under a typical scenario. Despite this strong precedent, the effect of *EU_pair* is statistically significant. Although the *EU_pair* coefficient might be expected to be positive in theory, the negative estimate in our results likely reflects sample limitations. The relatively small sample, combined with the inclusion of multiple types of fixed effects, may reduce the representativeness of the model and affect the magnitude of the coefficient. Nevertheless, the result remains statistically significant and aligns with the theoretical interpretation of simultaneous FDI creation and diversion effects within the EU.

Drawing an analogy with trade literature (Olivero & Yotov, 2012; Baier et al., 2019; Baldwin, Forslid, & Haaland, 1996), we suggest that a positive coefficient of *EU_memb* and a negative coefficient of *EU_pair* indicate two key impacts of EU integration. These are FDI creation and FDI diversion, which occur simultaneously in the EU. Also, for the old EU members, the lower transportation and production costs and reduced FDI frictions made FDI in the accession countries more attractive than investment in the rest of the world.

As seen in Column 6 of Table 3.4, despite a negative value, the coefficient of *EU_pair* is substantially larger than the effects of *EU_memb*. Thus, we can assume that FDI diversion effects are much stronger for the old European economies than FDI creation effects for the NMS. While the accession country gains 26 potential investors, the old EU country gains only one, i.e., FDI diversion is only partly offset by FDI creation effects. However, a negative sign of the coefficient of *EU_pair* can also indicate that EU membership is more strongly influenced by trade rather than FDI. Here, trade acts as a substitute for FDI and promotes a short-run strategy of horizontal FDI.

Besides, the effect of participation in the *EEA*—i.e., access to the *EEA* and single market—is negative and not significant. This confirms that the EEA agreement is also formed in the pursuit of other, non-FDI goals.

In general, our estimates of the effects of EU membership on FDI are comparable to those in the related literature. For example, Cardamone and Scoppola (2012) show that firms in the EU are mostly horizontally integrated, and the agreement may have a pronounced investment diversion effect. As in Bergstrand and Egger (2007) and Bruno et al. (2017), we obtained a similar impact of EU integration on FDI flows.

Meanwhile, FDI owing to EU enlargement was not a single event. Supposedly, the effect of EU integration on FDI may not occur simultaneously with official EU enlargement. From the analysis, FDI flows occurred both before and after decisions were made. This means that the impact of EU membership on FDI can be gradual. To evaluate this, we created a new FDI model with lagged variables.

Additionally, to examine whether FDI, in turn, affects EU membership via pair-fixed effects, we tested for possible "reverse causality." For this, we created a new variable capturing the future level of EU membership. While the use of lagged and lead variables has become popular in the trade literature (Baier et al., 2019; Yotov et al., 2016), it remains scarce in the FDI literature. We estimated phasing-in effects and future lead effects of the EU on FDI (Table 3.5) as a contribution to this literature.

Columns 1–3 report that partial effects of EU dummies are statistically significant, both for current and several lagged values of *EU_memb*. It is remarkable that the PPML coefficient *EU_memb* (β=0.82) indicates the same impact as in the previous specifications.

Most importantly, Columns 2–3 confirm that the EU integration process is phased in over time and affects FDI inflows with lags. Indeed, despite the fact that PPML estimates are usually larger than the OLS estimates, both indicate that lagged EU dummies are statistically significant and mostly positive.

Table 3.5: Phasing-In and Future Lead Effects of EU Integration on FDI

Model	(1)	(2)	(3)	(4)	(5)
Estimator	PPML_lead	OLS_lag	PPML_lag	OLS_glob	PPML_glob
Dependent variable	FDI	lnFDI	FDI	lnFDI	FDI
EU_memb	0.8062*	0.6945*	0.8242*	0.6693*	0.8031*
	(0.3205)	(0.3525)	(0.4212)	(0.2735)	(0.3231)
EU_pair	-6.3673**	-5.9258**	-6.3215**	-5.8921**	-6.4105**
	(0.3419)	(1.1452)	(0.3852)	(1.1263)	(0.3248)
EU_lead	-0.1226				
	(0.2914)				
EU_lag1		-2.3508	-3.2033**	-2.3805	-3.2541**
		(2.3398)	(1.0645)	(2.2196)	(1.0568)
EU_lag5		0.2178*	2.1296	0.1599	2.0699
		(1.1265)	(1.4879)	(1.0076)	(1.5690)
EU_lag10		-0.1257	1.3789*	-0.0901	1.2883*
		(0.9635)	(0.6125)	(0.9429)	(0.5280)
EU_lag12		-3.2151**	-3.7143**	-3.0860**	-3.5144**
		(0.7345)	(0.4132)	(0.6515)	(0.3535)
EU_lag15		-0.1044	0.8541	-0.0898	0.7954
		(0.9858)	(0.6321)	(0.8221)	(0.5409)
EU_lag20		-1.0585+	-0.3875	-0.9598+	-0.3372
		(0.6123)	(0.3928)	(0.5189)	(0.3327)
EU_lag24		-0.4258	1.1458+	-0.3765	0.9661+
		(0.8951)	(0.6259)	(0.8531)	(0.5357)
EU_lag27		-3.7541**	-2.3677**	-3.5025**	-2.2824**
		(0.9101)	(0.3925)	(0.8604)	(0.3664)
INTL_BRDR_1992				-29.3022**	3.1467**
				(7.8415)	(0.7614)
INTL_BRDR_1996				-1.2069	23.0526**
				(3.0955)	(2.7582)
INTL_BRDR_2000				-18.0611*	38.1202**
				(7.5977)	(3.8985)
INTL_BRDR_2008				-5.5944*	79.6457**
				(2.6079)	(8.2463)
INTL_BRDR_2012				-2.6863	87.3039**
				(2.0142)	(9.5208)
INTL_BRDR_2016				9.9605*	51.4084**
				(5.0040)	(4.9241)
_cons	66.9616**	-1.4393	-7.3344**	12.2014*	0.2548
	(5.4707)	(1.6404)	(2.5358)	(4.9742)	(0.7912)
N	5339	4839	5313	4839	5313
r2	0.7426	0.6024	0.7418	0.6418	0.7427
Total EU integration effect		-13.041**	-12.404**	-12.771**	-9.256**
		(2.0373)	(1.7439)	(2.704)	(1.279)

Source: Author's elaboration.
Note: Standard errors in parentheses + p < 0.10, * p < .05, ** p < .01. Fixed effects are omitted for brevity. Column (1) applies EU lead. Columns (2) and (3) present the phasing-in effects of EU enlargement, estimated using OLS and PPML, respectively.

These findings are consistent with results from related studies (Anderson et al., 2017; Bergstrand et al., 2015; Bruno et al., 2017), where the effects of integration agreements have remained significant for 10–15 years. As seen in Columns 2–3, the average effects of *EU_memb* more than doubled over 10 years (*EU_lag10*) after the Europe Agreement was signed. In the first 10 years, new EU members were attractive for FDI because they successfully combined access to a large single market and competitive locations, i.e., attracting horizontal FDI. However, these favorable determinants do not automatically translate to more FDI. In years 10–12, FDI inflows into NMS reached their peak and then decreased drastically compared to the previous years (Columns 2–3).

Due to the structure of FDI barriers, little liberalization occurred in the initial period, and most of the existing frictions were removed in subsequent periods. The NMS expected to catch up with the EU-15 in a short period, but they did not have enough capacity and potential, and hence required more FDI. Thus, investors increased their new efficiency-seeking (vertical) FDI in the accession countries.

Amid current global declines in investment, MNCs from outside the EU, mostly from East Asia, have started using accession countries for FDI as a regional export platform. FDI involves transfers of intangible assets such as know-how, brands, and patents, in addition to traditional forms of FDI. In this sense, FDI has become a key instrument of international policy. In general terms, the lagged coefficients of EU membership demonstrate a stable, long-term positive effect of the EU on FDI inflows, which reveals a new type of FDI, incorporating both horizontal and vertical FDI.

3.4 Conclusions and Policy Implications

In policy circles, FDI is viewed as a key driver of prosperity and development in the NMS. While many authors propose different explanations for the significant growth of FDI after EU enlargement, theoretically there are two main types of FDI activity identified in the literature: market-seeking (horizontal FDI), aimed at accessing a new market, and efficiency-seeking (vertical FDI), based on differences in relative factor endowments.

In addition to the existing literature, we argue that FDI in the EU, combined with international trade, creates deeper links between member and non-member economies. This occurs by stimulating technology transfers, fostering the exchange of know-how, implementing the KC model, and promoting export platform FDI. Policymakers in the EU can use the FDI determinants identified in this paper to support economic liberalization, for example by adjusting regulations on transport costs or establishing EU FDI screening mechanisms. The empirical analysis is based on the theoretical explanation of FDI determinants. To capture the patterns and reasons for FDI activity in the EU, we produced a gravity model for 39 countries between 1991 and 2017. To obtain reliable results, as an extension of FDI studies, we addressed the main challenges in the gravity estimates, namely zero and negative FDI flows, missing regions (MRs), and the endogeneity of EU membership. As a specific challenge in FDI estimation, we developed a method to handle negative FDI values in the sample.

Regarding the omission of zero flows, the results clearly illustrate that the OLS estimator with log-linear transformations cannot be recommended. As a solution, the PPML estimator is used with FDI in levels. For disinvestment, we compared three estimates obtained by transforming negative values into $1 USD, by treating negatives as zero, and by dropping negative values from the sample. Because the dependent variable is measured in millions, adding a completely arbitrary value ($1 USD) does not disturb the interpretation of the coefficients. This enabled us to contribute to the existing literature.

Given that the level of MRs is a general equilibrium indicator that captures the effects of FDI liberalization between any two countries, we used various techniques to control for it. First, we specified an FDI gravity model with host- and origin-country fixed effects that absorbed observable and unobservable country-specific characteristics that vary across time. Second, to adequately control for the dynamic forces, we combined country-specific fixed effects with time. Third, we added pair-fixed effects as a powerful tool to avoid endogeneity and control for all time-invariant bilateral costs. In the end, we tested a model with a full set of fixed effects using mixed OLS and PPML estimators.

The results obtained from the FDI gravity estimates have several future policy implications. For example, because labor cost has a significant effect on attracting FDI to the NMS, policymakers could lower wages to encourage more intensive vertical FDI in the country. However, gravity estimates show that many other factors also increase horizontal FDI. Specifically, FDI is positively correlated with GDP and negatively correlated with distance and FDI frictions. Richer countries are more attractive for FDI, but they also face higher expenditures and transportation costs. In this context, if a country is attempting to attract more FDI, it would be reasonable to focus on developing infrastructure, production capacity, institutions, and labor quality rather than merely reducing wages.

The impact of EU membership on FDI is the critical interest of this study. We found that between 1991 and 2017 EU membership led to greater FDI inflows, on average, by approximately 23%. Adding various EU dummies and using PPML allowed us to partially estimate the unilateral effect of EU membership. Two key results of EU integration—FDI creation and FDI diversion—occur in the EU simultaneously. By joining the EU, the new EU member countries received more FDI from the old EU members and less from non-EU member countries. Finally, we confirm that the impact of EU membership on FDI may not be instantaneous. The evidence of lagged effects reinforces our proposition regarding the impact of EU membership on FDI.

4 Trade and FDI connectivity in Europe: the European Union, Western Balkans and new EU candidate countries[2]

4.1 Introduction

Given the geopolitical risks and post-pandemic recovery in Europe, connectivity is acting as a driving force for greater European integration and more substantial foreign direct investment (FDI) and trade. With extensive global and regional connectivity links, Europe is the largest trade and investment partner of nearly every country. Before the crisis, the region was the destination for almost half of the global FDI flows. Over the period 2010-2020, Europe is the largest destination of FDI stocks in the world, accounting for more than one-third (35%) of all inward investment positions (World Investment Report (WIR), 2022).

Likewise, EU membership and participation in an Association Agreement (AA) with access to the common market allow European companies to become highly intertwined and make the EU a regional trade and FDI leader. Namely, the EU accounted for around 80% of all European FDI. Despite the decline in EU FDI inflows during 2019–2020, the European Union remains the leading source of FDI flows in Europe. Each year, the majority of FDI projects across the region are still undertaken by EU-based investors. The overall increase in FDI in Europe in 2021 was driven primarily by investment flows to the Western Balkans and several other non-EU economies (WIR, 2021; 2022).

Connectivity across Europe matters since the EU's economic and political influence in the region might depend on how strong its trade and investment ties become. The old EU member states (France, the Netherlands, and Germany) are generally net investors while the new EU member states (Poland, Hungary, and Romania), the candidate countries and new EU applicants (the Western Balkans, Turkey, Ukraine, Moldova, and Georgia) are generally net recipients of intra-European FDI. In any case, intra-European FDI activities benefit Europe: both the host region (as FDI inflows) and the home region (as FDI outflows).

Extra-European FDI flows mainly benefit a home country through access to new markets and enhancing connectivity. Until 2009, there was a clear tendency for extra-European FDI toward EU-15 countries: Germany, the UK, France, Italy, and Spain accounted for almost 60% of total extra-European FDI. Since the 2010s, the Western Balkans and later some other non-EU economies (Ukraine, Moldova, and Georgia) have been covered by the Association Agreement (AA) with trade and FDI preferences that pushed its connectivity partnerships with European and non-European investors. Over the last

[2] This chapter reproduces the author's previously published work: Dorakh, A. (2022). *Trade and FDI connectivity in Europe: The European Union, Western Balkans and new EU candidate countries*. *Eastern Journal of European Studies, 13*(2), 24–53. https://doi.org/10.47743/ejes-2022-0202

eight years, as the EU's trade and FDI involvement in the region declined, Chinese investment increased and doubled in some European countries (Kratz *et al*., 2021).

Despite the largest share of non-European FDI towards Europe in 2020 originating in the United States (US) (European Commission Report, 2021), we examine European connectivity, focusing on China for several reasons. China was among the EU's top three trading partners in goods in both 2020 and 2021, serving as the EU's leading import partner and a major export market (UN Comtrade, 2022). China is still a provider of infrastructure connectivity projects and one of the largest investment sources for most European countries. In addition, Chinese investments cover all regions of Europe: EU member states, the Western Balkans, and Eastern European countries outside the EU have become preferred destinations.

Second, the relations between China and the European Union (EU) are undergoing the most pronounced changes. The new phase of EU-China connectivity over 2019-2020, in turn, has reduced Chinese FDI in the EU and the UK to its lowest value since 2010 (European Commission Report, 2021). Third, while European connectivity stimulates FDI flows from outside investors, recent concerns about Chinese investment and reinforcing trade barriers might have the opposite effect, increasing incentives for intra-regional FDI that might be a policy issue. It also provides security for those EU members and candidates that do not have the FDI screening or regulation mechanisms.

For the new EU candidates and applicants (Ukraine, Moldova, and Georgia), the EU is the largest trade and FDI partner, accounting for 52% of the total trade for Moldova, 39% for Ukraine, and 22% for Georgia in 2020. Before the war, Ukraine hosted more than 60% of EU outward FDI stocks in the region. The war is expected to consolidate these connections (Ruta, 2022), and the EU accession might be a driver of its modernization and policy stabilization.

European connectivity, therefore, holds the potential to enhance economic growth through trade and FDI for each country. In this paper, we demonstrate that connectivity should not be seen as a country-level factor, but as a regional and sub-regional determinant of FDI within and outside Europe.

From the initial analysis in this paper, we verified that connectivity has sharply increased the prospects of European integration which, in turn, has facilitated both trade and FDI in the region. However, the literature about connectivity as an indicator of economic cooperation or its effects on trade and FDI is more ambiguous. While most trade models include trade cost as an empirical determinant, in the FDI models, trade and investment costs are typically not examined.

This study contributes to the existing literature in terms of three main issues. First, we suggest a variable linked to European integration, trade costs, and FDI. In a broad sense, we employ connectivity as a moderating policy variable of economic integration expressed through trade and FDI within and between European (focusing on the EU) and non-European partners (focusing on China). To quantify connectivity for our purposes, we calculate a trade cost index incorporating FDI restrictiveness, based on observable trade data for each country and its partners in our sample and adapted following Novy (2013), to capture bilateral trade costs affecting FDI flows.

Second, to investigate the effects of connectivity on FDI inflows in Europe, we extend the existing FDI estimation models by including, in addition to the physical (Arvis and Shepherd, 2011) and digital (Adedoyin et al., 2020) infrastructure proxies, the calculated trade cost indices. This approach allows us to assess whether foreign direct investment in Europe is more strongly influenced by intra-European or extra-European connectivity and to differentiate its effects across the EU, the Western Balkans, and new EU candidate and applicant countries (Ukraine, Moldova, and Georgia).

Third, we further argue that it is also equally necessary to verify among country-specific FDI determinants the country's uncertainty and FDI policy factors. Thus, we use the interaction terms between the host country and integration dummy variable to capture how the effect of policy stability influenced FDI inflows across Europe. In addition, as an empirical contribution, this paper uses a new difference Generalised Method of Moments (GMM) estimator of a linear dynamic panel-data model introduced by Kripfganz (2020). Besides traditional estimators, the results are obtained by applying the most recently available various econometric tools, i.e. cross-sectional dependence test, the second-generation unit root tests, cointegration test, and the causality test between FDI and GDP per capita.

The remainder of this paper is organized as follows. Section 2 reviews the literature on the effects of economic, political, and institutional factors on FDI. Section 3 describes the methodology for calculating trade cost indices and discusses the role of trade costs in determining FDI. Section 4 presents the empirical analysis of the FDI determinants in Europe. Section 5 presents the empirical results, comparing across data sets and different model specifications. Section 6 concludes the study with the main findings and implications.

4.2 Literature review

Reducing trade costs is a key instrument for increasing connectivity and integration among countries, which in turn facilitates trade (Buchan *et al.,* 2012) and enhances FDI attractiveness (Gould *et al.,* 2021). While many studies investigate the link between connectivity and aggregate trade flows (Vidya *et al*., 2020) or visualize it through infrastructure projects (Palit, 2019; Vidya and Taghizadeh-Hesary, 2021), the relationship between connectivity and the national FDI flows has not been widely covered.

Connectivity, including trade costs, is associated with both trade and investment across European borders and, thus, might encourage or impede economic integration. Discussions about European integration instead focus on trade effects of European Union (EU) membership, though the potential impact on FDI has also been recognized (Bruno *et al*., 2020; Hunady and Orviska, 2014; Welfens and Baier, 2018). For measuring the degree of European integration, authors mainly use dummies to capture the impact of EU membership or other forms of integration. In this context, the paper investigates how EU membership and Association Agreement (AA), as proxies of connectivity, affect FDI. However, these indirect measures assume that the impact for all countries is the same. So, in addition to the dummies, a direct measure that also reflects investment restrictiveness and trade barriers might be more appropriate.

Since variations in trade costs lead to changes in FDI (Anderson *et al*., 2019; Derudder *et al*., 2018), in this paper, we explore the impact of connectivity on FDI through trade costs with FDI restrictiveness. Carr, Markusen and Maskus (2001) suggest the need to include distance, trade and investment costs as separate determinants of FDI.

In the empirical literature, the importance of trade costs in determining the pattern of FDI is suggested by the gravity approach (Bruno *et al*., 2020; Kox and Rojas-Romagosa, 2019), and geographical distance is used as a proxy for trade costs. Although trade and FDI patterns show clear gravity characteristics, in this model, individual country factors are usually hidden in the fixed effects and not allowed to see the impact of country-specific determinants. Moreover, it is hard to explain policy changes in FDI. At a time when there is no change in the distance between countries, connectivity, which implies trade, transport, and investment costs, might be the most influential factor factor for the FDI activity (Chen and Lin, 2018; Gould *et al*., 2021).

Cardamone and Scoppola (2012) assess the impact of trade costs on FDI in the EU but, contrary to our aim, examined the outward stocks of FDI. While a considerable amount of research has examined the impact of trade policy on FDI patterns, studies focusing on Europe as a whole are limited and have primarily concentrated on intra-European FDI, whereas our analysis considers both intra- and extra-European flows.

This study examines FDI patterns and their determinants in European countries, including economic interactions with countries outside the EU. In addition to the EU core, we analyze new EU members, considering their FDI connections not only within Europe but also with countries in Asia, notably China. Moreover, for the first time, we develop an FDI model covering all countries involved in the EU accession process, including new EU candidates and applicants (Ukraine, Moldova, and Georgia).

The recent papers verify the relationship between trade position and FDI in the EU and the Western Balkans (Ercegovac *et al*., 2022) or investigate the impact of European integration on capital flows to prospective EU member states (Jirasavetakul and

Rahman, 2018; Kaya and Haan, 2022). However, we estimate the impact on FDI for a much wider range of countries and over a much longer time period than those used in previous studies.

Theoretical models suggest that enhancing connectivity as a factor in promoting FDI typically requires low trade costs to be maintained between the partners (Duval and Utoktham, 2014). Trade theory suggests a negative relationship between trade costs and value of trade, but not with FDI.

The Knowledge-Capital model of FDI (Markusen, 2002; Bergstrand and Egger, 2007) highlights that trade costs affect FDI differently depending on its nature. Specifically, trade costs are expected to positively influence horizontal FDI while having a negative impact on vertical FDI. More recent international trade models suggest that some FDI inflows may not fit neatly into horizontal or vertical categories, as in the case of export-platform FDI (Ekholm et al., 2007). Moreover, when examining aggregate FDI flows, it is difficult to distinguish between different FDI types and to isolate the specific impact of trade costs on each type.

While the literature provides a wide range of FDI determinants, such as economic size and growth (Bevan and Estrin, 2004; Blonigen and Piger, 2014); openness to trade (Asiedu, 2002; 2006); infrastructure development (Canh *et al*., 2020), and a regulation or institutional quality (Kaushal, 2021); connectivity, which is intrinsically related to FDI, is not examined. Some studies, namely Bakar *et al*. (2012), Bailey (2018), and Palit (2019), have pointed out that FDI attractiveness and trade activity are heavily influenced by geopolitics and regional prospects but do not consider the country's ability to connect with partners, whereas connectivity, investment regulation and trade barriers are important components of trade costs (Arvis *et al*., 2016).

A focus only on the direct impacts of connectivity on FDI and trade in Europe often misses some of the wider effects. For instance, Chen and Lin (2011) demonstrated that Chinese FDI in Europe was closely linked to improvements in infrastructure and connectivity, meaning that Chinese investment often accompanied these enhancements, which is consistent with the patterns observed in our analysis.

One of the most salient features of the international economy has been the rise of digital infrastructure with information and communication technology (ICT) being a key determinant of FDI (Adedoyin *et al*., 2020). Samina *et al*. (2019) investigate the impact of institutional quality and political stability on FDI inflows.

This paper contributes to the literature by verifying and expanding the range of FDI determinants and constructing an estimated FDI model with connectivity as an explanatory factor for the pattern of FDI and as an indicator of European integration.

4.3. Connectivity as a determinant of FDI and trade in Europe

4.3.1 Measuring connectivity via international trade costs

Despite the fact that trade costs, as a proxy for connectivity between countries and regions, play a key role in international trade, investment, and European integration, quantitative estimates of these determinants have been limited. Drawing on the international trade literature, we measure connectivity through international trade costs. This measure encompasses trading costs, transaction costs, trade policy barriers, costs of complying with foreign regulations, communication costs, and transport costs, all of which contribute to trade and FDI connectivity. Broadly, trade costs represent all additional expenses involved in bilateral trade relative to domestic trade. This approach gives rise to a bilateral gravity equation of international trade (Anderson and van Wincoop, 2004; Novy, 2013; Duval and Utoktham, 2014).

To assess the impact of connectivity, specifically trade costs, on FDI patterns in Europe, we first calculate trade costs and then include our derived indices in the empirical model. Following the standard gravity equation approach of Novy (2013), we compute trade cost indices from the observed trade patterns between the sample countries. Intuitively, if a country trades more domestically, its average international trade costs are higher and its level of connectivity is lower.

To calculate trade costs and subsequently examine their impact on FDI inflows in Europe, we construct two separate datasets for trade flows and FDI inflows. First, we use a comprehensive bilateral dataset of aggregate annual trade flows between 39 European and non-European countries, covering most European trade from 2000 to 2020. To facilitate analysis at the subregional level, we also identify various country groups. Second, we compile a dataset of unilateral FDI inflows in Europe to assess trade costs as a determinant of FDI.

The total bilateral trade costs are calculated based on the Novy (2013) inverse-gravity method (Equation 4.1):

$$t_{ij} = \left(\frac{X_{ii}X_{jj}}{X_{ij}X_{ji}}\right)^{\frac{1}{2(\sigma-1)}} - 1, \tag{4.1}$$

where

- t_{ij} denotes geometric average trade costs between country i and country j
- X_{ij} denotes international trade flows from country i to country j
- X_{ji} denotes international trade flows from country j to country i
- X_{ii} denotes intranational trade of country i

- X_{jj} denotes intranational trade of country j
- σ denotes elasticity of substitution.

According to Equation (4.1), trade costs show how much more expensive bilateral trade is relative to domestic (intranational) trade. The value of intranational trade is defined as GDP minus exports since gross output data is not available for most EU candidate countries and new EU applicants.

Bilateral international trade (export) flows from 2000-2020 are obtained from the UN Commodity trade database (UN Comtrade). GDP and gross exports, which are used in the calculation of bilateral intranational trade, are obtained from World Development Indicators (WDI). Following past literature (Novy, 2013), elasticity of substitution is assumed to be constant over time and set at σ = 8.

Based on Equation 4.1, we first compute trade costs for each of the 38 European countries with respect to European and non-European trade partners over the period 2000-2020. European countries here include all EU members, the Western Balkan countries, Ukraine, Moldova, and Georgia. As a special case, Turkey is also included since the country is recognized as an EU candidate and located in both Asia and Europe. As a European partner, we present the European Union. As a non-European partner, China was among the EU's top three trading partners in goods in 2020 (UN Comtrade, 2022).

For this, three groups of countries are formed based on the process of joining or membership of the EU: the group of EU members, EU candidates and potential candidates, and the new EU candidates and applicants. Namely, the EU group (*EU*) consists of all 27 (28) EU member states; the group of EU candidates and potential candidates (*WB*) includes Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia; and the new EU candidates and applicants (*NEW_APPL*) group includes Ukraine, Moldova, and Georgia.

Following Equation (4.1), average trade costs are computed for all subregions (groups). Subregional trade costs are calculated as the simple averages of bilateral trade costs between countries within each subregion (the EU, the Western Balkans, and the new EU candidates and applicants).

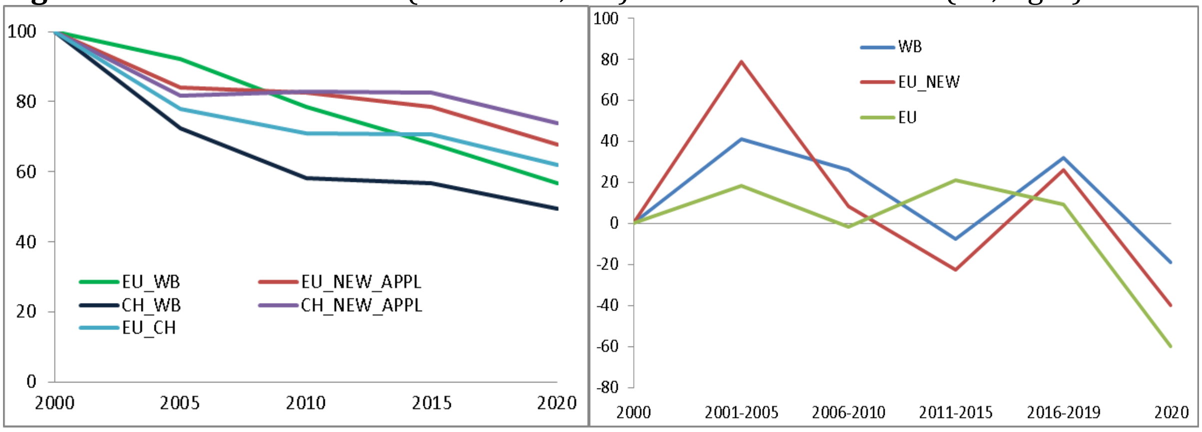
Finally, to examine the impact of connectivity on FDI, we calculate trade costs between subregions and their European (EU) and non-European partners (e.g., China), using the average aggregate trade costs of subregions over various years. As a result, we obtain two series of trade cost indices:

- individual average trade costs for each country in the sample with its trade partners;
- average aggregate trade costs within and between subregions.

4.3.2 The Patterns of FDI and the Role of Trade Costs

The effectiveness of connectivity as an indicator of European integration and as a determinant of trade and FDI can be assessed by comparing trade cost indices with FDI growth rates across Europe over time. Since the computed trade cost indices are not directly comparable in levels across years, they are normalized to 100 in the year 2000. The resulting series are presented in Figure 4.1.

Figure 4.1: Trade Cost Index (2000=100, left) and FDI Growth Rates (% , right)



Source: trade costs calculated based on the paper by Novy (2013), growth rates of FDI calculated based on the World investment report (2022).

Figure 4.1 (left panel) shows that overall trade costs in Europe declined between 2000 and 2020. The most pronounced reduction in average international trade costs, relative to domestic trade, occurred for the EU candidate countries (*Western Balkans*) with both European (*EU*) and non-European (*China*) partners. Trade costs decreased by about 45 percent for EU partners (*EU_WB*) and roughly 50 percent for China (*CH_WB*).

It can be noted that most of the decline in trade costs between the Western Balkans and the EU occurred between 2005 and 2010. This period coincided with EU membership applications from North Macedonia (submitted in 2004), Montenegro (2008), Albania (2009), and Serbia (2009). In 2005, Bosnia and Herzegovina, followed later by Kosovo, began EU Stabilization and Association negotiations for future membership. Importantly, enhanced connectivity and reduced trade costs appear to have progressed in tandem with regional integration and multilateral trade and investment agreements.

Trade costs between the Western Balkans and China declined faster than those between the Western Balkans and the EU until 2016; thereafter, the two series moved in parallel. This pattern may reflect diminishing benefits of lower trade costs over time, shifts in trade within Europe due to the EU candidate or potential candidate status, or changes in the regulation of Chinese trade and FDI inflows. Overall, the substantial drop in trade costs between the Western Balkans and the EU (−45%) over the period 2000–2020 indicates a high level of integration within Europe.

In addition, the decline in trade costs between the EU and China (−35%) over the same period points to increasing integration with non-EU partners. This finding is consistent with previous studies (Beltramo, 2010), which reported an average 32% reduction in trade costs between the EU and a major non-European trading partner (China).

However, as seen in Figure 4.1 (left panel), the decline in trade costs between China and the EU slowed during 2019–2020, most likely due to changes in EU international policy, including increased trade barriers and the introduction of an FDI screening mechanism.

While the average trade costs between the new EU candidates and applicants (Ukraine, Moldova, Georgia) and the developed countries (the EU) and non-European partners (China) consistently declined throughout the entire period (-32% and -25%, respectively), they still exceed the costs of trade in the Western Balkans. Since 2016, when the countries began to implement AA, trade costs of the new EU candidates and applicants have fallen significantly. Moreover, trade costs with the EU are found to have fallen faster than with China during the period considered.

After examining indices and trends in trade costs for selected countries, we intend to underscore that the trade cost measure is economically sensible as a determinant of FDI and a proxy for the European integration level. For this, we investigate patterns of FDI in Europe as a whole (Figure 4.1, right panel) and compare the growth in FDI between three European subregions, including the European Union (EU), the Western Balkans (WB), and the new EU candidates and applicants (Ukraine, Moldova, and Georgia).

Figure 4.1 (right panel) shows that total FDI in Europe increased between 2000 and 2010 following EU enlargement in 2004 and despite falling in 2009 due to the global financial crisis. However, the growth rate of FDI in the EU was lower than the growth rate of FDI in the Western Balkans (WB) and the new EU candidates (EU_NEW) over the period 2005-2010. One reason for this is that with reducing trade costs (Figure 4.1, left panel), investment into the EU from non-EU countries was lower than the EU outward investment in those countries.

Between 2011 and 2016, there was a low recovery of the growth in EU direct investments, reaching a peak of 22% in 2015, which was attributed to large global mergers. With a decline over the period 2017-2019, due to a change in US tax policy, Brexit, and the sharpest reduction of Chinese investments into Europe, FDI flows dynamics in the EU have been rather weak. In 2020, not only the pandemic but also trade restrictions and FDI screening regimes reduced FDI in the EU.

The growth rates for FDI in the Western Balkans from the first half of the 2000s, when the countries applied for EU membership, became higher than for the EU countries. In the period 2005-2010, inward FDI was lifted by growing cooperation with the EU (WIR, 2020). Despite the majority of inflows in the 2010s coming from the EU developed countries, Chinese investment in the sub-region doubled. As trade costs are reduced

sharply (Figure 4.1, left panel), China is becoming the fourth largest source country in transition economies (WIR, 2020). In the 2018-2019 period, the region received a relatively higher level of foreign investment than in previous years since investor interest shifted towards the Western Balkans, which was close to catching up with some EU members in terms of economic growth. Of all the subregions, the Western Balkans was the area where FDI was least impacted by the pandemic in 2020. This effect is likely to be related to the resilience of EU integration, which appears to promote investment programs in the region (WIR, 2021).
Since the 2000s, Ukraine, Moldova, and Georgia have become immediate neighbours of the EU, increasing growth rates for FDI in the sub-region. The EU enlargement of 2004 created key connective and logistical advantages for these countries. In the 2011-2015 period, following the financial crisis and the geopolitical conflict in Ukraine, FDI flows to the sub-region declined by 27%, the lowest level since 2000. Despite the difficult business environment in Ukraine over 2016-2019, a project finance agreement was signed with Chinese investors (WIR, 2021). Besides the pandemic, the reduced growth rates for FDI from 2020 are likely to be a result of the geopolitical risk, trade tensions, and the more protectionist FDI policy, since the EU adopted an FDI screening regulation for non-EU countries. Indeed, it is in line with the trend of slowly reducing or even increasing trade costs in the region (Figure 4.1, left panel).
As shown in Figure 4.1, while trade costs between countries gradually decrease over time (left panel), FDI inflows for all countries in the sample generally increase (right panel) throughout the period. This suggests a positive relationship between connectivity and FDI. The role of trade costs in shaping FDI patterns is supported both by theoretical models and by the observed FDI dynamics in the selected countries.

4.4 Panel data analysis of the FDI determinants in Europe

4.4.1 Model specification and Data

The links between trade costs and flows of trade and FDI constitute a key research question: reduced trade costs are likely to promote trade (Anderson and van Wincoop, 2004; Arvis *et al.*, 2016) and FDI (Duval and Utoktham, 2014) in the region. Consequently, European integration forms and treaties (the EU, Association Agreements), linked to lower bilateral trade costs, might also encourage FDI growth (Bruno *et al.*, 2020; Beltramo, 2010). Thus, the hypothesis is that with progressively reduced trade costs, more FDI is likely to be attracted to the region and European integration is enhanced, unlike when connectivity is limited.
Once trade costs for different countries and subregions and their European and non-European trade partners are computed, the existing FDI estimated models are extended

by adding, among other variables, the resulting indices as an explanatory variable. We verify connectivity among the economic and institutional factors affecting FDI and create an empirical model to investigate the impact of connectivity on FDI flows in Europe over the period 2000-2020.

This paper uses an unbalanced panel dataset of annual FDI inflows for 38 European countries from 2000 to 2020. The novelty of our approach lies in the inclusion of all countries that currently have, or are expected to receive, EU membership. The sample comprises all EU member states; following the United Kingdom's exit from the EU on 31 January 2020, the dataset has been updated to include 27 member states instead of 28. The Western Balkans and Turkey, as EU candidate and potential candidate countries, are also included. For the first time in the EU context, the sample additionally incorporates Ukraine, Moldova, and Georgia as new EU candidates and applicants. The sample and time period were selected based on the availability of recent data.

Until 2022, Ukraine and Moldova have not yet been granted EU candidate status but have signed an Association Agreement (*EU_AA*) as priority partners for the European Union. Georgia recently applied for the EU and formally signed the Association Agreement in 2014.

Based on the literature, we suggest the following baseline model (4.2):

$$\begin{aligned} ln\_FDI_{it} = {} & \beta_1 ln\_GDP\_PC_{it} + \beta_2 t_{it} + \beta_3 EU_{it} + \beta_4 EU\_AA_{it} \\ & + \beta_5 ln\_OFDI\_CH_{it} + \beta_6 Policy\_stab_{it} + \beta_7 ln\_IT_{it} \\ & + \beta_8 ln\_Internet_{it} + u_{it} \end{aligned} \tag{4.2}$$

where ln_FDI_{it} is the logarithm of FDI inflows to country *i* at time *t*, $ln\_GDP\_PC_{it}$, t_{it}, EU_{it}, EU_AA_{it}, $ln\_OFDI\_CH_{it}$, $Policy\_stab_{it}$, ln_IT_{it}, $ln\_Internet_{it}$ are the explanatory variables, and u_{it} is the composite error term, comprising fixed effects and an idiosyncratic error component. The dataset spans the period 2000–2020 (T=21) and includes 38 countries (N=38), with an unbalanced panel structure due to some missing observations in certain years.

As a dependent variable, we use FDI inflows, which is the *net inflow of FDI* expressed in millions of U.S. dollars. To enable comparisons over time, FDI inflows are deflated using each country's domestic GDP deflator. We focus on FDI flows rather than FDI stocks because stocks represent accumulated past flows and are static, whereas flows capture current transactions occurring in a given year *t* and reflect dynamic investment activity.

FDI flows are used rather than stocks also because the other series in the analysis (*Chinese FDI outflows, IT*) are flow variables. The FDI variable is transformed using the natural logarithm to reduce potential heterogeneity. Zero values account for only around 6% of the total observations.

As independent variables, in addition to trade costs, we include country-level macroeconomic and institutional factors that have been identified in the empirical literature as determinants of FDI. Details on the definitions, calculation methods, and data sources for both dependent and independent variables are provided in Appendix B (Table B1).

Traditionally, Gross Domestic Product (GDP) is defined as the most comprehensive FDI determinant, measuring the country's economic output. Moreover, for countries with different levels of income, as in our sample, GDP per capita is often included (Bruno *et al*., 2020). The GDP per capita *($ln\_GDP\_PC_{it}$)* can be considered a rough indicator of a country's economic development. For investors, it also serves as a proxy for the purchasing power of citizens in a given country. Consistent with FDI inflows, we use the logarithm of GDP per capita *($ln\_GDP\_PC_{it}$)* in the analysis. Likewise, GDP per capita values are deflated using each country's domestic GDP deflator. Real GDP per capita removes the effects of inflation and provides a more accurate measure of living standards across countries.

In addition to previous studies, we examine the impact of EU integration on FDI inflows for all countries that, at some point, are considered as one EU member, a candidate, or new applicants. To this end, FDI inflows in Europe are regressed on EU membership dummy (*EU*) and the European Union Association Agreement dummy (*EU_AA*) for non-EU countries, which allows estimating the effects of the EU accession preparation process. The variable EU_{it} is a dummy that captures the effect of EU membership of country *i* (equals 1 if a country is an EU member at time *t*, 0 otherwise).

The effects of Association Agreements (AA) here consider the agreements between the EU and EU candidates and applicants that provide potential EU membership. The variable EU_AA_{it} captures the agreements that have been recently signed between the EU and non-EU countries, namely, the Western Balkans, and the new EU candidates and applicants (Ukraine, Moldova, Georgia). The Association Agreement between the EU and Turkey (the Ankara Agreement) is also included. European Agreements that the countries, now EU members, had before their own EU accession are not covered. So, the coefficients of dummies examine the current effect of EU candidacy status on FDI. The variable EU_AA_{it} equals 1 if AA in a country *i* enters into force at time *t*, and 0 otherwise.

Our primary variable of interest is trade costs (t_{it}). In Model (4.2), the variable t_{ij} is an index of individual average trade costs between each country in the sample and all their partners, namely, the total value of trade costs to the rest of the world. The individual index shows whether the impact of EU integration on FDI inflows works through improved connectivity in the host country.

To examine whether trade costs are related to intra-European or non-European flows, it is necessary to disaggregate the indices at the sub-regional level. As China is one of the most influential trade and investment partners in Europe, we include in the model a variable for China's FDI net outflows (*$ln\_OFDI\_CH_{it}$*) in logarithmic form. Alongside the trade-cost effects, this allows us to assess the potential role of China in shaping the patterns of FDI in both EU member states and EU candidate and applicant countries. In addition, it should be noted that China mainly invests in infrastructure and the information and communication technology (*ICT*) sector in Europe.

The study focuses on the export of ICT goods and services in Europe, their economic linkages, and the consequences of internet usage. As proxies for connectivity, these variables may contribute to the FDI attractiveness of countries. The logarithmic variable ln_IT_{it} represents the sum of ICT goods and services exported by country *i* at time *t*. The logarithmic variable ln_Internetit captures the share of individuals who have used the internet in country *i* at time *t*. The idea is that greater connectivity, stronger ICT export capacity, and wider broadband internet penetration will lead to increased FDI inflows in Europe.

Prospective EU member countries (Ukraine, Moldova, Georgia, and the Western Balkans) have undergone substantial political and economic transformation in recent years. Policy stability ($Policy\_stab_{it}$) related to these countries is also included as an influential determinant of FDI.

Details on the definitions, calculation methods, and data sources for both dependent and independent variables are provided in Table B1 (Appendix B). Table 4.1 presents descriptive statistics for all variables for the full sample over the period 2000–2020.

Table 4.1: Descriptive Statistics

Variable	Mean	Median	Min	Max	Std. dev.	Skewness	Kurtosis
ln_FDI	8.467636	8.403446	0.91	13.57963	2.364707	-.985705	5.229275
ln_GDP_PC	9.704209	9.831755	7.27	11.89095	1.403218	-3.207466	22.49464
t_{it}	1.034698	.8686053	0	3.162838	.547226	1.625668	6.541312
EU	.6528822	1	0	1	.4763522	-.6422899	1.412536
EU_AA	.2017544	0	0	1	.4015615	1.486361	3.209269
ln_OFDI_CH	10.78038	11.09974	8.978896	12.27102	.9845134	-.3283369	1.814672
Policy_stb	.4616355	.58989	-2.139184	1.760102	.6951269	-.8716088	3.682175
ln_IT	2.29663	2.39168	-1.609438	4.191584	.963496	-1.528542	7.412652
ln_Internet	3.669401	4.114541	-2.170703	4.593325	1.140538	-2.237515	7.712326

Source: Author’s elaboration

As seen in Table 4.1, the average natural logarithmic form of FDI is 8.47 and its minimum and maximum values are 0.91 and 13.58, respectively. The variables *ln_FDI, ln_GDP_PC,* and *ln_Internet* have a relatively high variability that indicates greater heterogeneity. Despite *ln_FDI, ln_GDP_PC, ln_OFDI_CH, ln_IT,* and *ln_Internet* being log-transformed, their skewness values are negative. A skew to the left might be explained by the fact that initial data series (FDI, GDP per capita) do not approximate the lognormal distribution. Kurtosis of *ln_FDI, ln_GDP_PC,* and t_{ij} indicate a sharp peak with heavy tails closer to the mean (leptokurtic).

The mean and median of *ln_FDI, ln_GDP_PC,* and t_{ij} are close, indicating that the selected datasets have a roughly symmetrical distribution. The Pearson correlation matrix of the variables is presented in Table B2 in Appendix B.

Table B2 shows significant positive correlations between FDI and GDP per capita, EU integration, policy stability, digital infrastructure, and Chinese FDI outflows. The Pearson correlation coefficient between FDI inflows and trade costs, used as a proxy for connectivity, indicates a moderate negative correlation, consistent with our hypotheses and the literature on FDI and trade. All correlation coefficients fall between 0.3 and 0.7, suggesting that the variables are sufficiently large and strongly correlated to support a consistent empirical analysis.

Although FDI has been growing over the last 20 years in Europe, as seen in Section 3, its dynamics have exhibited significant variations. This is especially true for FDI flows to countries with high geopolitical risks. It may take time for investors to become familiar with the culture, institutional structure, risks, and preferences that prevail in a country. Since FDI inflows show a dynamic process in which past investment experience serves as a predictor of future investment paths, we improve our specification by including the lagged dependent variable.

While most of the countries in our sample have a lot in common, namely EU membership or the intention to be part of the EU, there are remarkable differences between them in the level of economic development, patterns of trade, and policy stability. Even when scaling variables by GDP, these differences may create heterogeneity in the effects of FDI determinants across European countries. T To address these problems, we propose the following model (4.3):

$$\begin{aligned} ln\_FDI_{it} = \; & \beta_1 ln\_FDI_{i,t-1} + \beta_2 ln\_GDP\_PC_{it} + \beta_3 t_t\_CH\_NEW \\ & + \beta_4\, t_t\_EU\_NEW + \beta_5\, t_t\_EU\_WB + \beta_6\, t_t\_CH\_WB + \beta_7 EU_{it} \\ & + \beta_8 EU\_AA_{it} + \beta_9 ln\_OFDI\_CH_{it} + \beta_{10} Policy\_stab_{it} \\ & + \beta_{11} Policy\_stab_{it} * EU\_AA + \beta_{12} ln\_IT_{it} \\ & + \beta_{13} ln\_Internet_{it} + u_{it} \end{aligned} \tag{4.3}$$

where, in addition to the variables from Model (4.3), $ln\_FDI_{i,t-1}$ is the lagged variable of FDI inflows to country *i* at time *t*; $t_t\_CH\_NEW$, $t_t\_EU\_NEW$, $t_t\_EU\_WB$, and $t_t\_CH\_WB$ are disaggregated sub-regional indices of trade costs; and $Policy\_stab_{it} \times EU\_AA$ is the interaction term between the policy stability variable ($Policy\_stab_{it}$) and the EU candidacy dummy (EU_AA).

As seen from Model (4.3), to control for unobserved heterogeneities, we first assume that the impact of connectivity between different countries and subregions, and their

European (EU) and non-European (China) partners, on FDI inflows varies. For this, we disaggregate the trade cost index (t_{it}) into the following four groups:

- average trade costs between the Western Balkans and the European Union (t_t*_EU_WB*);
- average trade costs between the new EU candidates and applicants and the European Union (t_t*_EU_NEW*);
- average trade costs between the Western Balkans and China *(*t_t*_CH_WB);*
- average trade costs between the new EU candidates and applicants and China *(*t_t*_CH_NEW).*

Second, the issue of political stability is especially relevant for the countries of the Western Balkans, Ukraine, Moldova, and Georgia. To distinguish between more and less politically stable European countries, we create the variable *Policy_stbit × EU_AA*, which is the interaction term between policy stability (*Policy_stab*$_{it}$) and and the EU candidacy dummy (*EU_AA*). Finally, to control for time dependence and heterogeneity, we apply a special estimation strategy and conduct a series of empirical applications.

4.4.2 Empirical analysis and estimation strategy

In order to identify an appropriate estimator, we first examine our panel dataset for heteroskedasticity and first-order autocorrelation. As reported in Table B3 (Appendix B), both heteroskedasticity and autocorrelation are present in the sample. Therefore, the use of Pooled OLS is not suitable, as ignoring heterogeneity across cross-sections may lead to inconsistent coefficient estimates.

A conventional way to address serial correlation is to adjust the standard errors to account for autocorrelation. However, once such corrections are applied, the standard Hausman test for selecting between fixed and random effects becomes invalid. Given the presence of heteroskedasticity and contemporaneous correlation in a panel structure where $N > T$, we employ Panel-Corrected Standard Errors (PCSE) in Table 4.2.

It should be noted, however, that PCSE does not control for time-invariant unobserved heterogeneity that may be correlated with the regressors. To address this issue, we subsequently conduct a static panel data analysis, allowing for individual fixed effects.

To decide between the fixed-effects (FE) model and the random-effects (RE) model, we perform the Hausman test (Table B4 in Appendix B). From the results, we conclude that the FE estimator is efficient for Model 1, while the RE estimator is efficient for Model 2. More specifically, under the current specification of Model 1, our initial hypothesis that the individual-level effects are adequately captured by a random-effects model is resoundingly rejected. The FE estimator assumes that the country-specific effect is

correlated with the regressors, while in the RE model the country-specific effect is uncorrelated with the regressors.
Moreover, drivers of FDI connectivity tend to rely on between-panel (rather than within-panel) variation, and the use of country-fixed effects (or within-transformation) would lead to a loss of essential information. In a globalized world, the connectivity of one country affects others, particularly in Europe, between the EU and its neighboring countries.
Thus, as a next step, we checked our panel regression for the presence of cross-sectional dependence (Table B5 in Appendix B). Cross-sectional dependence here may also arise when countries respond to common shocks from the financial crisis or the pandemic. The results show sufficient evidence to reject the hypothesis H_0 of cross-sectional independence.
Cross-sectional dependence tests are often conducted in conjunction with tests for the direction of Granger causality. In our case, we employ the test to uncover the causal relationship between FDI and GDP per capita, since multinational firms can contribute to host countries' income through production, labor costs, or technology transfers. The results (Table B6 in Appendix B) indicate that there is no causal relationship from FDI to GDP per capita, but GDP per capita causes FDI inflows in Europe for the period under investigation. Since the causal link between FDI and GDP is not bidirectional, our estimates are likely to be unbiased.
Cross-sectional dependence often results in standard panel unit roots. Since cross-sectional dependence is diagnosed in our panel, we employ non-standard unit root tests. The results for the dependent variable and one of the independent variables (*ln_GDP_PC)* are presented in Table B7 in Appendix B. After testing all variables, we conclude that the dependent variable is stationary, but most of the independent variables are integrated of order I(1). To verify the existence of the long-run link between variables, we test all panels for cointegration (Table B8 in Appendix B). Cointegration is observed in the estimated models.
The presence of cross-sectional dependence, cointegration and problems of endogeneity in the panel dataset requires the implementation of a suitable regression method. Static panel econometric techniques only offer partial solutions. The mean group (*MG*) and common correlated effects (*CCE*) estimators consider heterogeneity and cross-sectional dependence, but these methods require separate time-series regressions for each cross-section; they are only suitable if the time dimension is large enough, which is not the case in our sample.
Perhaps, when N is large, and T is fixed, cross-section dependence is mainly seen as weak and more problematic for macro panels with long time series. Thus, the coefficients are asymptotically unbiased, and dependence remains in the residuals.

In addition to cross-country heterogeneity, FDI is a dynamic process in which international investors tend to invest more in countries where they have previous experience. For this reason, we consider the dynamic nature of FDI by including lagged variables in Model 2 (Table 4.2). The generalized method of moments (GMM) is applicable in this situation.

For a small sample, the Arellano and Bond (1991) difference GMM estimator could be employed. Since our data are non-stationary, the system GMM estimator may be inconsistent. Indeed, while initial levels of the series of the FDI flows are stationary, GDP and trade costs among countries deviate systematically from their long-run value. To avoid problems with the estimation of the two-step GMM weighting matrix, we employ the difference GMM estimator here.

While existing empirical approaches have difficulties with unbalanced panel data, we estimate the models using a new dynamic panel data GMM model with the command *xtdpdgmm* (Kripfganz, 2020).

Since Model 2 is dynamic (with a lagged dependent variable), there is no risk of a spurious regression problem even if the regressors are nonstationary. The GMM estimates are reported in Table 4.2, and the results are compared with alternative PCSE and FE/RE methods, confirming the higher predictive power of the proposed approach.

The diagnostic of the GMM model is tested by the Sargan and Arellano-Bond (AR) statistics. The Arellano-Bond test checks for autocorrelation in the GMM model in first-order differences. The Sargan test assesses the validity of the instrumental variables in the GMM model.

Test results (Table 4.2) indicate that the one-step GMM model specification is appropriate, based on the AR test for autocorrelation of first-differenced residuals and the J-statistic (Sargan–Hansen) for testing the validity of overidentifying restrictions.

The null hypothesis of no first-order autocorrelation (AR(1)) is rejected, while the null hypothesis of no second-order autocorrelation (AR(2)) is not rejected for all measures. This is consistent with expectations, as differenced models including a lagged dependent variable are designed to exhibit first-order but not second-order correlation.

The Sargan test evaluates the null hypothesis (H_0) that the instrumental variables are exogenous, meaning they are uncorrelated with the model error term. H_0 was not rejected, and all p-values fall within the suggested range (0.1–0.2), confirming that the instruments, as a group, appear exogenous. Hence, the diagnostic tests confirm the model's validity.

4.5 Empirical results

The determinants of FDI are analyzed using a GMM approach (Table 4.2).

Table 4.2: Estimation Results for FDI Determinants

	(1)	(2)	(3)	(4)	(5)	(6)
Specification	Model 1			Model 2		
Dependent variable	ln_FDI			ln_FDI		
Estimator	PCSE_1	FE	GMM_1	PCSE_2	RE	GMM_2
L.ln_FDI			0.2032**			0.1951**
			(0.0276)			(0.0255)
ln_GDP_PC	0.4349*	-0.0932	-0.6070**	0.2389	-0.1477+	-0.6857**
	(0.1917)	(0.0817)	(0.1272)	(0.2069)	(0.0816)	(0.0676)
t_{it}	-0.6853**	0.2991+	0.8165*			
	(0.2176)	(0.1603)	(0.3407)			
EU	1.2266*	-0.4345	2.7870*	-0.0906	-0.3290	-0.0697
	(0.4966)	(0.3785)	(1.1558)	(0.5864)	(0.4637)	(0.3968)
EU_AA	0.3577	-0.2585	1.5646*	-0.5401	-0.3382	-0.8074**
	(0.3609)	(0.2522)	(0.7829)	(0.4946)	(0.2842)	(0.3124)
ln_OFDI_CH	-0.3665*	0.0192	-0.1284+	0.1358	0.3786**	0.4852**
	(0.1631)	(0.0780)	(0.0667)	(0.2020)	(0.1074)	(0.1360)
Policy_stb	-0.6321*	0.6127**	-0.0899	-0.3308	0.3411+	0.2088
	(0.2582)	(0.1806)	(0.1900)	(0.2811)	(0.1959)	(0.1288)
ln_IT	0.7958**	0.7494**	0.6043**	0.7101**	0.7090**	0.4183*
	(0.1260)	(0.0846)	(0.1589)	(0.1073)	(0.0825)	(0.1764)
ln_Internet	0.1695	0.2982**	0.1796**	0.1691	0.2520**	0.1888**
	(0.2225)	(0.0814)	(0.0493)	(0.2195)	(0.0811) **	(0.0353)
t_{it}_CH_NEW				-16.6409**	-18.8991	-12.3205**
				(4.6120)	(3.9730)	(3.2360)
t_{it}_EU_NEW				26.6021**	31.4052**	21.8127**
				(7.1912)	(6.0015)	(6.0946)
t_{it}_EU_WB				2.8209**	3.7680**	3.2322**
				(0.7837)	(0.6495)	(0.5226)
t_{it}_CH_WB				-1.0789**	-0.9895**	-0.4116*
				(0.2159)	(0.2045)	(0.1788)
Policy_stb×EU_AA				-0.5581+	-0.1776	-0.5394+
				(0.3068)	(0.2868)	(0.2896)
_cons	5.7834*	5.9033**	8.8006**	0.9254	0.7650	4.3563**
	(2.7275)	(0.8289)	(0.7598)	(2.6792)	(1.1414)	(1.0590)
N	745	745	675	745	745	675
r2	0.4176	0.1982		0.4606		
Model diagnostics (p-values)						
1st order autocorrelation			0.0005			0.0002
2nd order autocorrelation			0.0977			0.1164
Sargan test			0.1897			0.1619

Source: Author's elaboration.
Note: Standard errors in parentheses + p < 0.10, * p < .05, ** p < .01. Fixed effects are omitted for brevity.

As seen in Table 4.2, both model specifications (Model 1 and Model 2) have nearly the same explanatory power. Namely, the chosen independent variables have the same impact directions, except for EU membership and Chinese FDI outflows, as originally envisaged. Most importantly, the hypothesis that with higher connectivity, FDI inflows to the region increase and European integration is strengthened is supported here.

The empirical analysis shows that both aggregate trade costs of each country to the rest of the world (Model 1) and disaggregated trade costs within and between subregions (Model 2) determine FDI inflows in Europe. The FDI coefficient at lag 1 (*L.ln_FDI*) is statistically significant at the 1% level with the expected positive sign in both models (columns 3 and 6), suggesting the dynamic nature of FDI activity. GDP per capita (*ln_GDP_PC*), as a level of economic development, is one of the most important FDI determinants. Empirical papers (Asiedu, 2002; Kaushal, 2021) examine this relationship and argue that higher income could attract more FDI inflows to the host countries. In our case (columns 2-3 and columns 5-6 in Table 4.2), by contrast, the coefficient of *GDP per capita* is negative, suggesting that a lower GDP per capita implies better prospects for FDI in the recipient country. Perhaps for this sample with varying income levels—EU candidates (the Western Balkans, Turkey) and new EU candidates and applicants (Ukraine, Moldova, and Georgia)—investors perceive greater potential for FDI activity.

In regional markets, such as the EU, investors tend to shift to less costly markets, driven, for instance, by lower labor costs and then oriented toward exports. This in turn may lead to more innovation and greater productivity. This is also evident from the studies by Cicak et al. (2015) and Bruno et al. (2020), which report a negative relationship between country income levels and FDI in the economies of Central and Eastern Europe.

Connectivity, measured through trade costs (t_{it}), has, as expected, become a defining feature of the investment activity in the selected countries. In line with the literature (Cardamone and Scoppola, 2012; Ghodsi, 2019), the impact of trade costs (t_{it}) on FDI shows mixed and complex results (Model 1). Namely, by using PCSE (column 1), results confirm a negative and significant impact of trade costs on FDI inflows at the 5% significance level; however, when using panel data analysis (columns 2 and 3), this impact becomes positive.

As suggested by theory, high trade costs (t_{it}) increase horizontal FDI when a firm establishes local production through direct investment in the host country to bypass tariffs on cross-border exports. However, as seen in Section 3, since the 2000s, trade costs and investment frictions in Europe have been reduced. So, with current zero tariffs, European investors locate parts of their production activities in countries where production and trade costs are relatively lower, such as Poland or Ukraine. Consequently, a drop-in trade costs leads to higher vertical FDI (column 1 in Model 1).

The Knowledge-Capital model incorporates both horizontal and vertical motivations of FDI under conditions of low trade costs. Moreover, since Europe serves as an ideal platform to access the entire regional market at minimal overall cost, non-European countries may invest in European countries to produce goods primarily for export to third countries (export-platform FDI).

Disaggregating trade cost indices and comparing the estimates between two models provides further insights. As shown in Model 2 (columns 4-6), the impact of subregional trade costs between the EU and the new EU candidates and applicants (t_{it}_*EU_NEW*) is significant and positive. This suggests that FDI inflows were initially driven by horizontal, market-seeking motives, with investors establishing local production to bypass tariffs ('tariff-jumping'). When tariffs were eliminated following the Association Agreements (AA), the incentive for horizontal FDI decreased. At the same time, trade costs are bilateral, meaning that higher trade costs or less favorable investment conditions in specific host countries, such as Ukraine or Moldova, can still dampen FDI inflows, even if overall regional trends favor investment.

By analogy, the impact of subregional trade costs between the EU and the Western Balkans (t_{it}_*EU_WB*) is significant and positive (columns 4-6 in Model 2). Beyond the horizontal (market-seeking) motive, this suggests that when the entire production process occurs in one of the Western Balkan countries as part of export-platform FDI, higher trade barriers imposed by third countries can increase trade costs, reduce exports, and in turn encourage additional FDI in the region.

The empirical results from the PCSE, RE, and GMM methods (columns 4–6 in Model 2) confirm that increases in trade costs between the new EU candidates and China (t_{it}_*CH_NEW*) and between the Western Balkans and China (t_{it}_*CH_WB*) negatively affected FDI flows to these subregions at a 1% statistical significance level. The negative coefficients of both indices suggest that FDI inflows from China are consistent with vertical or export-platform FDI, where intermediate or final-stage goods are produced in these countries and then sold either back to China or within the EU market. However, caution is needed as country-level data may obscure the exact composition of vertical versus export-platform FDI.

Differences in the magnitude of the trade cost indices within and between subregions (Model 1 and Model 2) and their partners allow us to verify whether foreign direct investment in Europe is more affected by intra-European or extra-European connectivity. As seen in Section 3, although the majority of inflows to Europe in the 2010s came from EU developed countries, Chinese investment in the Western Balkans and some new EU candidates has doubled. Indeed, columns (5)-(6) show the positive impact of global Chinese FDI outflows (*ln_OFDI_CH*) on FDI flows in Europe. The estimated coefficient suggests that a 1-percent increase in China's net FDI outflow is associated with an approximately 0.49-percent increase in FDI inflows in Europe (column 6). The estimates are also robust across specifications.

To tease out the effect of trade costs, it is essential to examine the effect of EU integration. In line with the literature, the estimation results in Model 1 present a positive, significant, and sizable effect of the EU on FDI inflows. It confirms our hypothesis that enhanced connectivity and reduced trade costs have grown in tandem with European membership (*EU*) and Association Agreements (*EU_AA*). However, using the difference GMM method in Model 2, the impact of EU membership (*EU*) on attracting FDI in the region is not statistically significant (column 6), suggesting that EU enlargement was perhaps driven more by trade than by FDI.

By contrast, the coefficient of the *EU_AA* variable is significant, indicating that FDI inflows to the Western Balkans, Turkey, Ukraine, Moldova, and Georgia with Association Agreements are higher than without such agreements The negative sign of the *EU_AA* variable (column 6) may reflect that these countries benefit more from free trade under European Agreements; for example, the Western Balkans are strongly dependent on exports to the EU.

Overall, enhancing integration within Europe, EU membership, and Association Agreements appear to be highly significant determinants of FDI and trade between both European and non-European partners. Estimates of the impact of EU membership and EU candidacy on FDI flows in Europe are mixed but in line with recent literature (Bruno *et al*., 2020; Grieveson *et al*., 2021; Welfens and Baier, 2018).

FDI flows in Europe strongly depend on political stability (*Policy_stb*) in the region (columns 1–2 and 5–6), particularly among EU candidates and new applicants (*Policy_stb × EU_AA*). In particular, political stability (*Policy_stb*) positively affects FDI inflows at the 5% significance level using the FE method (column 2), suggesting that more politically stable countries attract greater FDI. The significant but negative sign of *Policy_stb × EU_AA* (Model 2) indicates that the variables are cointegrated, suggesting a long-run relationship between them. Indeed, prospective EU member countries (Ukraine, Moldova, and the Western Balkans) have experienced substantial economic transformation in recent years.

Information and communication technology and the Internet (*ln_IT, ln_Internet*) help reduce trade costs and thereby expand both trade and FDI flows. In fact, almost all EU-27 economies recorded trade deficits in the ICT sector, reflecting strong demand for ICT products. This has encouraged the establishment of additional production facilities in Europe, possibly not only for domestic markets but also for third-country markets, reflecting export-platform FDI strategies.

4.6 Conclusion and policy implications

Connectivity across Europe matters because the EU's economic and political influence in the region may be as strong as its trade and investment connections with partner countries. European FDI and trade connectivity, therefore, hold the potential to enhance economic growth in each country. However, the literature on connectivity as an indicator of economic cooperation or its effects on trade and FDI remains ambiguous. This paper contributes to the existing literature by identifying connectivity as a variable linked to European integration, trade costs, and FDI, and by constructing an FDI estimation model that includes connectivity as an explanatory factor for FDI flow patterns in Europe.

This paper uses a panel data approach for 39 countries over 2000–2020 to examine how economic and institutional factors, including connectivity, affect FDI flows within Europe and with both European and non-European partners, with a particular focus on China. The novelty of our approach is the inclusion of all countries that currently have or are expected to receive EU membership in the sample. Based on the applied international trade literature, connectivity is measured via international trade costs.

To investigate whether foreign direct investment (FDI) in Europe is more influenced by intra-European or extra-European connectivity, and to differentiate its impacts across the EU, the Western Balkans, and the new EU candidates and applicants (Ukraine, Moldova, and Georgia), we first consider average aggregate trade cost indices for each country with Europe and China as a whole, and then disaggregate these indices by subregional partners. A relatively large decline in trade costs between the Western Balkans and the EU (-45%) over the period 2000–2020 indicates a high level of regional integration, whereas a smaller reduction (-35%) between the EU and China reflects growing but more moderate integration with non-EU partners.

The analysis confirms a causal link between connectivity and FDI: as trade costs gradually decrease over time, FDI growth across all selected countries steadily increases throughout the period. Additionally, the Granger causality test indicates no feedback from FDI to GDP per capita, while GDP per capita significantly drives FDI inflows in Europe during the investigated period.

The empirical results from the PCSE, FE/RE, and GMM methods support the hypothesis that higher connectivity increases FDI inflows and strengthens European integration. Both aggregate trade costs to the rest of the world and disaggregated trade costs within and between subregions significantly influence FDI inflows in Europe. The findings confirm that reductions in trade costs work in tandem with EU membership and Association Agreements to promote FDI.

Disaggregating trade cost indices provides insights into FDI dynamics in Europe. Initially, FDI inflows were primarily horizontal, market-seeking investments, with local production established to bypass tariffs ('tariff-jumping'). After the elimination of tariffs through Association Agreements, the incentive for such horizontal FDI decreased. Nevertheless, bilateral trade costs and less favorable investment conditions in specific countries can still dampen inflows.

At the same time, higher trade costs with China negatively affect FDI from non-European partners, consistent with vertical or export-platform FDI, where goods are produced locally for sale either back to China or within the EU, although country-level data may obscure the precise composition of these flows.

The paper also shows that enhanced connectivity has significantly improved the prospects for European integration, which in turn has facilitated both trade and FDI in Ukraine, Moldova, and Georgia. Moreover, FDI flows in Europe are highly dependent on political stability across the region.

Moreover, when trade and FDI flows from non-European partners, such as China, to the Western Balkans or the new EU candidates are restricted by increasing trade costs or stricter investment regulations, the EU faces stronger incentives to direct investment toward these subregions. Policy pressures, geopolitical risks, and economic cooperation are likely to enhance European regional connectivity, eventually shifting FDI patterns toward more intraregional investment. To date, however, trade and FDI connectivity remain predominantly global rather than regional. These findings are particularly relevant for policymakers, as evolving determinants of FDI call for adaptive public policies in the selected countries.

Appendix B

Table B1: Definition of the independent variables

Independ. Variables	Name	Description	Unit of Account	Source
GDP per capita	*ln_ GDP_PC*	Gross domestic product divided by midyear population. GDP per capita, deflated by the domestic GDP deflator for each country over time; base year varies by country (in logarithmic form).	Millions of USD	World Development Indicators
Trade costs	$t_{i,t}$	Two series of trade cost indices: • individual average trade costs for each sample country (Model 1); • Average aggregate trade costs between some subregions (Model 2).	Index	Own calculation based on the Novy (2013) inverse-gravity method
EU membership	*EU*	Sample country is an EU member.	0,1	European Commission website https://ec.europa.eu/info/policies/eu-enlargement_en
European Union Association Agreement	*EU_AA*	Sample country has an Association Agreement with the EU in force.	0,1	European Commission – Regular report https://www.consilium.europa.eu/en/documents-publications/treaties-agreements/
China's net outflow of FDI	$ln\_OFDI\_CH_{it}$	Chinese foreign direct investment, net outflows (in logarithmic form).	Millions of USD	World Development Indicators
Information and communication technology	ln_IT_{it}	Calculated sum of information and communication technology goods and services exported (in logarithmic form).	% of total goods and service exports	World Bank Data
Internet users	$ln\_Internet_{it}$	Individuals using the Internet via computer, mobile phone, personal digital assistant, game console, digital TV, etc. (in logarithmic form).	% of population	World Development Indicators
Political Stability	$Policy\_stab_{it}$	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism.	Index	Worldwide Governance Indicators

Source: Author's elaboration.

Appendix B

Table B2: Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) ln_FDI	1.000								
(2) ln_GDP_PC	0.517*	1.000							
(3) t_{ij}	-0.326*	-0.258*	1.000						
(4) EU	0.514*	0.660*	-0.600*	1.000					
(5) EU_AA	-0.232*	-0.300*	0.370*	-0.689*	1.000				
(6) ln_OFDI_CH	0.082*	0.144*	-0.192*	0.216*	-0.078*	1.000			
(7) Policy_stb	0.369*	0.560*	-0.461*	0.650*	-0.308*	-0.069	1.000		
(8) ln_IT	0.494*	0.437*	-0.201*	0.443*	-0.150*	0.227*	0.452*	1.000	
(9) ln_Internet	0.424*	0.616*	-0.341*	0.576*	-0.137*	0.520*	0.416*	0.462*	1.000

Source: Author's elaboration.
Note: *shows significance at p<0.05

Table B3: Panel Heteroskedasticity and Autocorrelation Tests

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	**Wooldridge test for autocorrelation in panel data**
Ho: Constant variance Variables: fitted values of ln_FDI chi2(1) = 104.92 Prob> chi 2 = **0.0000**	H0: no first-order autocorrelation F (1, 16) = 20.198 Prob> F = **0.0004**
Conclusion: evidence of significant differences across countries	Conclusion: autocorrelation in panel data

Source: Author's elaboration.

Table B4: Hausman (1978) specification test

Model 1		**Model 2**	
	Coef.		*Coef.*
Chi-square test value	120.698	Chi-square test value	3.026
P-value	**0.000**	P-value	**0.995**

Source: Author's elaboration.

Table B5: Average correlation coefficients & Pesaran (2004) CD test

variable	panels	CD-test	p-value
ln_FDI	38	23.22	0.000
ln_GDP_PC	38	88.24	0.000
t_{it}	38	74.82	0.000
EU	38	-	-
EU_AA	38	-	-
ln_OFDI_CH	38	121.50	0.000
Policy_stb	38	9.29	0.000
ln_IT	38	14.32	0.000
ln_Internet	38	107.96	0.000

Source: Author's elaboration.
Notes: Under the null hypothesis of cross-section-independence CD ~ N(0,1)

Appendix B

Table B6: Dumitrescu and Hurlin (2012) Granger non-causality test results

H0: ln_GDP_PC does not Granger-cause ln_FDI	H0: ln_FDI does not Granger-cause ln_GDP_PC
Lag order: 1 W-bar = 2.0829 Z-bar = 3.1571 (p-value = 0.0016) Z-bar tilde =2.2018 (p-value = **0.0277**)	Lag order: 1 W-bar = 1.8453 Z-bar = 2.4645 (p-value = 0.0137) Z-bar tilde = 1.6509 (p-value = **0.0988**)

Source: Author's elaboration.

Table B7: Pesaran Panel Unit Root Test (Cross-Section & First-Difference Mean)

for *ln_FDI*				for *ln_GDP_PC*			
Deterministic chosen: constant Dynamics: lags criterion decision General to Particular based on F joint test H0 (homogeneous non-stationary): bi = 0 for all i CIPS = -2.923 N,T = (17,21)				Deterministic chosen: constant Dynamics: lags criterion decision General to Particular based on F joint test H0 (homogeneous non-stationary): bi = 0 for all i CIPS = -1.331 N,T = (17,21)			
	10%	5%	1%		10%	5%	1%
Critical values at	-2.070	-2.150	-2.320	Critical values at	-2.070	-2.150	-2.320

Source: Author's elaboration.

Table B8: Kao Residual Co-Integration Test

Ho: No cointegration	Number of panels = 38
Ha: All panels are cointegrated	Avg. number of periods = 16.211
Cointegrating vector: Same	Kernel: Bartlett
Panel means: Included	Lags: 1.42 (Newey-West)
Time trend: Not included	Augmented lags: 1
AR parameter: Same	

	Statistic	p-value
Modified Dickey-Fuller t	-5.6372	0.0000
Dickey-Fuller t	-7.1175	0.0000
Augmented Dickey-Fuller t	-2.5258	0.0058
Unadjusted modified Dickey-Fuller t	-11.0552	0.0000
Unadjusted Dickey-Fuller t	-9.0993	0.0000

Source: Author's elaboration.

5 FDI determinants across Europe and Chinese Influence[3]

5.1 Introduction

While global foreign direct investment (FDI) modestly increased in 2019 after sizable declines, FDI flows in Europe increased by 18 percent, mostly driven by rising FDI flows to the European Union (EU) and neighboring countries (World Investment Report, 2020). Nonetheless, FDI inflows and outflows fell in some principal developed European economies. The shock of the pandemic added to the volatility of FDI.

Traditionally, the Netherlands, Germany, France, and Italy attract about 42–48% of FDI flows in the EU-28 economy, and together with Luxembourg and Spain, they invest more than 50% of all outflows from the EU. The dominant FDI strategy seems to be horizontal (market-seeking) FDI, where the size of economy matters.

Since the mid-2000s, with EU enlargements, there has been a shift in the European FDI landscape, as EU membership spurred FDI growth to the accession countries by reducing trade costs and eliminating investment barriers. In 2007, for the first time, FDI to the new EU member states (NMS) accounted for more than 50% of GDP, making EU membership a key FDI determinant.

Trade costs, as a proxy for connectivity, are widely recognized in the literature as a key determinant of FDI (Markusen, 2002; Blonigen, 2005). On the one hand, higher trade costs promote market-seeking (horizontal) FDI, since investors can avoid existing tariff and non-tariff barriers in the host country and access new markets. On the other hand, reduced trade costs boost efficiency-seeking (vertical) FDI via lower production and operation costs and differences in factor endowments.

Improving connectivity has led to decreasing FDI flows to the EU as a whole and partially reoriented investors towards new EU member states (NMS) (Estonia, Latvia, Lithuania, Czechia, Slovakia, Poland, Hungary, Slovenia, Romania, Bulgaria, and Croatia), candidate countries (Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia), and potential candidate Kosovo (Figure 5.1).

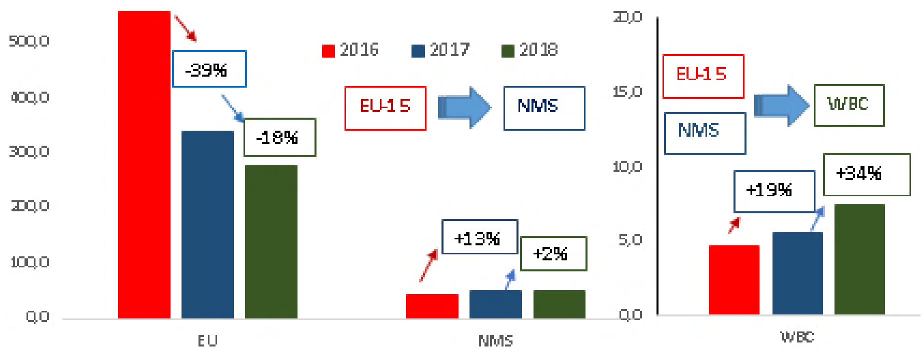
As illustrated in Figure 5.1, with decreasing FDI flows to the EU as a whole, investment to NMS increased in 2016–2018 on average by 10% and by more than 25% to the Western Balkans, respectively. Starting from the point that, for transition countries, perhaps market growth potential and trade costs are more valuable than market size, the preferential strategy became complex and export-oriented FDI.

Most FDI inflows to NMS and Western Balkans originated in developed EU member countries. However, since 2013, the Belt and Road Initiative (BRI) has been adopted, FDI

[3] This chapter reproduces the author's previously published work: Dorakh, A. (2021). *FDI determinants in Europe and Chinese influence*. *Serbian Journal of Management, 16*(1), 21–37. https://doi.org/10.5937/sjm16-22279

to BRI countries increased sharply, making connectivity one of the most influential FDI factors. As a result, the share of Chinese investment in the region, mostly asset- and market-seeking FDI, has doubled over the last five years. Czechia, Hungary, Poland, and Serbia are the largest recipients of Chinese investment. For the first time, the Western Balkans' share of FDI in transition economies between 2013 and 2019 increased from 8 to 13% (World Investment Report, 2020). A large number of the projects target export-supported FDI.

Figure 5.1: Dynamics of FDI Inflows to the EU, NMS, and WBs (USD Million)



Source: Prepared by the author based on World Bank and UNCTAD data.

The most prominent factor for extra-EU investors, mostly from China, is that the Western Balkans, as candidate countries for the EU, have a unique position because specific trade and FDI restrictions do not apply to them, while access to the European market is available. At the same time, FDI inflows, as a share of GDP, grow much faster in the Western Balkans than in the EU or the world. Thus, Europe and Asia are highly interconnected, allowing China to expand its influence in trade and FDI through the far-reaching connectivity concept.

Today, the same determinants that propelled the early growth of FDI, namely trade liberalization and fragmentation of production, have started pushing in the opposite direction, with a return of protectionist tendencies. This implies a shift from export-oriented and efficiency-seeking FDI to regional market-seeking FDI and infrastructure investment. Connectivity, relocation, redistribution, and technology will become dominant FDI factors.

In this paper, we analyze patterns and determinants of FDI in Europe, in particular the roles of trade costs and connectivity in determining the volume of FDI, and compare the impacts of EU and BRI membership in shaping FDI patterns across European countries.

Stimulated by influential FDI papers, we create panel data for 34 countries over 2000–2019, and, by combining it with calculated trade cost indices, empirically explore the heterogeneity across different types of FDI determinants as well as across countries and time.

The paper is structured as follows. In Section II, we provide the most influential FDI theories and review the literature. In Section III, we describe the stages of the analysis and report empirical results. Section IV presents the conclusions and policy implications.

5.2 Theory and empirical studies of FDI

Determinants of FDI vary across countries and regions and change their nature over time. To explain the phenomenon of FDI, a large number of theoretical models have been developed, including neoclassical trade theory, market imperfections, product lifecycle theory, and eclectic paradigms. In the strictest version of the neoclassical theory, the poorest countries should have the highest return to capital and, for this reason, attract the most FDI. However, over the last five decades, developed countries, which are capital-abundant, have received a larger share of FDI flows (World Investment Report, 2020). Alternatively, within the theory of industrial organization, many conceptual frameworks have been proposed, but here FDI is motivated only by firm-specific factors without including host-country factors.

The canonical model for determinants of FDI begins with the earlier research work of Dunning (1973), which provides a comprehensive analysis based on the ownership, location, and internationalization (OLI) paradigm. According to the theory, there are two main reasons why firms internationalize production: market-seeking and efficiency-seeking. Given the multinational nature of foreign firms, Markusen (1984, 2000) constructs a horizontal FDI model, suggesting that companies prefer to enter the foreign market via FDI rather than via export with higher trade costs. Market size and access to new countries seem to be the most common reasons for multinational FDI activity. Hence, horizontal firms intend to improve connectivity while saving trade costs (transportation costs, tariffs, investment barriers).

As a counterweight, Helpman (1984, 2006) introduces vertical FDI, where transport costs and tariffs are assumed away, so production facilities are not established to save transport costs but based on differences in relative factor endowments. Thus, vertical FDI and trade costs are negatively related. This means that reducing trade costs increases connectivity, which, in turn, boosts FDI. This approach was later extended by Markusen (2002), who combined horizontal and vertical models into the Knowledge-Capital Model (KC), where all types of multinational companies can coexist based on various host- and source-country characteristics. Another valuable extension of the KC model was provided by Baltagi, Egger, and Pfaffermayr (2007), who introduce complex vertical FDI with relocation of production processes to different neighboring countries with more promising endowments. Blonigen et al. (2007) suggest export-platform FDI, where trade costs are low enough between several potential host destination markets compared to the trade costs between the home and destination countries. In that case, the multinational firm will select the most favorable destination market to serve other host markets through exports.

The prevailing ownership-based theories of FDI are increasingly being challenged by new forms of technologies, infrastructure investment, reduced trade costs, and the development of Asian network multinational enterprises (World Investment Report, 2020).

The existence of multilateral FDI strategies has significant implications for empirical studies on FDI. While a vast literature suggests that the major determinants of FDI inflows include macroeconomic variables such as economic size and growth (Bevan and Estrin, 2004; Blonigen and Piger, 2014), labor force and human capital (Jirasavetakul and Rahman, 2018), international trade (Asiedu, 2002, 2006), and infrastructure development (Canh N. Phuc et al., 2020), only a few papers analyze the impact of EU membership on FDI (Cardamone and Scoppola, 2012; Bruno et al., 2017; Welfens and Baier, 2018). To date, no study focuses on whether and how connectivity determines the volume of FDI, comparing the impacts of EU and BRI membership in shaping FDI patterns across Europe.

Connectivity initiatives are a modern tool for advancing influence in international trade and FDI, and this paper aims to contribute to this growing literature. This article sets out to provide more clarity about connectivity in the EU, distinguishing between developed EU countries and NMS, as well as comparing NMS and candidate countries (Western Balkans). Particular focus will be placed on connectivity as a degree of economic integration in Europe in recognition of Chinese influence.

Current existing studies (Bevan and Estrin, 2004; Bruno et al., 2017; Mistura and Roulet, 2019) estimate the effects of EU integration using gravity models. Borrowing this approach from international trade studies, the FDI gravity equation is extensively applied. However, to understand the average effects of determinants on FDI across Europe, country-specific factors need to be considered. In gravity models, individual country factors are usually hidden in the fixed-effects estimates. Specifically, to obtain more reliable FDI estimates, we simultaneously tested the random-effects model as well as the fixed-effects model. This is because the role of EU membership is not equal across Europe. In addition to the previous literature, we split the impact of EU integration among the new and old EU member states, as well as the candidate countries. For this, we suggested different samples and used various methods to compare results with each other and with existing studies.

Most importantly, in addition to existing studies, we formulated the FDI model in Europe with Chinese influence. For this, we estimate the potential effect of trade costs on FDI as a proxy for connectivity, since trade costs include FDI-restrictive measures for countries.

A negative relationship between restrictions and the value of trade has been observed mostly in the existing trade, but not FDI, literature. Moreover, the trade studies concentrated mostly on advanced economies; the few studies on the EU did not consider candidate EU countries and potential candidates. This paper adds to the literature by extending the assessment to groups of advanced EU countries, NMS, and Western Balkans, and distinguishing between the impacts of EU- and BRI-membership on FDI.

Based on the paper by Novy (2011), we calculated and presented indices of total bilateral trade costs for selected countries with respect to their trade partners, and, second, evaluated the impact of connectivity on FDI by incorporating trade costs into the baseline empirical model. Thus, the elasticity of connectivity between EU members, non-members, and non-continental large trade and FDI partners, especially China, provides a quantitative measure for better understanding and comparing the depth of EU integration and the BRI project.

European integration is realized differently across FDI inflows to developed EU countries, the new EU member states, and the Western Balkans (Jirasavetakul and Rahman, 2018). To apply this idea to the BRI concept, using panel data analysis, we show that, at the beginning, Chinese investment was low to NMS and the Western Balkans, but when the BRI was adopted, FDI to the region increased sharply, making connectivity one of the significant FDI determinants.

Besides the traditional FDI determinants, we also develop and test factors connected with digital infrastructure and the relocation of international production (Kano et al., 2020). This is based on the premise that FDI may shift from export-oriented and efficiency-seeking FDI to regional market-seeking FDI in Europe.

5.3 Empirical analysis of FDI determinants and results

To investigate the key factors that affect FDI across Europe, we present a series of empirical applications and create different samples. The idea is that if we think of the EU as the Single Market, then FDI would be represented by both horizontal and vertical FDI strategies, consolidated in the KC model. But when we add Western Balkans and disaggregate samples, we then see the export-platform phenomenon and complex vertical FDI. Another reason for disaggregating is that there are important differences between Chinese investment behavior in the developed EU countries, NMS, and Western Balkans. Thus, the baseline FDI sample covered 34 countries: EU-28 and 6 Western Balkans, including the further split between EU-28, EU-13, and Western Balkans. Selected countries form 89% of all European FDI, so the sample seems to be highly representative. The data are annual and cover the period from 2000 to 2019 for all the constituent countries (except Kosovo, due to unavailability of data).

The study is based on secondary transparent data collected from the World Bank Indicator Databank and the Penn World Table 10.0 (2020). Since a single FDI dataset for the NMS as well as the Western Balkans is nonexistent, we separately compiled scattered data from the national banks and agencies of the host countries. Missing FDI values were replaced with zeros (Bevan and Estrin, 2004).

The baseline equation takes the following functional form (Formula 5.1):

$$\begin{aligned} lnFDI_{i,t} = \beta 0 &+ \beta_1 lnGDP_{i,t} + \beta_2 lnGDPP_{i,t} + \beta_3 ULC_{i,t} + \beta_4 HCapital_{i,t} \\ &+ \beta_5 OFDIChi_{i,t} + \beta_6 Ports_{i,t} + \beta_7 Internet_{i,t} + \beta_8 EU_{i,t} + \beta_9 BRI_{i,t} \\ &+ \beta_{10} Openness_{i,t} + \beta_{11} ICT_{i,t} + \beta_{12} Railway_{i,t} + \beta_{13} HiTech_{i,t} \\ &+ \beta_{14} TC_{i,t} + \alpha_i + \gamma_t + \varepsilon_{i,t} \end{aligned} \tag{5.1}$$

where:

- $lnFDI_{i,t}$ — logarithm of net FDI inflows (million US dollars)
- α_i — individual country effects (fixed or random, depending on Hausman test)
- γ_t — time effects
- $\varepsilon_{i,t}$ — idiosyncratic error term

A detailed description of all other independent variables expected to determine FDI are presented in Table C1, Appendix C.

Based on the theoretical framework, the following hypothesis is formulated: FDI inflows are positively influenced by market size, human capital, connectivity, and institutional integration (EU/BRI), and negatively influenced by labor costs and trade costs, with effects varying across country groups and regions.

Since one of the main objectives of this analysis is to quantify the influence of China on FDI and to assess the role of connectivity, the BRI, and infrastructure in shaping FDI patterns across selected countries, we include a comprehensive set of potential determinants and effects. In particular, following the emerging literature on FDI, China's outward FDI ($OFDIChi$) is incorporated into the model. We posit that Chinese FDI tends to be attracted to European countries with access to the Single Market, as reduced trade costs facilitate investment flows. Lower trade costs (TC), used here as a proxy for improved connectivity, may therefore represent a key factor driving FDI.

For each year in the period 2000–2019, total bilateral trade costs for 34 countries and their partners were calculated based on the model developed by Novy (2011). Particular attention was given to connectivity with China as a key trade and investment partner. On the one hand, trade costs generally reflect the degree of European integration—both among EU member states and between the NMS and candidate countries. On the other hand, changes in trade costs may serve as a measure of Chinese influence and the effectiveness of BRI in Europe. Specifically, if a country effectively utilizes BRI funds to improve infrastructure, it can further enhance its attractiveness to FDI.

To measure connectivity, alongside the effects of EU integration and BRI participation, both physical infrastructure quality (*Ports, Railway*) and digital infrastructure (*Internet, ICT, and HiTech*) were evaluated. Remarkably, the relationships between trade costs, infrastructure, and FDI have received far less attention in the literature. Using these variables, we aim to demonstrate a clear and positive correlation between European integration, cooperation with China, and regional differences in infrastructure adequacy. Evidently, all infrastructure indicators tend to be higher in higher-income countries. While the average infrastructure quality of the NMS and Western Balkans remains below that of the developed EU countries, this may, in turn, encourage their participation in BRI projects.

Once the essential relationship between EU and BRI membership and the rate of connectivity is established, we estimate the model first for the whole sample of countries, and then separately for the EU-28, EU-13, and Western Balkans. The comparative FDI analysis, which simultaneously reflects the degree of connectivity among selected countries, shows how the determinants of FDI vary within and outside the EU, as well as across BRI and non-BRI countries. A special focus is placed on identifying whether the NMS are more attractive to Chinese FDI than the Western Balkan region.

Conducting separate analyses for developed EU countries, NMS, and candidate countries also allows us to capture the effect of EU integration on FDI. This approach makes it possible to highlight the main differences in FDI activity before and after EU enlargement. We begin with an OLS model, which, although not suitable as a benchmark, provides a useful point of comparison. To address potential endogeneity issues, several instrumental variables are then introduced in the Two-Stage Least Squares (2SLS) estimation. Our results are presented in Table 5.1.

As seen in columns (1)–(8) of Table 5.1, on average, 70% of the variation in FDI flows across the sample countries is explained by the specifications. This confirms that the selected variables are relevant determinants of FDI inflows in Europe. Following the idea that the importance of determinants depends on the FDI strategy of home countries, we can suppose that the traditional framework of horizontal and vertical FDI is no longer fully representative, and connectivity increasingly shapes new complex vertical and export-oriented FDI strategies.

Traditionally, *GDP*, as a proxy for market size, positively influences FDI prospects. *GDP per capita* is often used to measure the economic development. As shown in columns (1)–(8) of Table 5.1, the coefficients of *GDP* are statistically significant and positive across all country groups, while the coefficient of *GDPP* is negative for the EU-28 (β = -0.4307) and EU-13 (β = -0.7526), and positive for the Western Balkans (β = 1.2602).

Table 5.1: Panel Estimation of the Determinants of FDI in Selected Countries

Model	(1) *OLS*	(2) *2SLS*	(3) *OLS*	(4) *2SLS*	(5) *OLS*	(6) *2SLS*	(7) *OLS*	(8) *2SLS*
Sample	All selected countries		EU-28		EU-13		WB	
Dep. var.	*lnFDI*		*lnFDI*		*lnFDI*		*lnFDI*	
lnGDP	1.0062**	0.9333**	1.0917**	0.9492**	1.1288**	1.0641**	0.5592**	0.6958**
	(0.0562)	(0.0768)	(0.0613)	(0.0811)	(0.0847)	(0.0948)	(0.1448)	(0.1491)
lnGDPP	-0.2393*	-0.1350	-0.4307**	-0.2284	-0.7526**	-0.7041**	1.2602**	1.3472**
	(0.1192)	(0.1408)	(0.1507)	(0.1689)	(0.2308)	(0.2333)	(0.3950)	(0.3974)
ULC	-0.0006**	-0.0006**	-0.0011**	-0.0012**	0.0005	0.0006	-0.3122**	-0.3001**
	(0.0001)	(0.0001)	(0.0004)	(0.0004)	(0.0006)	(0.0006)	(0.1118)	(0.1124)
HCapital	-0.3626*	-0.3921**	-0.7067**	-0.7621**	-0.4644	-0.4224	0.4949+	0.5622+
	(0.1455)	(0.1472)	(0.1796)	(0.1818)	(0.3821)	(0.3836)	(0.2838)	(0.2856)
OFDIChi	-0.3043**	-0.2774**	-0.2752**	-0.2083*	-0.2234+	-0.1833	-0.4675**	-0.5127**
	(0.0667)	(0.0695)	(0.0791)	(0.0833)	(0.1213)	(0.1243)	(0.1468)	(0.1479)
Ports	0.1493**	0.1455**	0.0801	0.0759	-0.0294	-0.0482	0.1344+	0.1526*
	(0.0430)	(0.0432)	(0.0488)	(0.0491)	(0.0679)	(0.0691)	(0.0733)	(0.0738)
Internet	0.3221**	0.2878**	0.5061**	0.3810+	0.5435*	0.4959*	0.1382	0.1072
	(0.1001)	(0.1032)	(0.1900)	(0.1965)	(0.2242)	(0.2266)	(0.1337)	(0.1346)
EU	-0.1648	-0.1410	-0.3176	-0.2485	0.1641	0.2048	0.1389	0.1153
	(0.1584)	(0.1596)	(0.2149)	(0.2176)	(0.2261)	(0.2280)	(0.2176)	(0.2186)
BRI	-0.2839*	-0.3109*	-0.2808+	-0.3383*	-0.3923*	-0.4184*	-0.1895	-0.1591
	(0.1431)	(0.1446)	(0.1625)	(0.1647)	(0.1877)	(0.1887)	(0.2189)	(0.2201)
Openness	0.9854**	0.9122**	1.2143**	1.0667**	0.9347**	0.8842**	-1.0696**	-1.1567**
	(0.1122)	(0.1240)	(0.1251)	(0.1371)	(0.2332)	(0.2359)	(0.3620)	(0.3643)
ICT	0.0408**	0.0419**	0.0447**	0.0474**	0.0248**	0.0258**	0.1306	0.0263
	(0.0067)	(0.0068)	(0.0071)	(0.0072)	(0.0084)	(0.0084)	(0.1941)	(0.1966)
Railway	-0.0257	-0.0018	-0.0152	0.0289	-0.0859+	-0.0721	-0.0758	-0.0971
	(0.0324)	(0.0367)	(0.0394)	(0.0429)	(0.0486)	(0.0495)	(0.0599)	(0.0604)
_cons	5.6240**	5.9157**	6.0049**	6.6280**	4.0702	4.1631	7.3922	4.7219
	(1.5802)	(1.5962)	(2.2159)	(2.2401)	(2.9589)	(2.9635)	(4.7941)	(4.8589)
N	606	606	498	498	229	229	108	108
r2	0.7178	0.7170	0.6721	0.6685	0.6075	0.6064	0.6779	0.6749

Source: Author's elaboration.
Note: Standard errors (clustered by country) are in parentheses. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

In Table 5.1, the estimated coefficient for *GDPP* confirms the relationship between country income levels and FDI across Europe, indicating that investors tend to see better prospects in lower-income markets. As a first result, the *negative* sign of the coefficient for *GDPP*, used as a proxy for country development, supports horizontal FDI for the EU-28 and NMS, whereas the positive sign of the coefficient for the Western Balkans is consistent with vertical FDI. At the same time, according to the literature (Bruno et al., 2017), *GDPP* primarily reflects the growth of relative factor endowments, particularly labor costs. Consequently, if the GDPP coefficient is negatively correlated with FDI, it may, according to the literature, indicate vertical FDI: higher labor costs increase production costs, thereby reducing FDI inflows.

In support of this claim, unit labor cost *(ULC)* was chosen as the appropriate measure of differences in factor endowments, rather than simple relative wage rates, since *ULC* also includes non-wage labor costs. As expected, for all countries in the sample, there is a negative correlation between FDI and *ULC*, but for EU-13, *ULC* is not significant, which does not clearly indicate vertical FDI. In contrast, for the Western Balkans, the magnitude of the estimated *ULC* coefficient is significant and noticeably stronger. This indicates that the importance of vertical factors for FDI inflows in the region is more pronounced than in the EU.

When lower *ULC* is a key determinant for increasing vertical FDI, human capital (*HCapital*) tends to matter considerably when strategic asset-seeking is an important investment motivation (Dunning, 1973, 2008). From our results (Table 5.1), for all selected countries and EU-28, *HCapital* is statistically significant and negative; for EU-13, this coefficient is not significant; and for the Western Balkans, it is positive. Specifically, we suppose that for NMS, labor-seeking motivation is a primary reason underlying FDI inflows, and human capital may not matter much. At the same time, production becomes more capital-, knowledge-, and skill-intensive and requires well-educated human capital. Thus, the positive *HCapital* coefficient in the Western Balkans reflects its role as a key factor in participation in the Global Value Chain (GVC). Moreover, today, digital platforms, data flows, and data processing have changed the way firms interact, reducing the importance of the human component in production and investment (Kano, 2020). Therefore, *HCapital* for EU-28 is significant but negative. As seen, the relative importance of human capital (*HCapital*) and labor cost (*ULC*) as motivations for FDI is changing over time and across countries.

In the context of Chinese influence on FDI, a negative coefficient of human capital (*HCapital)* in the EU-28 discourages vertical FDI but may suggest asset-seeking FDI (brands, distribution networks, etc.) in the developed EU countries.

Our empirical results point to a combination of efficiency-seeking, market-seeking, and asset-seeking strategies, consistent with the Knowledge-Capital model of FDI for the EU-28, while FDI strategies for the EU-13 and Western Balkans are less clear. Supporting the KC model, the coefficient of information and communication technology (*ICT)* is positive and significant for all EU countries. ICT is believed to lower transaction and production costs for foreign investors and improve access to information. Notably, *ICT* is not significant for the Western Balkans, suggesting that FDI in the region is motivated by more complex factors. In this case, the type of FDI also depends on the country's degree of openness to trade.

Openness to international trade (*Openness*) allows us to test for the differential relationship between FDI and trade across countries. Investors tend to invest in the trade partner markets with which they are familiar via export. For this purpose, the volume of trade is enhanced, and thus *Openness* is expected to be a positive and significant FDI determinant. Indeed, as seen from Table 5.1, the coefficient of *Openness* is positive for all countries from the EU and negative for the Western Balkans. It confirms the benefits of the EU and Single Market in the traditional sense: foreign firms set production in the partner country in Europe to serve the European market. But when we focus on the candidate countries, trade and FDI could be substituted; much of FDI is export-oriented, applying complex and export-platform FDI in the Western Balkans.

Thus, *Openness* reflects EU membership that enlarges the potential market size for investments, reduces trade barriers, and improves connectivity. If countries form a free trade agreement—in our case, the European Single Market—the outside country may opt to build a plant inside the bloc and export to other countries in the EU (Blonigen et al., 2007). But the key assumption driving export-oriented FDI is lower trade costs.

Nevertheless, our findings should be taken only as preliminary evidence and do not account for many elements, including controls for time and country factors, and do not adjust for endogeneity concerns. That is why the coefficient of EU membership (*EU*) is not statistically significant for all selected countries.

To address potential endogeneity issues, several potentially endogenous regressors, including EU membership and trade costs, are instrumented using lagged values and country-specific historical determinants, following standard practice in panel FDI studies (Bevan & Estrin, 2004; Blonigen & Piger, 2014) in a Two-Stage Least Squares (2SLS) framework.

Results from Table 5.1 support the predicted negative relationship between Chinese FDI outflows (*OFDIChi)* and total FDI to the selected countries, with significant differences in the beta coefficients. A comparison of the estimated coefficients suggests that the Western Balkans ($\beta = -0.467$) are less affected by shifts in Chinese FDI than all European countries ($\beta = -0.275$) and NMS ($\beta = -0.223$), respectively. This negative relationship supports the assumption that FDI inflows to the Western Balkans, as well as to other countries, originate not from China but mostly from developed EU countries.

With the Belt and Road Initiative (*BRI*), China is becoming an important player in Europe, particularly in NMS, where Western companies have gradually reduced their engagement. Specifically, the regression coefficient for BRI in Table 5.1 is significant at the 10% level for EU-28, at the 5% level for EU-13, and not significant for the Western Balkans. Importantly, this indicates that BRI facilitates access and fosters deeper economic connectivity between the EU and China.

Although BRI participation is included as an independent determinant (*BRI*), its coefficient remains negative, indicating that, *ceteris paribus*, BRI membership has not yet translated into higher FDI inflows across Europe. Many countries that joined the BRI already exhibited weak FDI performance, so the negative sign partly reflects their pre-existing conditions rather than a causal effect of the initiative itself. Most European BRI participants are less developed economies—particularly in the Western Balkans and Eastern Europe—with lower FDI attractiveness due to smaller market size, weaker institutions, and higher perceived risk. A composition effect may also be at play: even if Chinese FDI rises, total FDI could decline if Western investment falls more sharply. Furthermore, much of the BRI support consists of loans and public investment rather than private FDI, which may not immediately appear as inflows in FDI statistics.

Therefore, the negative coefficient does not necessarily imply that the BRI discourages investment; rather, its positive effects on overall FDI may emerge gradually or indirectly, for example, through infrastructure improvements and enhanced connectivity.

However, the sample countries are highly heterogeneous, and the interpretation of estimates may be distorted by inappropriate estimation techniques. The 2SLS model appears more robust than OLS with respect to control variables but assumes no differences among countries.

Our hypothesis is that the ability of countries to attract FDI and maximize the benefits of EU integration and BRI participation depends on each country's level of connectivity. In the context of FDI, connectivity extends beyond physical infrastructure, encompassing broader economic and institutional linkages, which makes its effect difficult to quantify directly. To address this, we employ trade cost analysis to approximate the role of connectivity. Specifically, trade costs are used as a proxy for connectivity, as they implicitly capture FDI-restrictive measures faced by countries.

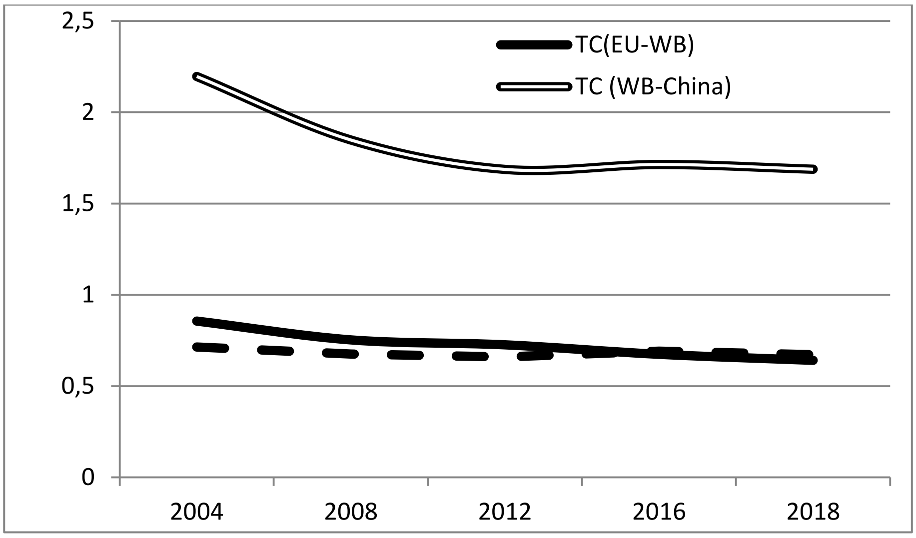
First, we calculated indices of total bilateral trade costs, which capture all the costs of trading goods between two countries relative to the cost of trading domestically in each of the selected countries. Second, the impact of connectivity on FDI is evaluated by incorporating these trade cost measures into the baseline empirical model.

The trade cost index (*TC)* is derived from production and export data for manufactured goods, following the gravity framework proposed by Novy (2011) (see Formula 4.1 in Chapter 4). This approach estimates bilateral trade costs from domestic and international trade flows. The value of intranational trade is defined as a gross domestic product (GDP) minus exports since gross output data is not available for most EU candidate countries and new EU applicants.

A lower TC value (closer to 1) indicates stronger trade integration and better connectivity, while a higher TC value (above 2) reflects weaker connectivity and greater barriers to trade.

Figure 5.2 illustrates the pattern of connectivity between the EU, the Western Balkans, and China, which serves as the principal trade and investment partner in this analysis.

Figure 5.2: Trends in Trade Costs between EU, Western Balkans, and China



Source: calculated based on the paper by Novy (2011)

As illustrated in Figure 5.2, based on four-year averages, the difference in trade costs between China and the EU was the largest during the period 2004–2008, showing a decline of 23% relative to the initial value. In contrast, the greatest variation in trade costs between the EU and the Western Balkans occurred during 2008–2012, with a reduction of 44% relative to the initial value. Indeed, following the EU enlargements, trade costs decreased, leading to a shift in the European FDI landscape toward the new EU member states. Similarly, in 2008–2012, when trade costs dropped significantly, countries such as Albania, Montenegro, and Serbia applied for EU membership. Preliminary results suggest that EU membership is a key determinant of improved connectivity in Europe. Besides this, the drop in trade costs between China and the Western Balkans also reflects the Belt and Road Initiative (BRI), adopted in 2013.

This result is supported by trade theory, which states that decreased trade costs should increase integration. To understand whether the change in trade costs and connectivity can serve as a proxy for the level of EU integration and determine the volume of FDI, we estimate our model by adding trade cost indices and including fixed and random effects. To distinguish country-specific effects, we first estimate both Fixed Effects (FE) and Random Effects (RE) models for all groups of countries. The FE model assumes that individual country characteristics are invariant over time, while the RE model assumes that individual effects are random and uncorrelated with the regressors. We then perform the Hausman test to determine whether the RE assumption holds. Finally, to control for policy changes, time effects are included. After these estimation steps, Table 5.2 shows that for EU-28 and EU-13, both RE and FE are consistent, but RE is efficient, whereas for the Western Balkans, FE is efficient.

Table 5.2: Fixed and Random Effects Panel Estimation of FDI Determinants

Model	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Estimator	RE	FE	RE	FE	RE	FE	RE	FE
Sample	All selected countries		EU-28		EU-13		WB	
Dep. var.	*lnFDI*		*lnFDI*		*lnFDI*		*lnFDI*	
lnGDP	0.6783**	1.8020	0.6469**	3.0004*	0.8179**	2.0389	0.8404**	-0.3164
	(0.1343)	(1.2802)	(0.1359)	(1.4746)	(0.0954)	(1.8883)	(0.1855)	(2.7303)
lnGDPP	0.1538	-1.0332	0.0936	-2.1401	-0.5801*	-0.5251	0.4983	0.3420
	(0.2204)	(1.2610)	(0.2602)	(1.4571)	(0.2391)	(1.8426)	(0.4589)	(2.8822)
ULC	-0.0001	0.0013	-0.0008	0.0021	0.0006	0.0019	-0.3278**	0.3862
	(0.0002)	(0.0014)	(0.0008)	(0.0016)	(0.0006)	(0.0019)	(0.1092)	(0.4887)
HCapital	-0.1286	-0.0696	-0.4680	-0.4413	-0.3018	-0.3060	0.5140^{+}	0.2594
	(0.2455)	(0.2923)	(0.3164)	(0.3979)	(0.3952)	(1.0481)	(0.2852)	(0.3032)
TC	-0.2503**	-0.2553**	-0.6900*	-0.1528	0.9442**	-0.0711	-0.1473*	-0.2389**
	(0.0836)	(0.0872)	(0.2824)	(0.3089)	(0.2619)	(0.3208)	(0.0736)	(0.0793)
OFDIChi	-0.2383**	-0.2494**	-0.1906*	-0.2278**	-0.2127^{+}	-0.1978	-0.5275**	-0.2695^{+}
	(0.0634)	(0.0728)	(0.0775)	(0.0866)	(0.1185)	(0.1335)	(0.1570)	(0.1498)
Ports	0.0772^{+}	0.0802^{+}	0.0561	0.0653	-0.1288^{+}	-0.1317^{+}	0.1411^{+}	0.0908
	(0.0451)	(0.0459)	(0.0536)	(0.0543)	(0.0704)	(0.0715)	(0.0794)	(0.0765)
Internet	0.3539**	0.3439**	0.2705	0.3247	0.5344*	-0.0976	0.3157*	0.5819**
	(0.0991)	(0.1047)	(0.1967)	(0.2111)	(0.2246)	(0.2538)	(0.1240)	(0.1239)
HiTech	0.0059	-0.0002	-0.0021	-0.0086	0.0339*	0.0157	0.0573**	0.0260
	(0.0124)	(0.0141)	(0.0144)	(0.0169)	(0.0150)	(0.0192)	(0.0222)	(0.0218)
EU	-0.1975	-0.1307	-0.2230	0.0238	0.2136	0.2970	0.0685	-0.4869^{+}
	(0.1629)	(0.1743)	(0.2261)	(0.2409)	(0.2228)	(0.2314)	(0.2169)	(0.2470)
BRI	-0.2173^{+}	-0.0934	-0.1825	0.1147	-0.4699*	-0.1795	-0.2749	-0.3227
	(0.1313)	(0.1449)	(0.1586)	(0.1799)	(0.1860)	(0.2052)	(0.2192)	(0.2096)
ICT	0.0056	-0.0062	0.0123	-0.0052	0.0012	-0.0123	0.1850	-0.5229*
	(0.0103)	(0.0125)	(0.0121)	(0.0136)	(0.0117)	(0.0142)	(0.1853)	(0.2457)
Railway	-0.0517	0.1389	-0.0976	0.2501	-0.1212*	0.8283**	-0.1454*	-0.0213
	(0.0731)	(0.1513)	(0.0817)	(0.2092)	(0.0484)	(0.2865)	(0.0630)	(0.1877)
_cons	9.1285**	-11.3119	13.1828**	-33.8846	2.4805**	-27.7404	7.6480	29.1815
	(2.4004)	(20.7775)	(3.8521)	(24.5990)	(3.5370)	(31.8053)	(4.6509)	(40.2283)
N	606	606	498	498	229	229	108	108
r2		0.1380		0.1159		0.2856		0.5044

Source: Author's elaboration.
Note: Standard errors (clustered by country) are in parentheses. + $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.

As seen from columns (1)–(8) of Table 5.2, incorporating trade costs and, importantly, controlling for fixed effects makes it possible to capture a significant part of country-specific factors that may influence FDI. Focusing on the impact of changes in trade costs *(TC)* on FDI, the coefficient *TC* shows a consistently strong negative and significant effect across all groups of selected countries. This confirms that trade costs *(TC),* among other factors, are one of the main relevant determinants of FDI inflows to Europe.

The negative relationship between trade costs and FDI is stronger for EU-13 than for the Western Balkans (WB) in terms of the magnitude of the effect (for WB: –0.2389; for EU-13: –0.9442). In practical terms, a 10% decrease in trade costs *(TC)* between the New Member States *(NMS)* and *China* is associated with a 9.4% increase in FDI for EU-13, compared to a 2.4% increase for the *Western Balkans*. The six Western Balkan countries have correspondingly higher trade costs with China than the EU average.

Consistent with this pattern, the negative coefficient of *OFDIChi* for the Western Balkans is larger than for EU-13, indicating that an increase in Chinese outward FDI is associated with a reduction in total FDI inflows. This may reflect a partial crowding-out effect of Chinese investment on other sources, while extensive supply chains and access to external markets, supported by improved connectivity, continue to create incentives for the Western Balkans to pursue further integration.

Additionally, reductions in trade costs could influence FDI through specific FDI motives and strategies. While high trade costs may motivate firms to replicate production across countries (horizontal FDI), decreases in trade costs allow firms to better exploit differences in factor endowments (vertical or complex FDI). In our case, the negative coefficient of *TC*, among other variables, supports the predictions of the KC model for EU-28 and vertical FDI for EU-13.

The Western Balkans tend to facilitate vertical and export-platform FDI. While the profitability of vertical FDI clearly increases as trade costs fall, the relationship for export-platform FDI is more ambiguous in the region. Nevertheless, investors, particularly from China, generally aim to serve not just a single country but the entire EU market.

Importantly, by incorporating *TC* into our specification, the variables for EU membership *(EU)* and participation in the BRI *(BRI)* became statistically significant. Specifically, the coefficient for *EU* (column 8 in Table 5.2) is significant for the Western Balkans, while *BRI* (column 5 in Table 5.2) is highly correlated with EU-13 FDI. This reaffirms the importance of trade costs *(TC)* and connectivity in determining integration processes and FDI inflows to the selected countries.

The negative sign of the EU variable can be explained by the fact that EU enlargement has been driven more by trade integration than by FDI inflows. Regarding China's Belt and Road Initiative *(BRI),* the negative coefficient indicates higher participation risks, as the initiative is primarily associated with infrastructure investment rather than direct investment flows. Although the estimated effects of EU membership and BRI participation on FDI are mixed, they remain consistent with findings in the recent literature (Bruno et al., 2017; Chen and Lin, 2018; Welfens and Baier, 2018; Smarzynska and Wei, 2000).

Overall, the analysis demonstrates that Europe and China are closely interconnected through trade and FDI. Strengthening ties with China appears most feasible for the EU-13 and Western Balkans but may come at the expense of weaker investment relations with more developed EU economies.

To measure connectivity, similar to trade costs, we observe significant regional differences in the quality of physical infrastructure (ports, railways) as well as in the adequacy of digital infrastructure (Internet, ICT, high technology). Infrastructure quality is found to be important: the results show a significant and positive relationship between port quality (*Ports)* and FDI inflows in the Western Balkans, and between railway quality *(Railway)* and FDI in the EU-13. Clearly, countries with higher railway indices and better ports tend to attract a greater volume of FDI. For instance, as shown in Table 5.2, improving railway quality by 10% in the EU-13 is associated with a 1% increase in FDI flows. Similarly, for the Western Balkans, improving port quality by 10 points is associated with a 2% increase in FDI.

FDI involves not only the flow of goods but also the flow of information; hence, there is an important interplay between investment flows and the exchange of ideas and know-how (Jungbluth, 2019). High technology (*HiTech*), technological progress, and communication services *(ICT),* together with the availability of *Internet* infrastructure, create a strong platform for investment. Indeed, increasing *Internet* traffic by 10% across all selected countries results in a 3.5% increase in FDI flows, confirming the positive effect of digital connectivity on FDI.

As expected, all significant infrastructure indicators *(Ports, Railway, Internet, ICT, and HiTech)* tend to be lowest for the NMS and Western Balkans. Comparing these countries with the EU-28, we observe that while the average infrastructure quality in the NMS and Western Balkans remains below that of high-income EU members, it may serve as a key determinant of participation in the BRI.

5.4 Conclusions and Policy Implications

Determinants of FDI in Europe vary across countries and change in nature over time. Since several countries have become new EU member states or candidate countries, FDI has increased sharply, making EU membership a particularly important determinant of FDI. However, BRI participation did not immediately translate into higher inflows. Many less developed European economies—particularly in the Western Balkans and Eastern Europe—already exhibited structural weaknesses such as small market size, weaker institutions, and higher investment risk. Consequently, the negative association with BRI participation reflects these pre-existing conditions rather than the direct effect of the initiative. Moreover, much of the BRI-related engagement took the form of infrastructure loans and public projects rather than private FDI, delaying measurable investment gains. Over time, however, these improvements in physical and digital connectivity may lay the groundwork for stronger and more diversified FDI inflows. Building on existing studies, this research formulates and estimates an FDI model with a focus on Chinese influence in Europe, grouping advanced EU countries, new member states, and Western Balkan countries, while distinguishing between the impacts of EU and BRI membership on FDI.

The EU, as a large and developed market, has long attracted China—initially as a new market for horizontal FDI and, more recently, as a combination of horizontal and vertical models under the Knowledge-Capital framework. With EU enlargement, the new member states have become attractive to Chinese investors as gateways to developed EU economies. The Western Balkans, as candidate and neighboring countries, serve both as export-oriented markets and as pre-entry destinations to the EU (complex vertical or export-oriented FDI).

Using panel data covering 34 countries over the period 2000–2019—which together account for 89% of all European FDI—the analysis confirms the importance of EU membership and BRI participation as key determinants of FDI, driven by reductions in trade costs and improvements in connectivity.

Connectivity represents a modern mechanism for advancing influence through FDI. Comparing trade cost indices calculated annually for 34 countries and their partners over 2000–2019, the analysis indicates that intra-EU trade costs declined following the 2004 and 2007 enlargements. While Figure 5.2 shows aggregated trade costs for the EU and Western Balkans, regression results suggest that trade costs in the NMS are generally lower than in other regions, supporting stronger connectivity effects on FDI. For the Western Balkans, trade costs with China remain relatively higher than with the EU, although they have declined since 2013 following the implementation of the BRI.

Higher and persistent trade costs between China and the Western Balkans likely make these countries more reliant on FDI to facilitate trade. The steady decline in trade costs with the EU reduces trade barriers, potentially shifting the nature of FDI from market-seeking (to bypass costs) toward efficiency- or strategic-seeking investments.

By incorporating trade costs into the baseline empirical model, the study demonstrates that trade costs reflect the degree of European integration among EU and candidate countries, as well as among BRI participants. At the same time, they provide a measure of Chinese influence and the efficiency of the BRI in Europe. Specifically, if a country effectively utilizes BRI funds to improve infrastructure, it can further enhance its attractiveness to FDI.

Chinese influence in the new EU member states is felt more strongly than in other parts of Europe. This indicates that the negative relationship between trade costs and FDI is stronger for the EU-13 than for the Western Balkans. Consequently, the new EU markets appear more attractive for Chinese infrastructure investment than the Western Balkans.

Overall, the analysis shows that Europe and China are closely interconnected through trade and FDI. This suggests that stronger ties with China can be achieved for the EU-13 and the Western Balkans, though possibly at the expense of relations with more developed EU countries.

The results are of particular importance for policymakers, as changes in FDI determinants require the adaptation of public policies in the affected countries. Although richer countries are generally more attractive for FDI, they also face higher transportation and trade costs. In this context, countries seeking to attract more FDI would benefit from developing infrastructure, enhancing production capacity, and improving connectivity.

Appendix C

Table C1: Explanatory Variables and Their Definitions

Variable	Description
lnGDP	Country-specific nominal GDP (logarithmic form, million USD). Source: World Bank Data.
lnGDPP	GDP per capita (logarithmic form, based on purchasing power parity, million USD). Source: World Bank Data.
ULC	Average annual hours worked by persons engaged (hours). Source: PWT 10.0.
HCapital	Human capital index, based on average years of schooling and an assumed rate of return to education. Source: PWT 10.0.
OFDIChi	Chinese investment (logarithmic form), net FDI inflows from China (million USD). Source: World Bank Data.
Ports	Quality of ports, ranging from 1 (extremely underdeveloped) to 7 (well developed and efficient by international standards). Source: World Bank Data.
Internet	Individuals using the Internet (logarithmic form), % of population. Source: World Bank Data.
EU	EU membership: dummy variable equal to 1 if the country is in the EU, 0 otherwise. Source: EU official website.
BRI	BRI membership: dummy variable equal to 1 if the country has joined the Belt and Road Initiative by signing a Memorandum of Understanding with China, 0 otherwise. Source: The Belt and Road Portal.
Openness	Trade openness: sum of exports and imports of goods and services as a share of GDP (%). Calculated by author based on World Bank Data. Formula: $Openness = \frac{(Export+Import)}{GDP} \times 100$ %.
ICT	Information and communication technology exports (% of total goods exports), including computers, peripheral equipment, communication equipment, and other information technologies. Source: World Bank Data.
Railway	Railway goods transported (logarithmic form), million ton-km. Source: World Bank Data.
HiTech	High-technology exports (% of manufactured exports). Source: World Bank Data.
TC	Indices of total trade costs for selected countries, calculated based on Novy (2011).

Source: aggregate variables are taken from the official datasets; resulting variables calculated by author.

References

Adedoyin, F.F., Bekun, F.V., Driha, O.M. & Balsalobre-Lorente, D. (2020). The effects of air transportation, energy, ICT and FDI on economic growth in the industry 4.0 era: Evidence from the United States. *Technological Forecasting & Social Change*, 160, 120297. https://doi.org/10.1016/j.techfore.2020.120297

Aiyar, S., Malacrino, D., & Presbitero, A. F. (2024). Investing in friends: The role of geopolitical alignment in FDI flows. *European Journal of Political Economy*, 83, 102508. https://doi.org/10.1016/j.ejpoleco.2024.102508

Anderson, J. E., & Van Wincoop, E. (2003). Gravity with gravitas: A solution to the border puzzle. *American Economic Review*, 93(1), 170–192. https://doi.org/10.1257/000282803321455214

Anderson, J.E., & Wincoop, E. (2004). Trade Costs. *Journal of Economic Literature*, 42(3), 691–751. https://doi.org/10.1257/0022051042177649

Anderson, J., Larch, M., & Yotov, Y. (2017). Trade and investment in the global economy. *CESifo Working Paper Series* No. 6625. Retrieved from https://ssrn.com/abstract=3038677

Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277–297. https://doi.org/10.2307/2297968

Arvis, J.-F., & Shepherd, B. (2011). The Air Connectivity Index: Measuring Integration in the Global Air Transport Network. *Policy Research Working Paper*, WPS 5722. World Bank. Retrieved from https://openknowledge.worldbank.org/handle/10986/3486

Arvis, J.-F., Duval, Y., Shepherd, B., & Utoktham, Ch. (2016). Trade Costs in the Developing World: 1996 – 2010. *World Trade Review*, 15(3), 451–474. https://doi.org/10.1017/S147474561500052X

Asiedu, E. (2002). On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different? *World Development*, 30(1), 107–119. https://doi.org/10.1016/S0305-750X(01)0100-0

Asiedu, E. (2006). Foreign Direct Investment in Africa: The Role of Natural Resources, Market Size, Government Policy, Institutions and Political Instability. *The World Economy*, 29(1), 63–77. https://doi.org/10.1111/j.1467-9701.2006.00758.x

Baier, S., & Bergstrand, J. H. (2007). Do free trade agreements actually increase members' international trade? Journal of International Economics, 71(1), 72–95. https://doi.org/10.1016/j.jinteco.2006.02.005

Baier, S., Yotov, Y., & Zylkin, T. (2019). On the widely differing effects of free trade agreements: Lessons from twenty years of trade integration. Journal of International Economics, 116, 206–226. https://doi.org/10.1016/j.jinteco.2018.11.002

Bailey, N. (2018). Exploring the relationship between institutional factors and FDI attractiveness: A meta-analytic review. International Business Review, 27(1), 139–148. https://doi.org/10.1016/j.ibusrev.2017.05.012

Bakar, N., Che Mat, C. H., & Harun, M. (2012). The impact of infrastructure on foreign direct investment: The case of Malaysia. Procedia – Social and Behavioral Sciences, 65, 205–211. https://doi.org/10.1016/j.sbspro.2012.11.112

Baldwin, E., Forslid, R., & Haaland, J. (1996). Investment creation and diversion in Europe. The World Economy, 19(6), 635–659. https://doi.org/10.1111/j.1467-9701.1996.tb00704.x

Baltagi, B., Egger, H., & Pfafermayr, M. (2007). Estimating regional trade agreement effects on FDI in an interdependent world. Journal of Econometrics, 145(1–2), 194–208. https://doi.org/10.2139/ssrn.1809094

Beltramo, T. (2010). Changes in bilateral trade costs between European Union member states and major trading partners: An empirical analysis from 1989–2006. MPRA Paper 24259. University Library of Munich, Germany. Retrieved from https://mpra.ub.uni-muenchen.de/24259

Bergstrand, J., & Egger, P. (2007). A knowledge-and-physical-capital model of international trade flows, foreign direct investment, and multinational enterprises. Journal of International Economics, 73(2), 278–308. https://doi.org/10.1016/j.jinteco.2007.03.004

Bergstrand, J. H., & Paniagua, J. (2024). Do deep trade agreements' provisions actually increase – or decrease – trade and/or FDI? CESifo Working Paper No. 11526. https://dx.doi.org/10.2139/ssrn.5054265

Bergstrand, J. H., Larch, M., & Yotov, Y. (2015). Economic integration agreements, border effects, and distance elasticities in the gravity equation. European Economic Review, 78, 307–327. https://doi.org/10.1016/j.euroecorev.2015.06.003

Bevan, A., & Estrin, S. (2004). Foreign investment location and institutional development in transition economies. International Business Review, 13(1), 43–64. https://doi.org/10.1016/j.ibusrev.2003.05.005

Blonigen, B. A. (2005). A review of the empirical literature on FDI determinants. Atlantic Economic Journal, 33(4), 383–403. https://doi.org/10.1007/s11293-005-2868-9

Blonigen, B. A., Davies, R. B., Waddell, G. R., & Naughton, H. T. (2007). FDI in space: Spatial autoregressive relationships in foreign direct investment. European Economic Review, 51(5), 1303–1335. https://doi.org/10.1016/j.euroecorev.2006.08.006

Blonigen, B. A., & Piger, J. (2014). Determinants of foreign direct investment. Canadian Journal of Economics, 47(3), 775–812. https://doi.org/10.1111/caje.12091

Boeckelmann, L., Emter, L., Moder, I., Pongetti, G., & Spital, T. (2024, May). Geopolitical fragmentation in global and euro area greenfield foreign direct investment. ECB

Economic Bulletin, Box 7/2024. European Central Bank. Retrieved from https://www.ecb.europa.eu/press/economic-bulletin/focus/2024/html/ecb.ebbox202407_01~f5d9608296.en.html

Bontadini, F., Meliciani, V., Savona, M., & others. (2025). Nearshoring and farsharing in Europe within the global economy: Regional trends, structural components and sectoral patterns. Journal of Industrial and Business Economics, 52, 559–597. https://doi.org/10.1007/s40812-025-00361-4

Borrmann, C., Jungnickel, R., & Keller, D. (2005). What gravity models can tell us about the position of German FDI in Central and Eastern Europe. HWWA Discussion Papers No. 328. Hamburg Institute of International Economics. Retrieved from https://www.econstor.eu/bitstream/10419/19296/1/328.pdf

Brainard, S. (1997). An empirical assessment of the proximity-concentration trade-off between multinational sales and trade. American Economic Review, 87(4), 520–544. Retrieved from http://www.jstor.org/stable/2951362

Brakman, S. (2008). Foreign Direct Investment and the Multinational Enterprise. Cambridge, MA: MIT Press. https://mitpress.mit.edu/books/foreign-direct-investment-and-multinational-enterprise

Bruno, R., Campos, N., Estrin, S., & Tian, M. (2017). Economic integration, foreign investment and international trade: The effects of membership of the European Union. CEP Discussion Paper No. 1518. Centre for Economic Performance, LSE. https://doi.org/10.1111/jcms.13131

Bruno, R. L., Campos, N. F., & Estrin, S. (2020). The effect on foreign direct investment of membership in the European Union. IZA Discussion Paper No. 13668. Institute of Labor Economics (IZA). Retrieved from https://ftp.iza.org/dp13668.pdf

Buchan, N., Fatas, E., & Grimalda, G. (2012). Connectivity and cooperation. In R. Croson & G. Bolton (Eds.), The Oxford Handbook of Economic Conflict Resolution (pp. 155–182). Oxford: Oxford University Press.

Camarero, M., Moliner, S., & Tamarit, C. (2024). A fresh assessment of the depth of the “Euro Effect” on US FDI (Single Market Economics Papers WP2024/18). Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Chief Economist Team, European Commission. Retrieved from https://ec.europa.eu/docsroom/documents/58034/attachments/1/translations/en/renditions/native

Campos, N., & Kinoshita, Y. (2008). Foreign direct investment and structural reforms: Evidence from Eastern Europe and Latin America. William Davidson Institute Working Paper No. 906. Retrieved from https://econpapers.repec.org/RePEc:wdi:papers:2008-906

Canh, N. P., Binh, N. T., Thanh, S. D., & Schinckus, C. (2020). Determinants of foreign direct investment inflows: The role of economic policy uncertainty. International Economics, 161(C), 159–172. https://doi.org/10.1016/j.inteco.2019.11.012

Cardamone, P., & Scoppola, M. (2012). Trade costs and the pattern of foreign direct investment: Evidence from five EU countries. First AIEAA Congress, June 4–5, 2012, Trento, Italy (Paper No. 123993). Italian Association of Agricultural and Applied Economics (AIEAA). https://doi.org/10.22004/ag.econ.123993

Carr, D. L., Markusen, J. R., & Maskus, K. E. (2001). Estimating the Knowledge-Capital model of the multinational enterprise. American Economic Review, 91(3), 693–708. https://doi.org/10.1257/aer.91.3.693

Casarini, N. (2024). The future of the Belt and Road in Europe: How China's connectivity project is being reconfigured across the Old Continent – and what it means for the Euro-Atlantic Alliance. IAI Papers, Issue 24 (02). Rome: Istituto Affari Internazionali. Retrieved from https://www.iai.it/sites/default/files/iaip2402.pdf

Castelli, C., Davies, R. B., Ghodsi, M., & Flórez Mendoza, J. (2025). Drivers of FDI in the EU: Regulatory distance and revealed technological advantage. wiiw Research Report. Retrieved from https://wiiw.ac.at/drivers-of-fdi-in-the-eu-regulatory-distance-and-revealed-technological-advantage-dlp-7343.pdf

Chen, M. X., & Lin, C. (2018). Foreign investment across the Belt and Road: Patterns, determinants, and effects (Policy Research Working Paper No. 8607). World Bank. Retrieved from https://openknowledge.worldbank.org/handle/10986/30577

Chen, N., & Novy, D. (2022). Gravity and heterogeneous trade cost elasticities. The Economic Journal, 132(644), 1349–1377. https://doi.org/10.1093/ej/ueab067

Cicak, K., & Soric, P. (2015). The interrelationship of FDI and GDP in European transition countries. International Journal of Management Science and Business Administration, 1(4), 41–58. Retrieved from https://researchleap.com/wp-content/uploads/2015/03/3.-The-Interrelationship-of-FDI-and-GDP-in-European-Transition-Countries.pdf

Cieslik, A. (2017). Determinants of MNE activity in Poland: The case of firms from EU-15. Entrepreneurial Business and Economics Review, 5(1), 151–167. https://doi.org/10.15678/EBER.2017.050109

Cieslik, A. (2019). What attracts multinational enterprises from the new EU member states to Poland? Eurasian Business Review, 9(3), 339–355. https://doi.org/10.1007/s40821-019-00122-z

Conte, M., Cotterlaz, P., & Mayer, T. (2022). The CEPII Gravity Database (CEPII Working Paper No. 2022-05). CEPII. Retrieved from https://www.cepii.fr/PDF_PUB/wp/2022/wp2022-05.pdf

Contessi, C., & Weinberger, A. (2009). Foreign direct investment, productivity, and country growth: An overview. Federal Reserve Bank of St. Louis Review, 91(2), 61–78. Retrieved from
https://files.stlouisfed.org/files/htdocs/publications/review/09/03/Contessi.pdf

Davies, R. B. (2003). Tax treaties, renegotiations, and foreign direct investment. Economic Analysis and Policy, 33(2), 251–273. https://doi.org/10.1016/S0313-5926(03)50020-0

Dellis, K., Sondermann, D., & Vansteenkiste, I. (2017). Determinants of FDI inflows in advanced economies: Does the quality of economic structures matter? ECB Working Paper No. 2066. Retrieved from https://ssrn.com/abstract=2990996

Derudder, B., Liu, X., & Kunaka, C. (2018). Connectivity along overland corridors of the Belt and Road Initiative. MTI Global Practice Discussion Paper No. 6, World Bank, Washington, DC. Retrieved from
https://openknowledge.worldbank.org/handle/10986/30609

Dunning, J. H. (1977). Trade, location of economic activity and the MNE: A search for an eclectic approach. In The international allocation of economic activity (pp. 395–418). Palgrave Macmillan, London. https://doi.org/10.1007/978-1-349-03196-2_38

Dunning, J.H., Lundan, S.M. (2008). Institutions and the OLI paradigm of the multinational enterprise. Asia Pacific Journal of Management, 25, 573–593. https://doi.org/10.1007/s10490-007-9074-z

Duval, Y., & Utoktham, C. (2014). Impact of trade facilitation on foreign direct investment. ESCAP Trade and Investment Division, TID Working Paper No. 04/14. Retrieved from http://www.unescap.org/publications

Egger, P., & Pfaffermayr, M. (2004). Foreign direct investment and European integration in the 1990s. *The World Economy, 27*(1), 99–110.
https://doi.org/10.1111/j.1467-9701.2004.00590.x

Eicher, T. S., Helfman, L., & Lenkoski, A. (2011). Robust FDI determinants: Bayesian model averaging in the presence of selection bias. Journal of Macroeconomics, 34(3), 637–651. http://dx.doi.org/10.2139/ssrn.2054934

Ekholm, K., Forslid, R., & Markusen, J. R. (2007). Export-platform foreign direct investment. Journal of the European Economic Association, 5(4), 776–795. https://doi.org/10.1162/JEEA.2007.5.4.776

Ercegovac, D., & Pucar, E. B. (2022). The nexus between FDI and external balance in selected emerging European economies – a panel data approach. The Annals of the Faculty of Economics in Subotica, 58(47), 147–164. https://doi.org/10.5937/AnEkSub2247147E

European Commission. (2021). First annual report on the screening of foreign direct investments into the Union, SWD(2021) 334 final. Retrieved from https://trade.ec.europa.eu/doclib/docs/2021/november/tradoc_159940.pdf

Feenstra, Robert C., Robert Inklaar, and Marcel P. Timmer. (2015). "The Next Generation of the Penn World Table." American Economic Review, 105(10), 3150–3182. Retrieved from https://www.rug.nl/ggdc/productivity/pwt/pwt-releases/pwt100?lang=en&utm_source=chatgpt.com

Fletcher, K., Grimm, V., Kroeger, T., Mineshima, A., Ochsner, C., Presbitero, A. F., Schmidt-Engelbertz, P., & Zhou, J. (2024). Germany's foreign direct investment in times of geopolitical fragmentation. https://doi.org/10.5089/9798400279942.001

Ghodsi, M. (2019). How do technical barriers to trade affect foreign direct investment? The Vienna Institute for International Economic Studies (wiiw) Working Paper No. 160. Retrieved from http://hdl.handle.net/10419/204025

Gould, D. M., Kenett, D. Y., & Panterov, G. (2021). Multi-dimensional economic connectivity: Benefits, risks, and policy implications. International Journal of Finance & Economics, 26(4), 6110–6127. https://doi.org/10.1002/ijfe.2111

Grieveson, R., Holzner, M., & Vukšić, G. (2021). Regional economic cooperation in the Western Balkans: The role of stabilization and association agreements, bilateral investment treaties and free trade agreements in regional investment and trade flows. Eastern European Economics, 59(1), 3–24.
https://doi.org/10.1080/00128775.2020.1846130

Gupta, V. (2017). Exploring the relation between human capital and foreign direct investment: Indian context. Journal of Industrial Statistics, 6(1), 89–107.

Harding, T., & Javorcik, B. S. (2012). Foreign direct investment and export upgrading. Review of Economics and Statistics, 94(4), 964–980. https://doi.org/10.1162/REST_a_00226

Helpman, E. (1984). A simple theory of international trade with multinational corporations. Journal of Political Economy 92(3): 451-471. https://doi.org/10.1086/261236

Helpman E., (2006). Trade, FDI, and the Organization of Firms, Journal of Economic Literature, 44(3), 589-630. https://doi.org/10.3386/w12091

Helpman, E. (2008). Understanding global trade. Cambridge, MA: Harvard University Press.

Herman, P. R. (2023). Gravity estimation: Best practices and useful approaches (Economics Working Paper No. 2023-10-C). U.S. International Trade Commission. Retrieved from
https://www.usitc.gov/publications/332/working_papers/herman_gravity_estimation_practices_2023.pdf

Hunady, J., & Orviska, M. (2014). Determinants of foreign direct investment in EU countries – Do corporate taxes really matter? Procedia Economics and Finance, 12, 243–250. https://doi.org/10.1016/S2212-5671(14)00341-4

Ito, T. (2013). Export-platform foreign direct investment: Theory and evidence. The World Economy, 36(5), 590–606. https://doi.org/10.1111/twec.12040

Jirasavetakul, L., & Rahman, J. (2018). Foreign direct investment in new member states of the EU and Western Balkans: Taking stock and assessing prospects. IMF Working Paper No. 18/187. https://doi.org/10.5089/9781484373323.001

Jungbluth, C. (2019). Tracing three decades of foreign direct investment booms and busts and their recent decline. Blog Global Economic Dynamics. Retrieved from https://ged-project.de/allgemein-en/foreign-direct-investment/

Kahn, M. E., Liao, W.-C., & Zheng, S. (2024). How the US-China trade war accelerated urban economic growth and environmental progress in Northern Vietnam (NBER Working Paper No. 33126). National Bureau of Economic Research. http://www.nber.org/papers/w33126

Kano, L., & Oh, C. H. (2020). Global value chains in the post-COVID world: Governance for reliability. Journal of Management Studies, 57(8), 1773–1777. https://doi.org/10.1111/joms.12626

Kastratović, R. (2020). The impact of foreign direct investment on host country exports: A meta-analysis. The World Economy, 43(12), 3142–3183. https://doi.org/10.1111/twec.13011

Kaushal, L. A. (2021). Impact of institutional and regulatory quality on FDI inflow: Case of a developing Indian economy. Cogent Economics & Finance, 9(1), 1985201. https://doi.org/10.1080/23322039.2021.1985201

Kaya, A., & De Haan, J. (2022). Capital flows, EU integration and the global financial crisis: An empirical analysis. Journal of Applied Economics, 25(1), 1025–1049. https://doi.org/10.1080/15140326.2022.2099726

Kox, H. L. M., & Rojas-Romagosa, H. (2020). How trade and investment agreements affect bilateral foreign direct investment: Results from a structural gravity model (KVL Discussion Paper No. 2020-02). Den Bosch, Netherlands: KVL. https://doi.org/10.2139/ssrn.3667034

Kratz, A., Zenglein, M. J., Mischer, A., Sebastian, G., & Meyer, A. (2025). Chinese investment rebounds despite growing frictions: Chinese FDI in Europe – 2024 update. Rhodium Group & Mercator Institute for China Studies (MERICS). https://merics.org/sites/default/files/2025-05/MERICS-Rhodium-Group-COFDI-Update-2025_FINAL_0.pdf

Kripfganz, S. (2020). Generalized method of moments estimation of linear dynamic panel-data models. 2020 Stata Conference 14, Stata Users Group. Retrieved from https://www.stata.com/meeting/us20/slides/us20_Kripfganz.pdf

Larch, M., & Yotov, Y. V. (2025). Deep trade agreements and FDI in partial and general equilibrium: A structural estimation framework. The World Bank Economic Review, 39(2), 281–307. https://doi.org/10.1093/wber/lhae031

Larch, M., Shikher, S., & Yotov, Y. V. (2025). Estimating gravity equations: Theory implications, econometric developments, and practical recommendations (Working Paper No. 2025-001). Center for Global Policy Analysis, LeBow College of Business, Drexel University. Retrieved from https://www.lebow.drexel.edu/sites/default/files/2025-01/wp2025001-gravity-equations.pdf

Liu, L., Gozgor, G., Mahalik, M. K., & Pal, S. (2025). The impact of the US–China tensions on FDI dynamics in emerging economies. Finance Research Letters, 78, 107255. https://doi.org/10.1016/j.frl.2025.107255

MacDougall, G. D. A. (1960). The benefits and costs of private investment from abroad: A theoretical approach. The Economic Record, 36(73), 13–35. https://doi.org/10.1111/j.1475-4932.1960.tb00491.x

Mangla, S. K., & Yang, C.-H. (2025). Spillover effects of foreign direct investment on firms' exports: Evidence from India. The World Economy. https://doi.org/10.1111/twec.13719

Markusen, J. R. (1984). Multinationals, multi-plant economies, and the gains from trade. Journal of International Economics, 16(3-4), 205–226. https://doi.org/10.1016/S0022-1996(84)80001-X

Markusen, J. R. (2000). Foreign direct investment (CIES Working Paper No. 19). University of Colorado at Boulder – Department of Economics; Centre for Economic Policy Research (CEPR); National Bureau of Economic Research (NBER). http://dx.doi.org/10.2139/ssrn.231202

Markusen, J. R. (2013). Multinational firms. In D. Bernhofen, R. Falvey, D. Greenaway, & U. Kreickemeier (Eds.), Palgrave Handbook of International Trade (pp. 236–262). Basingstoke: Palgrave Macmillan. https://link.springer.com/chapter/10.1007/978-0-230-30531-1_8

Martinez-San Roman, V., Bengoa-Calvo, M., & Sanchez-Robles, B. (2012). Foreign direct investment and trade: Complements or substitutes? Empirical evidence for the European Union. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2062223

Maurseth, P. B., Masso, J., & Holmen, R. B. (2025). FDI and trade for foreign market entry: Theory and evidence from Estonia. *Baltic Journal of Economics, 25*(1), 39–71. https://doi.org/10.1080/1406099X.2025.246386

Meinhart, B. (2024). How EU membership affects foreign direct investment: Differences between EU15 and CEE countries. The World Economy, 47(5), 2194–2218. https://doi.org/10.1111/twec.13541

Mistura, F., & Roulet, C. (2019). The determinants of foreign direct investment: Do statutory restrictions matter? OECD Working Papers on International Investment, 2019/01. OECD Publishing. Retrieved from https://ideas.repec.org/p/oec/dafaaa/2019-01-en.html

Mundell, R. (1957). International trade and factor mobility. The American Economic Review, 47(3), 321–335.

Nedopil Wang, C. (2025). China Belt and Road Initiative (BRI) Investment Report 2024. Green Finance & Development Center, FISF Fudan University. https://greenfdc.org

National Statistical Committee of the Republic of Belarus. (2025). Belarus in figures: Statistical reference book. Minsk: National Statistical Committee of the Republic of Belarus. Retrieved from https://belstat.gov.by/upload/iblock/693/gtq6numu2m994wytynvkh7idnp4qwaee.pdf

Novy, D. (2011). Gravity Redux: Measuring International Trade Costs with Panel Data. CESifo Working Paper Series No. 3616. Available at SSRN: https://ssrn.com/abstract=1949072

Novy, D. (2013). Gravity redox: Measuring international trade costs with panel data. Economic Inquiry, 51(1), 101–121. https://doi.org/10.1111/j.1465-7295.2011.00439.x

OECD. (2019). OECD Compendium of Productivity Indicators 2019, OECD Publishing, Paris. https://doi.org/10.1787/b2774f97-en.

OECD. (2025). OECD supply chain resilience review: Navigating risks. Paris: OECD Publishing. https://doi.org/10.1787/94e3a8ea-en

Olivero, M., & Yotov, Y. (2012). Dynamic gravity: Endogenous country size and asset accumulation. Canadian Journal of Economics, 45(1), 64–92. https://doi.org/10.1111/j.1540-5982.2011.01687.x

Pain, N. (1993). An econometric analysis of foreign direct investment in the United Kingdom. Scottish Journal of Political Economy, 40(1), 1–23. https://doi.org/10.1111/j.1467-9485.1993.tb00634.x

Palit, A. (2019). Trade and economic connectivity in an age of uncertainty: South Asia and Indo-Pacific. Panorama: Insights into Asian and European Affairs, 113–121. Retrieved from https://www.kas.de/documents/288143/6741384/panorama_trade_AmitenduPalit_TradeandEconomicConnectivityinanAgeofUncertainty_SouthAsiaandIndo-Pacific.pdf/48620d6c-c9dc-8090-9393-e37e429e29e7?t=1564644887447

Pirlogeanu, D. (2017). The determinants of foreign direct investments inflows in G7 countries. Revista Economica, 69(3), 85–93. Retrieved from http://oldeconomice.ulbsibiu.ro/revista.economica/archive/69309pirlogeanu.pdf

Pontes, J. P. (2004). A theory of the relationship between foreign direct investment and trade (ERSA Conference Paper No. ersa04p47). European Regional Science Association. Retrieved from https://www-sre.wu.ac.at/ersa/ersaconfs/ersa04/PDF/47.pdf

Pyun, J. H. (2025). Third-country FDI relocation in response to the US-China tariff war (IDE Discussion Paper No. 954). Institute of Developing Economies, Japan External Trade Organization (JETRO). Retrieved from https://ir.ide.go.jp/records/2001292

Ramanayake, S. (2025). Determinants of foreign direct investment: A comparative analysis of distance factors. South Asian Journal of Finance, 5(1). https://doi.org/10.4038/sajf.v5i1.103

Randelovic, S., & Martinovic, N. (2022). National competitiveness and foreign direct investment in emerging Europe. Economic Themes, 60(1), 21–40. https://doi.org/10.2478/ethemes-2022-0002

Ruta, M. (2022). The impact of the war in Ukraine on global trade and investment. Trade, Investment and Competitiveness; Equitable Growth, Finance and Institutions Insight, World Bank. Retrieved from http://documents.worldbank.org/curated/en/099750104252216595/IDU0008eed66007300452c0beb208e8903183c39

Samina, S., Rafique, A., & Abbas, K. (2019). Institutions and FDI: Evidence from developed and developing countries. Financial Innovation, 5(1), 1–20. https://doi.org/10.1186/s40854-019-0123-7

Santos Silva, J. M. C., & Tenreyro, S. (2006). The log of gravity. Review of Economics and Statistics, 88(4), 641–658. https://doi.org/10.1162/rest.88.4.641

Smarzynska, B. K., & Wei, S.-J. (2000). Corruption and composition of foreign direct investment: Firm-level evidence (Policy Research Working Paper No. 2360). World Bank. Retrieved from https://openknowledge.worldbank.org/bitstream/handle/10986/19836/multi_page.pdf

Sondermann, D., & Vansteenkiste, I. (2019). Did the euro change the nature of FDI flows among member states? (Working Paper Series No. 2275). European Central Bank. Retrieved from https://ideas.repec.org/s/ecb/ecbwps.html

Tamberi, N. (2024). Export-platform foreign direct investment and trade policy uncertainty: Evidence from Brexit. Economica, 91(361), 33–69. https://doi.org/10.1111/ecca.12495

The Belt and Road Portal. (n.d.). Official website promoting Belt and Road cooperation. China Economic Information Service & State Information Center. Retrieved from https://eng.yidaiyilu.gov.cn

Todo, Y., Nishitateno, S., & Brown, S. (2025). The impact of the Belt and Road Initiative on foreign direct investment from China, the United States, and major investor countries. RIETI Discussion Paper Series, 25-E-004. Retrieved from https://www.rieti.go.jp/jp/publications/dp/25e004.pdf

UN Comtrade Database. (2025). UN Comtrade database. United Nations Statistics Division. Retrieved from https://comtrade.un.org/data

UNCTAD. (2024). World investment report 2024: Investment facilitation and digital government. United Nations. https://unctad.org/wir2024

UNCTAD. (n.d.). FDI/MNE database. United Nations Conference on Trade and Development. Retrieved from https://unctad.org/fdistatistics

Vernon, R. (1966). International investment and international trade in the product cycle. The Quarterly Journal of Economics, 80(2), 190–207. https://doi.org/10.2307/1880689

Vidya, C. T., & Taghizadeh-Hesary, F. (2021). Does infrastructure facilitate trade connectivity? Evidence from the ASEAN. Asia Europe Journal, 19(1), 51–75. https://doi.org/10.1007/s10308-021-00614-6

Vidya, C. T., Prabheesh, K. P., & Sirowa, S. (2020). Is trade integration leading to regionalization? Evidence from cross-country network analysis. Journal of Economic Integration, 35(1), 10–38. https://doi.org/10.11130/jei.2020.35.1.10

Welfens, P. J., & Baier, F. (2018). Brexit and foreign direct investment: Key issues and new empirical findings. International Journal of Financial Studies, 6(2), 46–67. https://doi.org/10.3390/ijfs6020046

Wong, K. N., & Tang, T. C. (2011). Foreign direct investment and employment in manufacturing and services sectors: Fresh empirical evidence from Singapore. Journal of Economic Studies, 38(3), 313–330. https://doi.org/10.1108/01443581111152427

World Bank. (2025). World development indicators. The World Bank Group. Retrieved from https://databank.worldbank.org/source/world-development-indicators

World Investment Report. (2018). World Investment Report 2018: Investment and new industrial policies. United Nations Conference on Trade and Development. Retrieved from https://unctad.org/system/files/official-document/wir2018_en.pdf

World Investment Report. (2020). World investment report 2020: International Production Beyond the Pandemic. Geneva: UNCTAD. Retrieved from https://unctad.org/webflyer/world-investment-report-2020

World Investment Report. (2021). World Investment Report 2021: Investing in sustainable recovery. United Nations Conference on Trade and Development. Retrieved from https://unctad.org/en/PublicationsLibrary/wir2021_en.pdf

World Investment Report. (2022). World Investment Report 2022: International tax reforms and sustainable investment. United Nations Conference on Trade and Development. Retrieved from https://unctad.org/system/files/official-document/wir2022_en.pdf

World investment report (2025): International investment in the digital economy. United Nations Conference on Trade and Development.
https://unctad.org/publication/world-investment-report-2025

Yotov, Y. V., Piermartini, R., Monteiro, J. A., & Larch, M. (2016). An advanced guide to trade policy analysis: The structural gravity model. World Trade Organization & United Nations. https://doi.org/10.30875/abc0167e-en

Yu, S., Qian, X., & Liu, T. (2019). Belt and Road Initiative and Chinese firms' outward foreign direct investment. Emerging Markets Review, 41, 100629. https://doi.org/10.1016/j.ememar.2019.100629

Zavarská, Z. (2022). Global value chains in the post-pandemic world: How can the Western Balkans foster the potential of nearshoring? (wiiw Policy Notes and Reports No. 58). The Vienna Institute for International Economic Studies. Retrieved from https://wiiw.ac.at/global-value-chains-in-the-post-pandemic-world-how-can-the-western-balkans-foster-the-potential-of-nearshoring-dlp-6129.pdf