

Dipoo, Riyaad R.; Dikgang, Johane

Working Paper

The Fading Growth Dividend of FDI: Evidence from OECD Economies, 2001-2023

GLO Discussion Paper, No. 1819

Provided in Cooperation with:

Global Labor Organization (GLO)

Suggested Citation: Dipoo, Riyaad R.; Dikgang, Johane (2026) : The Fading Growth Dividend of FDI: Evidence from OECD Economies, 2001-2023, GLO Discussion Paper, No. 1819, Global Labor Organization (GLO), Essen

This Version is available at:

<https://hdl.handle.net/10419/344026>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

The Fading Growth Dividend of FDI: Evidence from OECD Economies, 2001–2023

Riyaad R. Dipoo¹ Johane Dikgang^{*1,2}

¹ Department of Economics and Finance, Florida Gulf Coast University, Fort Myers, Florida, USA.

² The Water School, Florida Gulf Coast University, Fort Myers, Florida, USA.

^{*} Corresponding author: Johane Dikgang, Global Labor Organization (GLO) Fellow. Email: jdikgang@fgcu.edu.

Riyaad R. Dipoo: rrdipoo8816@eagle.fgcu.edu.

Abstract

This study investigates whether the relationship between foreign direct investment (FDI) and economic growth has diminished over time in OECD economies. We analyze World Bank data for 38 OECD countries from 2000 to 2023 using country- and year-fixed-effects models that relate real GDP growth to lagged FDI inflows and macroeconomic controls. Using the 2008–2009 global financial crisis as an economically motivated benchmark, we compare 2001–2008 with 2009–2023. A one-percentage-point increase in lagged FDI relative to GDP is associated with 0.026 percentage points higher annual growth in the earlier period but only 0.006 percentage points in the later period, a decline of roughly 79%. The estimated weakening remains negative across alternative inference methods, lag structures, macroeconomic control strategies, and financial-centre exclusions, although statistical precision varies across specifications. A candidate-date analysis identifies 2009 as the strongest empirical division among start dates from 2005 through 2015, but does not establish a unique structural break. A significant FDI-by-time interaction further indicates a gradual weakening across the sample. Overall, aggregate FDI has become less strongly associated with subsequent economic growth, consistent with, but not directly identifying, changes in the composition and economic content of recorded international investment.

Keywords: FDI; economic growth; OECD; global financial crisis; international investment; phantom FDI

JEL codes: F21, F43, O47, E22

1 Introduction

Foreign direct investment (FDI) is often considered a key driver of economic growth. Beyond providing capital, it can boost productive capacity, introduce new technology and management skills, promote competition, and integrate domestic firms into global production networks. However, these advantages are not guaranteed to occur. Their impact largely depends on the type of investment and the host economy's ability to convert foreign capital into productive activities (Blomström et al., 1994; Borensztein et al., 1998; Alfaro et al., 2004).

The link between FDI and growth may differ over time. Factors such as financial conditions, domestic institutions, investment composition, aggregate demand, and multinational firm behaviour shape how foreign investment affects the host economy. A positive relationship at one point may diminish if the broader investment environment shifts.

The 2008 global financial crisis serves as a natural historical benchmark for assessing whether this relationship evolved over time. It disrupted international financial markets, tightened credit, increased uncertainty, and influenced cross-border investment decisions. Following the crisis, there were notable changes in financial regulation, risk assessment, banking conditions, and multinational-firm strategies (Kinoshita, 2012; Kellard et al., 2022). These developments make the crisis a meaningful point for comparing the FDI–growth relationship. At the same time, longer-term shifts in international investment may also have contributed to any observed weakening.

This question is particularly important for OECD countries, as they are deeply connected to international financial and production networks and are directly affected by the crisis. Although they usually have advanced financial systems, institutions, infrastructure, and human capital, the impact of additional FDI is less likely to address basic capital shortages in these countries. Instead, its value may lie in shaping investment composition, facilitating technology transfer, strengthening domestic linkages, and promoting productivity.

The existing literature offers mixed findings on the link between FDI and growth. Several studies indicate that foreign investment can boost growth when host nations have adequate human capital, financial development, and outward-looking economic policies (Balasubramanyam et al., 1996; Borensztein et al., 1998; Alfaro et al., 2004; Li and Liu, 2005). However, other studies show that the independent impact of FDI diminishes after controlling for endogeneity, country-specific differences, and different estimation techniques (de Mello, 1999; Carkovic and Levine, 2005). These findings imply that the contribution of FDI is conditional rather than universal or fixed.

This study examines whether the link between aggregate FDI inflows and economic growth has diminished over time in OECD countries. Using annual World Bank data for 38 countries from 2000 to 2023, the main model relates annual real GDP growth to lagged FDI inflows,

inflation, unemployment, trade openness, and gross capital formation. Country fixed effects account for persistent differences across economies, while year fixed effects capture common shocks. The primary estimation sample comprises 871 country-year observations from 2001 to 2023. The analysis uses the 2008 global financial crisis as an economically motivated benchmark for comparing earlier and later periods and employs additional trend specifications to assess whether the observed change is gradual rather than abrupt.

The baseline specification interacts lagged FDI with an indicator for the period beginning in 2009. The coefficient on lagged FDI captures its estimated relationship with growth during 2001–2008, while the interaction term measures how that relationship differs during 2009–2023. Since all countries experienced the global crisis and there is no untreated comparison group, this specification should not be interpreted as a difference-in-differences design or as establishing a causal effect of the crisis itself. Instead, it provides a transparent comparison across periods, complemented by alternative break dates and a continuous FDI-by-time-trend specification.

The negative change in the estimated FDI–growth relationship remains broadly consistent across alternative break definitions, distributed-lag models, and leave-one-country-out estimates. However, the sensitivity analyses highlight certain nuances: winsorising extreme FDI observations and excluding Luxembourg reduce statistical precision. Additionally, the presence of a significant FDI-by-time-trend indicates that the decline may have evolved gradually over time rather than suddenly occurring due to a crisis.

This study makes three key contributions. First, it documents a substantial decline over time in the conditional relationship between aggregate FDI inflows and subsequent economic growth in OECD economies. The main comparison shows that the estimated growth association is considerably weaker during 2009–2023 than during 2001–2008, while an additional FDI-by-time-trend specification indicates a gradual decline across the sample period. Thus, the primary finding is not limited to a transient post-crisis effect.

Second, the analysis shows that the 2008 global financial crisis provides an economically meaningful benchmark for this change without implying that it was its sole cause. The estimated post-2008 difference remains broadly consistent across alternative period definitions, distributed-lag models, correlated random-effects estimates, and leave-one-country-out analyses. However, the continuous trend evidence cautions against interpreting 2009 as a uniquely identified structural break.

Third, this study interprets the weakening of the FDI–growth relationship in light of changes in the economic content of recorded international investment. Damgaard et al. (2024) estimate that a significant portion of global FDI is routed through corporate shells with limited real ties to host economies. If recorded inflows increasingly consist of conduit, financial, tax-related, or restructuring transactions rather than investments that expand productive capacity, aggregate

FDI may become a less reliable indicator of subsequent domestic growth. The reduced statistical precision when extreme observations are adjusted or Luxembourg is excluded is consistent with this interpretation, although the available data do not permit a direct test of the underlying composition mechanism.

The results should be interpreted as conditional associations within countries rather than direct causal relationships. While including lagged FDI and fixed effects for country and year helps address some endogeneity issues, they do not fully eliminate concerns regarding anticipation, reverse causality, or omitted time-varying factors. Consequently, the findings indicate a much weaker link between FDI and growth in the later period, but do not establish that the financial crisis itself caused this change in the relationship.

The remainder of this paper is organised as follows: Section 2 reviews the relevant literature; Section 3 introduces the conceptual framework; Section 4 details the data; Section 5 outlines the empirical methodology; Section 6 presents the results and robustness checks; Section 7 discusses the findings, policy implications, and limitations; and Section 8 concludes.

2 Literature Review

2.1 Theoretical Channels Linking FDI and Growth

Foreign direct investment can affect economic growth through capital accumulation, technology transfer, knowledge spillovers, and productive linkages between multinational and domestic firms. These channels can increase productive capacity directly while also generating indirect productivity gains when domestic firms are able to absorb foreign technologies and knowledge (Borensztein et al., 1998; de Mello, 1999; Alfaro et al., 2010).

Technology transfer represents an important potential channel through which FDI can contribute to growth. However, the ability of host economies to benefit from advanced technologies depends on their absorptive capacity. Using data for 69 developing countries, Borensztein et al. (1998) find that the growth benefits associated with FDI depend importantly on the host country's stock of human capital, with higher productivity effects emerging only above a minimum human-capital threshold.

Domestic financial development can influence the effect of foreign investment on economic growth. Well-functioning financial institutions can offer credit to local suppliers, channel capital into productive areas, and support businesses in adopting new technologies introduced by foreign companies. Research by Alfaro et al. (2004) and Alfaro et al. (2010) indicates that countries with more advanced financial markets tend to reap greater benefits from foreign direct investment.

Trade openness and integration into international markets are important complementary factors. According to Balasubramanyam et al. (1996), foreign direct investment (FDI) has a stronger link to economic growth in outward-oriented economies than in those with more restrictive policies. These studies collectively suggest that the impact of FDI relies not only on the volume of capital inflow but also on human capital, financial institutions, trade conditions, and domestic connections.

These theoretical channels imply that the relationship between FDI and growth can differ over time. Factors such as shifts in financial conditions, investment makeup, domestic absorptive capacity, and multinational firm behaviour might influence the impact of foreign investment on economic growth.

2.2 Empirical Evidence on FDI and Growth

However, the empirical evidence is mixed. Borensztein et al. (1998) find that FDI can contribute to growth through technology transfer, but that the benefits depend on sufficient human capital in the host economy. Li and Liu (2005) identify a significant endogenous relationship between FDI and economic growth and show that the relationship also depends on interactions with host-country characteristics. Iamsiraroj (2016), using a broad cross-country sample and a simultaneous-equations approach, likewise reports a positive bidirectional relationship between FDI and economic growth.

Other studies provide more cautious evidence. Carkovic and Levine (2005), using methods designed to address simultaneity and country-specific effects, find that the exogenous component of FDI does not exert a robust independent influence on economic growth. de Mello (1999), using time-series and panel evidence for OECD and non-OECD economies, finds that the extent to which FDI enhances growth depends partly on whether foreign and domestic investment are complementary or substitutive. Together, these findings reinforce the view that the FDI–growth relationship is conditional rather than universal.

The sensitivity of these estimates to model specification is a well-known feature of the literature rather than a minor nuisance. Blonigen and Piger (2014) use Bayesian model averaging on a large set of candidates to show that many covariates previously considered significant in FDI studies do not hold up under systematic model uncertainty. This highlights the importance of thorough robustness testing: in this literature, where results often depend on the chosen specification, a single preferred estimate is less meaningful than consistent results across alternative timing assumptions, lag structures, inference methods, and treatments of influential observations.

This mixed evidence indicates that a single FDI coefficient does not uniformly apply across countries and time periods. While positive estimates might genuinely reflect the effects of

capital and technology, they could also be influenced by the specific traits of countries that attract foreign investment. Consequently, this relationship should be considered conditional rather than universally applicable.

This issue is particularly relevant for OECD economies. Most classical studies focus on developing countries, where foreign investment can ease strict financing constraints and introduce technologies that are not available locally. In contrast, OECD nations typically have larger capital reserves, more sophisticated financial systems, and greater technological capabilities than non-OECD nations. Therefore, the impact of additional FDI in these countries likely hinges more on factors such as investment quality, productivity spillovers, and connections with domestic firms than on capital accumulation alone. Evidence from Eurozone nations also shows a positive long-term link between FDI and economic growth, although the strength of this relationship varies depending on the model (Pegkas, 2015).

2.3 The Global Financial Crisis and International Investment

The global financial crisis changed the landscape of international investments. Financial institutions faced significant losses, credit availability became more limited, uncertainty grew, and cross-border investment decreased. These shifts likely impacted the amount of FDI and the ways in which it influenced domestic economies.

Kinoshita (2012) shows that although FDI is generally regarded as a relatively stable form of international capital flow, it proved less resilient during the 2007–2009 global financial crisis than in earlier crises. The study also emphasises the importance of FDI composition, since different forms of investment can have different implications for host-country growth and external vulnerability. At the firm level, Alfaro and Chen (2012) find that multinational subsidiaries generally performed better during the crisis than comparable domestic establishments and that subsidiaries with stronger production and financial linkages to their parent firms exhibited greater resilience.

Policy uncertainty represents another potential influence on international investment. Choi et al. (2021) find that greater domestic policy uncertainty in host countries reduces FDI inflows and that this effect is stronger in economies with lower levels of financial development. This evidence suggests that uncertainty and domestic financial conditions can jointly influence firms' willingness to undertake long-term foreign investment.

Financial-system conditions provide a related channel. Kellard et al. (2022), studying bilateral FDI in the Eurozone, find that sovereign risk in both origin and host countries affects FDI, while banking risk is particularly relevant when it arises in the investing country. Izadi et al. (2021) likewise examine financial and non-financial determinants of inward FDI before and after the global financial crisis, showing that financial-market conditions are relevant to in-

ternational investment patterns. Focusing specifically on OECD economies, Dellis (2024) finds that greater financial distance between origin and host countries acts as a significant deterrent to bilateral FDI flows.

The crisis may have altered the composition of recorded FDI. Overall FDI figures include greenfield projects, mergers and acquisitions, reinvested earnings, intra-firm loans, corporate restructuring, and flows through special-purpose entities. These elements can impact productive capacity and GDP growth in different ways. An increased focus on acquisitions or financial transactions could reduce the correlation between recorded FDI inflows and domestic output, even if the total inflows appear substantial.

Recent studies have quantified the growth of this wedge. Damgaard et al. (2024) use macro- and micro-level data to distinguish between real and phantom investment in the global FDI network. They estimate that phantom FDI into corporate shells with no substantive connection to the host economy accounts for approximately 40 percent of global FDI. The estimated phantom share increased from slightly above 30 percent in 2009 to almost 40 percent in 2017, while much of this activity is concentrated in offshore financial centres, including Luxembourg and the Netherlands. These findings provide a plausible mechanism through which aggregate FDI statistics may become less closely associated with domestic productive activity and economic growth.

These studies suggest several reasons why the link between FDI and growth may have weakened after 2008. Factors such as tighter credit, increased uncertainty, financial risks, and shifts in investment types could all diminish the productivity benefits of foreign capital. However, they do not prove that all post-2008 changes were solely a result of the crisis. Long-term trends in corporate finance, global production, and international ownership structures may also have played a role.

Overall, the literature shows that FDI's impact on growth depends on financial factors, domestic capacity, and investment type. However, there is limited evidence on how this relationship shifted during the 2008 financial crisis in advanced economies. This study fills this gap by analysing whether the link between one-year-lagged FDI and next year's GDP growth varies between 2001 and 2008 and 2009 and 2023 across OECD countries.

3 Conceptual Model

Foreign direct investment can bolster economic growth by facilitating capital accumulation, transferring technology, enhancing managerial expertise, increasing competition, and connecting global markets. However, these benefits depend on the ability of domestic firms and workers to assimilate new technologies and establish productive partnerships with multinational companies (Blomström et al., 1994; Borensztein et al., 1998; Alfaro et al., 2004).

The strength of these channels may vary over time. Post-2008 conditions, including tighter credit, greater uncertainty, changes in demand, and shifts in the composition of international investment, provide several potential reasons why the relationship between measured FDI inflows and domestic output growth could differ from that observed previously (Choi et al., 2021; Kellard et al., 2022; Kinoshita, 2012). Aggregate FDI may also capture acquisitions, corporate restructuring, intra-firm financing, and pass-through financial flows that have different relationships with domestic productive activity than new capacity-creating investment.

The main hypothesis suggests that lagged FDI correlates positively with GDP growth from 2001 to 2008, but this relationship weakens from 2009 to 2023. Specifically, the model anticipates a positive FDI coefficient for the earlier period ($\beta_1 > 0$) and a negative interaction coefficient after 2008 ($\beta_2 < 0$). The combined marginal effect after 2008 is given by $\beta_1 + \beta_2$.

This prediction relates to a difference in conditional associations rather than the direct causal effect of the financial crisis. The post-2008 interaction might indicate changes caused by the crisis, as well as wider gradual trends in financial conditions, multinational firm behaviour, and FDI composition. Figure 1 provides an overview of the framework, including observable macroeconomic controls, such as inflation, unemployment, trade openness, and gross capital formation.

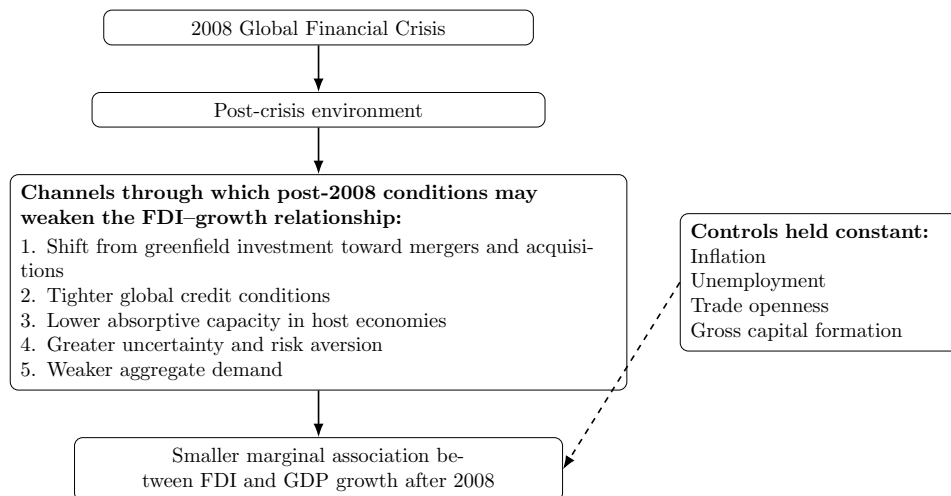


Figure 1: Conceptual Framework for the Changing FDI–Growth Relationship

4 Data

4.1 Data Sources

The analysis utilises annual data from the World Bank’s World Development Indicators for 38 OECD countries, covering 2000–2023 (World Bank, 2026). The variables include real GDP

growth (NY.GDP.MKTP.KD.ZG), FDI net inflows as a share of GDP (BX.KLT.DINV.WD.GD.ZS), consumer price inflation (FP.CPI.TOTL.ZG), unemployment based on national estimates (SL.UEM.TOTL.NE.ZS), trade as a percentage of GDP (NE.TRD.GNFS.ZS), and gross capital formation as a percentage of GDP (NE.GDI.TOTL.ZS).

The full country-year dataset includes 912 observations from 38 countries across 24 years. Because the baseline model employs a one-year lag of FDI, the analysis starts in 2001. Requiring complete data for the dependent variable, lagged FDI, and all controls results in a common sample of 871 observations covering all 38 countries from 2001 to 2023. Thirty-eight observations from 2000 are unavailable because the initial FDI lag cannot be constructed. Three additional observations are excluded: Colombia in 2006 because unemployment data are unavailable, and Luxembourg in 2001 and 2002 because missing FDI data in 2000 and 2001 prevent construction of the corresponding lagged values. No missing values are imputed. Detailed sample information is provided in Appendix B.

Country membership is determined by the OECD roster as of July 2026 and is applied retroactively across the entire period, ensuring that the panel composition remains constant rather than changing with accession dates.

4.2 Variable Definitions

The dependent variable is the annual real GDP growth rate expressed in percentage points. The main explanatory variable is FDI net inflows as a percentage of GDP. Negative FDI values indicate that disinvestment, reverse investment, or withdrawals were higher than new inward investments in that year.

The baseline model incorporates one-year-lagged FDI, denoted as $FDI_{i,t-1}$, meaning that the coefficient relates investment received in the previous year to current GDP growth. The variable $Post2008_t$ equals one from 2009 to 2023 and zero from 2001 to 2008. Interacting this indicator with lagged FDI allows the estimated FDI–growth relationship to differ between the two periods.

The control variables are inflation, unemployment, trade openness, and gross capital formation. Inflation is measured by the annual percentage change in the consumer price index, and unemployment represents the proportion of the labour force that is unemployed. Trade openness is calculated as the sum of exports and imports as a percentage of GDP, and gross capital formation indicates domestic investment as a percentage of GDP. All variables are presented in their original units by the World Bank.

4.3 Descriptive Statistics

Table 1 presents the descriptive statistics for the baseline sample of 871 observations. The average annual GDP growth is 2.384 percent, while current and lagged FDI each constitute approximately 4.23 and 4.572 percent of GDP, respectively.

Table 1: Summary Statistics for the Baseline Analysis Sample

Variable	Obs.	Mean	Std. Dev.	Minimum	Maximum
GDP growth	871	2.384	3.475	−16.040	24.624
FDI	871	4.230	19.337	−391.555	234.311
Lagged FDI	871	4.572	19.287	−391.555	234.311
Inflation	871	3.236	4.783	−4.448	72.309
Unemployment	871	7.407	3.945	1.874	27.686
Trade openness	871	95.257	56.861	19.277	412.177
Gross capital formation	871	23.546	4.488	11.888	53.702

Notes: Statistics use the common 871-observation baseline sample. GDP growth and inflation are annual percentages. FDI, trade openness, and gross capital formation are percentages of GDP. Unemployment is a percentage of the labour force. Lagged FDI is the previous year's FDI net inflow. No missing values are imputed.

FDI exhibits much higher variability than the other variables, with values roughly between −391.555 and 234.311 percent of GDP. Such extreme figures may indicate significant cross-border transactions, corporate restructuring, reverse investments, or activity in financial centres. This broad range motivates the subsequent checks involving winsorisation, the exclusion of Luxembourg, and country-influence analysis. Additionally, the control variables, particularly inflation and trade openness, demonstrate substantial variation.

Figure 2 illustrates the average annual GDP growth and FDI net inflows, highlighting the key periods of contraction during the global financial crisis and COVID-19 pandemic in Panel A.

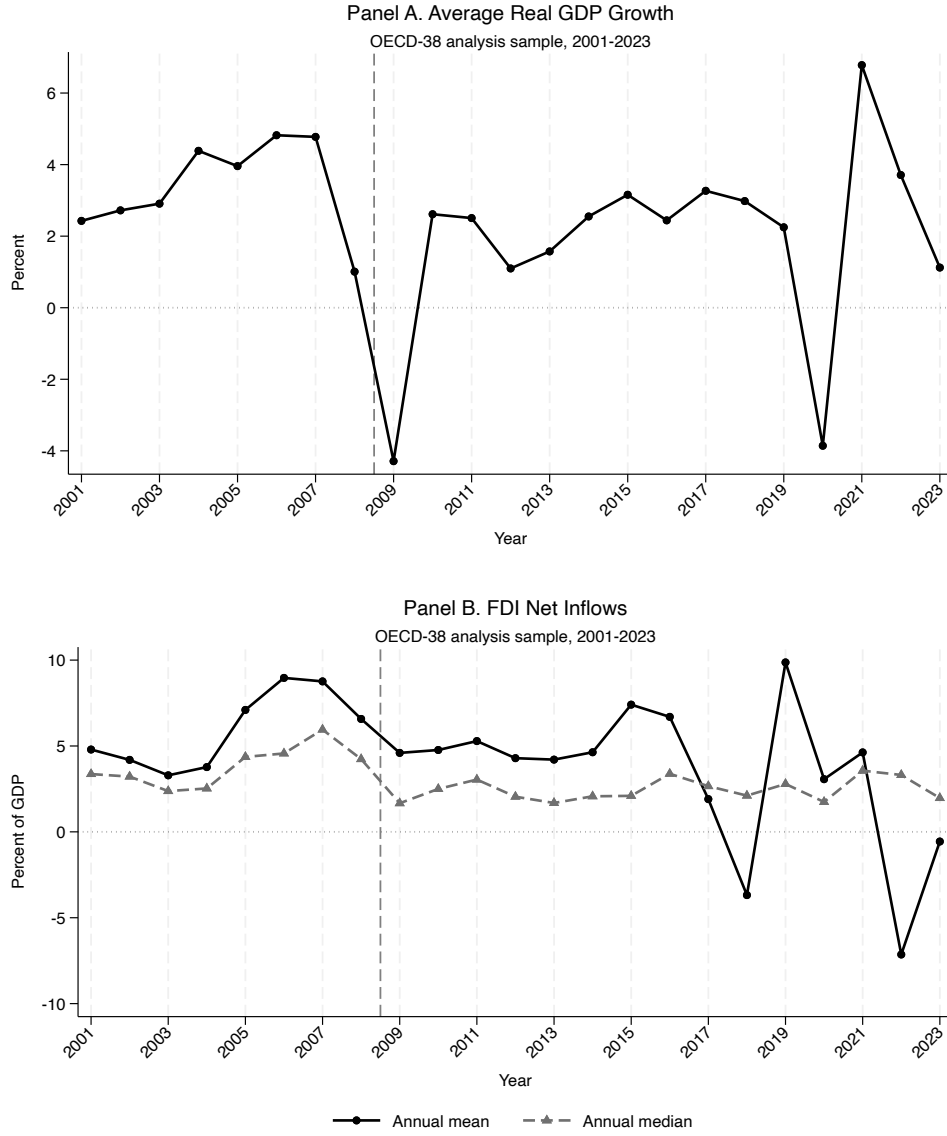


Figure 2: Average GDP Growth and FDI Net Inflows in OECD Countries, 2001–2023

This underscores the need to consider common yearly shocks. Panel B reveals that average FDI is substantially more volatile than median FDI, suggesting that a few extreme data points heavily impact the overall inflow measures. The figure serves a descriptive purpose and does not, on its own, confirm a crisis-driven change in the relationship between FDI and growth.

4.4 Correlation Structure

Table 2 presents the pairwise correlations within the common baseline sample. GDP growth shows a weak correlation with current FDI at 0.095 and lagged FDI at 0.033. Because these unconditional correlations do not adjust for country-specific traits, common shocks, or other macroeconomic controls, they are not expected to align with the fixed-effects estimates pre-

sented later.

Table 2: Pairwise Correlations for the Baseline Analysis Sample

Variable	Growth	FDI	Lagged FDI	Inflation	Unemployment	Trade	GCF
Growth	1.000						
FDI	0.095*	1.000					
Lagged FDI	0.033	0.035	1.000				
Inflation	0.111*	−0.034	−0.005	1.000			
Unemployment	−0.078*	0.011	−0.005	−0.014	1.000		
Trade openness	0.095*	0.053	0.080*	−0.016	−0.078*	1.000	
Gross capital formation	0.347*	0.042	0.048	0.211*	−0.286*	0.036	1.000

Notes: Correlations use the common 871-observation baseline sample. Only the lower triangle is reported.

Asterisks indicate two-sided significance at the 5% level.

The strongest link with GDP growth is its positive correlation with gross capital formation (0.347). Overall, the correlations among the explanatory variables are relatively modest; the highest absolute correlation is -0.287 between unemployment and gross capital formation. Thus, the matrix does not indicate substantial pairwise collinearity, although it serves mainly as a descriptive diagnostic tool rather than a replacement for regression analysis.

5 Empirical Methodology

5.1 Baseline Specification

The analysis assesses whether the conditional link between foreign direct investment and economic growth changed before and after the 2008 global financial crisis. The baseline dataset includes 871 country-year observations across 38 OECD countries from 2001–2023.

The two-way fixed-effects model is defined as

$$\text{Growth}_{it} = \beta_1 \text{FDI}_{i,t-1} + \beta_2 (\text{FDI}_{i,t-1} \times \text{Post2008}_t) + \gamma' \mathbf{X}_{it} + \alpha_i + \lambda_t + \varepsilon_{it}. \quad (1)$$

where Growth_{it} represents annual real GDP growth in country i in year t . The variable $\text{FDI}_{i,t-1}$ denotes one-year-lagged FDI net inflows as a percentage of GDP. Post2008_t equals one for 2009–2023 and zero for 2001–2008. The vector $\mathbf{X}_{it}$ includes inflation, unemployment, trade openness, and gross capital formation.

Country fixed effects, α_i , account for time-invariant differences across countries, while year fixed effects, λ_t , capture shocks common to all countries in a given year. Because Post2008_t

is perfectly collinear with the year fixed effects, its coefficient is not separately identified; attention therefore focuses on the interaction between lagged FDI and the post-2008 indicator.

Coefficient β_1 indicates the estimated relationship between lagged FDI and GDP growth from 2001 to 2008. The interaction coefficient, β_2 , captures how this relationship changes during 2009–2023. Therefore, the marginal association after 2008 is

$$\frac{\partial \text{Growth}_{it}}{\partial \text{FDI}_{i,t-1}} = \beta_1 + \beta_2. \quad (2)$$

Because GDP growth and FDI are expressed in percentage points, the coefficients indicate how much annual GDP growth changes with a one-percentage-point rise in lagged FDI as a share of GDP. The standard errors are clustered by country to account for heteroscedasticity and serial correlation within each country.

The baseline model interacts lagged FDI with an indicator for the period beginning in 2009. The coefficient on lagged FDI reflects its estimated association with growth during 2001–2008, while the interaction term indicates how this relationship differs during 2009–2023. The 2008–2009 global financial crisis provides an economically meaningful benchmark for dividing the sample, but this specification should not be interpreted as a difference-in-differences design or as establishing a causal effect of the crisis itself. Since all countries in the sample experienced the global downturn and there is no untreated comparison group, the interaction is best understood as a comparison of periods in the FDI–growth relationship rather than as a treatment effect of the crisis.

5.2 Identification and Interpretation

Identification is derived from within-country variation in lagged FDI over time. Country fixed effects control for differences that do not change over time between economies, while year fixed effects account for shared annual shocks, such as the global financial crisis, European sovereign debt crisis, and COVID-19 pandemic. Consequently, the interaction coefficient is identified by examining whether the relationship between FDI and growth within each country varies between these two periods.

The specification should be viewed as a period-comparison framework rather than as a traditional difference-in-differences design or a formal structural-break model. Since all countries may have been affected by the financial crisis and there is no untreated comparison group, the interaction term tests whether the FDI–growth association differs between the earlier and later periods. It does not establish that the financial crisis caused the observed change in that association.

Using lagged FDI helps reduce immediate reverse causality because current growth cannot

directly influence FDI from the previous year. However, lagging does not fully prevent anticipation or account for unobserved and time-varying factors. Investment decisions might be based on expected future growth, and fluctuations in financial conditions, institutions, investment types, or multinational firm behaviour can impact both FDI and economic outcomes.

Controls and fixed effects help minimise various confounding factors but do not prove causality. Since there is no credible instrument that influences growth solely through FDI, an instrumental variable approach is not employed. Thus, the estimates should be viewed as conditional associations within each country.

5.3 Robustness and Diagnostic Tests

Multiple checks evaluate whether the baseline results rely on specific timing assumptions, lag structures, inference methods, or influential observations. The timing of the break is varied by setting the later period to start in 2008 and excluding data from 2008 and 2009. Additional lag structures include a two-year FDI lag and a distributed-lag model that incorporates both the first and second FDI lags along with their interactions, after 2008.

To differentiate a discrete break from a gradual change, lagged FDI is multiplied by a linear time trend, while country and year fixed effects are maintained. A placebo test introduces an artificial break starting in 2006 to check for similar changes before the financial crisis.

Inference and model-selection procedures involve Driscoll–Kraay standard errors with two lags, along with the Wooldridge test for first-order serial correlation and the Pesaran test for cross-sectional dependence. A correlated random-effects model, also known as Mundlak, incorporates country-level averages of time-varying regressors to evaluate the suitability of the standard random-effects orthogonality assumption.

The broad spread of FDI prompted three influence checks. Lagged FDI is winsorised at the 1st and 99th percentiles, the baseline model is re-estimated excluding Luxembourg, and a leave-one-country-out method runs 38 estimations, each omitting one country. These steps assess three aspects of stability: whether the interaction remains negative, whether its size is consistent, and whether its statistical significance varies with different assumptions.

We evaluate the sensitivity of this period comparison using several approaches. First, we vary the timing of the later period, considering both a specification in which it begins in 2008 and one that excludes the crisis years 2008 and 2009. We also estimate a continuous FDI-by-time-trend specification and explore alternative lag structures. Second, because aggregate FDI can be exceptionally large in economies that play major roles in international financial and corporate investment networks, we sequentially exclude Luxembourg, the Netherlands, Ireland, and Switzerland. These exclusions serve as sensitivity checks rather than as direct tests of specific FDI composition mechanisms. Finally, we consider six alternative ways of treating

the macroeconomic controls, including specifications that omit contemporaneous gross capital formation, use lagged macroeconomic variables, and incorporate lagged real GDP per capita to account for conditional convergence.

Finally, we assess whether 2009 is unusually informative compared with other plausible period divisions. We re-estimate the baseline country- and year-fixed-effects specification using each year from 2005 through 2015 as the start of the later period and compute the country-clustered Wald statistic for the corresponding change in the FDI coefficient. Because this approach examines multiple potential dates, the pointwise p -values are supplemented with a conservative Bonferroni adjustment. This exercise is therefore used as a diagnostic of the empirical relevance of the 2008–2009 crisis window rather than as a formal test establishing a definitive structural-break date.

6 Results

6.1 Main Results

Table 3 displays the main results. Column (1) shows the baseline two-way fixed-effects model with country-clustered standard errors. Column (2) uses the Driscoll–Kraay standard errors. Column (3) reports the correlated random-effects or Mundlak specification. Column (4) excludes Luxembourg.

Table 3: FDI and Economic Growth Before and After 2008

	(1)	(2)	(3)	(4)
	Baseline FE	Driscoll–Kraay	CRE/Mundlak	Excluding Luxembourg
Lagged FDI: 2001–2008 effect	0.026*** (0.007)	0.026*** (0.007)	0.026*** (0.007)	0.023** (0.010)
Lagged FDI $\times$ post-2008	-0.021*** (0.007)	-0.021** (0.008)	-0.021*** (0.007)	-0.024* (0.014)
Inflation	-0.132*** (0.048)	-0.132*** (0.021)	-0.132*** (0.048)	-0.136*** (0.049)
Unemployment	-0.056* (0.032)	-0.056 (0.052)	-0.056* (0.032)	-0.049 (0.035)
Trade openness	0.026*** (0.009)	0.026* (0.013)	0.026*** (0.009)	0.036*** (0.008)
Gross capital formation	0.291*** (0.061)	0.291*** (0.075)	0.291*** (0.061)	0.296*** (0.067)
Post-2008 marginal effect	0.006	0.006	0.006	-0.001
SE: post-2008 effect	0.002	0.002	0.002	0.010
Pre/post interaction p-value	0.006	0.012	0.004	0.088
Observations	871	871	871	850
Countries	38	38	38	37
Within R-squared	0.623	0.623	0.623	0.627
Country effects	Yes	Yes	CRE	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Mundlak country means	No	No	Yes	No

Standard errors in parentheses

Dependent variable: annual real GDP growth, measured in percentage points.

Columns 1 and 4 use standard errors clustered by country.

Column 2 uses Driscoll–Kraay standard errors with two lags.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In the baseline model, the coefficient for one-year-lagged FDI is 0.026, which is statistically significant at the 1% level. This means that a 1-percentage-point rise in lagged FDI as a share of GDP correlates with approximately 0.026 percentage points of extra annual GDP growth during 2001–2008, assuming controls and fixed effects remain unchanged.

The post-2008 interaction is approximately -0.021 and statistically significant, with a p-value of 0.006. Incorporating this interaction with the earlier period's coefficient yields a post-2008 marginal effect of roughly 0.006, which is also statistically significant (p-value 0.014). Consequently, the estimated FDI–growth relationship during 2009–2023 is approximately 79 percent weaker than that in 2001–2008.

The Driscoll–Kraay and CRE/Mundlak specifications yield similar point estimates. Their interaction p-values are 0.012 and 0.004, respectively, and the post-2008 marginal effects remain positive and statistically significant. This consistency suggests that the main finding is robust across different inference methods and panel model approaches.

Excluding Luxembourg results in a negative interaction of approximately -0.024 , which is slightly larger in magnitude, but the p-value increases to 0.088. The estimated effect after 2008 is approximately -0.001 and is not statistically significant. Although excluding Luxembourg reduces the statistical precision of these estimates, its removal does not eliminate the observed decline.

Inflation is negatively associated with growth, whereas trade openness and gross capital formation are positively associated with growth. The baseline within- R^2 is approximately 0.623. Overall, the results indicate a significantly weaker conditional FDI–growth relationship after 2008, although they do not prove that the financial crisis directly caused this shift in the relationship.

The within- R^2 indicates the variation explained after the within transformation, accounting for the year fixed effects that absorb the significant common contractions in 2009 and 2020. Therefore, it should not be interpreted as the explanatory power of FDI or macroeconomic controls.

6.2 Robustness and Sensitivity Analysis

Table 4 outlines the main robustness and sensitivity checks performed. The estimated change mostly remains negative, although its statistical significance differs across various specifications. The use of different break definitions aligns with the original pattern. For example, if the later period starts in 2008, the change estimate is -0.037 with a p-value of 0.015, while the later-period association remains positive at 0.006. If 2008 and 2009 are excluded, the change estimate is -0.029 , with a p-value of 0.055. These findings suggest that the main result is not driven solely by observations from the immediate crisis years.

Table 4: Summary of Robustness and Sensitivity Results

Specification	Initial/reference effect	Change	Later-period effect	Obs.
Baseline FE	0.026 (0.001)	−0.021 (0.006)	0.006 (0.014)	871
Break begins in 2008	0.043 (0.006)	−0.037 (0.015)	0.006 (0.005)	871
Exclude 2008 and 2009	0.034 (0.034)	−0.029 (0.055)	0.005 (0.018)	795
Two-year FDI lag	0.015 (0.316)	−0.024 (0.104)	−0.009 (0.019)	833
Distributed lag	0.038 (0.016)	−0.040 (0.012)	−0.002 (0.619)	833
Linear FDI time trend	0.023 (0.001)	−0.001 (0.001)	0.003 (0.178)	871
Placebo break in 2006	0.025 (0.235)	−0.018 (0.397)	0.007 (0.002)	871
Winsorized lagged FDI	0.031 (0.013)	−0.021 (0.235)	0.010 (0.439)	871
Exclude Luxembourg	0.023 (0.030)	−0.024 (0.088)	−0.001 (0.888)	850
Exclude LUX + NLD	0.019 (0.272)	−0.020 (0.330)	−0.002 (0.894)	827
Exclude LUX + NLD + IRL	0.028 (0.077)	−0.036 (0.021)	−0.008 (0.416)	804
Exclude broader financial centres	0.026 (0.082)	−0.035 (0.024)	−0.009 (0.372)	781

Notes: Parentheses contain p-values. The initial/reference effect is the 2001–2008 lagged-FDI coefficient except where a specification has a different timing definition. The change column reports the estimated change in the FDI association across periods (or the comparable change for the stated specification). The later-period effect is the corresponding marginal FDI association after the change.

The lag specifications provide mixed evidence. With only a two-year FDI lag, the reference coefficient and interaction terms are not statistically significant. However, the post-2008 association is negative, approximately -0.009 , and statistically significant ($p = 0.019$). In the distributed-lag model, the cumulative pre-2009 association is 0.038 , while the change after 2008 is -0.040 ($p = 0.012$). The cumulative association in the later period is near zero and not statistically significant.

The linear-trend specification complements the break analysis. The estimated annual change in the FDI association is approximately -0.00135 percentage points, with a p-value below 0.001 . The implied association declines from approximately 0.023 in 2008 to approximately 0.003 in 2023. The break specification tests whether the average FDI–growth association differs between the earlier and later periods, whereas the trend specification examines whether the relationship changes gradually over time. Taken together, the results indicate a substantially weaker association in the later period and suggest that a gradual decline is plausible. They do not, however, establish the financial crisis as the unique causal turning point. The placebo interaction beginning in 2006 is not statistically significant ($p = 0.397$), providing no evidence of a comparable pre-crisis break.

The handling of extreme observations affects the precision of the estimates. When win-sorising lagged FDI, the interaction stays around -0.021 , but its p-value increases to 0.235 . Removing Luxembourg similarly maintains the negative interaction, though its statistical significance diminishes. Nonetheless, all 38 leave-one-country-out estimates continue to be negative; 36 are statistically significant at the five percent level, and all are significant at the ten percent level. Thus, no single country alters the overall estimated trends.

The Wooldridge test indicates first-order serial correlation ($p < 0.001$), supporting the use

of inference that is robust to within-country serial correlation. The Pesaran test provides no evidence of cross-sectional dependence ($p = 0.755$). As an additional inference check, the baseline model is also estimated using Driscoll–Kraay standard errors, which produce similar conclusions regarding the post-2008 interaction.

Overall, the robustness analysis indicates a weaker link between FDI and growth in the later periods. This pattern remains consistent across different timing definitions, inference methods, and countries. However, the winsorised-FDI, Luxembourg-exclusion, and linear-trend results should be interpreted carefully, particularly with respect to statistical precision and the interpretation of 2008 as a uniquely sharp turning point.

6.3 Sensitivity to Financial Centres, Controls, and Break Timing

The estimated weakening is not driven solely by Luxembourg or by a single financial-centre economy. Excluding Luxembourg reduces the precision of the interaction estimate, yielding a change of -0.024 with a p -value of 0.088 . Excluding both Luxembourg and the Netherlands produces a change of -0.020 , although the estimate is less precise ($p = 0.330$). When Ireland is also excluded, the estimated decline becomes larger, at -0.036 ($p = 0.021$), and remains statistically significant. Excluding Luxembourg, the Netherlands, Ireland, and Switzerland produces a similar estimate of -0.035 ($p = 0.024$). Overall, although statistical precision varies across the different exclusion rules, the weakening of the FDI–growth association cannot be attributed solely to one or two financial-centre economies.

These findings should not be interpreted as identifying a particular “phantom FDI” or financial-centre mechanism. The World Bank measure used here records annual net FDI inflows as a percentage of GDP and does not distinguish the underlying economic content of individual investment flows. The financial-centre exclusions therefore indicate that the core result is not simply driven by a small number of economies with exceptionally large FDI flows, while the precise compositional mechanism remains an area for future research.

The full set of alternative control specifications is reported in Table 7 in Appendix E. The estimated decline remains fairly consistent across alternative treatments of the macroeconomic controls, although its statistical precision depends on the conditioning set. Across six specifications, the estimated change in the FDI–growth association remains negative, ranging from approximately -0.013 to -0.021 .

With country and year fixed effects but no additional macroeconomic controls, the estimated change is -0.013 . Removing contemporaneous gross capital formation from the controls produces an estimate of -0.017 ($p = 0.128$). Using lagged macroeconomic controls gives an estimate of -0.017 ($p = 0.058$), while adding lagged log real GDP per capita produces a similar estimate of -0.018 ($p = 0.052$).

The direction and economic magnitude of the estimated weakening are therefore more stable than its conventional statistical significance. This distinction is important because contemporaneous gross capital formation may partly capture a channel through which FDI is associated with growth, while inflation, unemployment, trade, and investment conditions may also respond contemporaneously to changes in economic activity. We therefore retain the baseline specification as the principal conditional-association model and report the alternative control specifications as sensitivity checks.

The full candidate-date profile and corresponding graphical diagnostics are reported in Table 8 and Figures 6–7 in Appendix E.

The candidate-date exercise provides additional context for selecting 2009 as the beginning of the later period. Among candidate start dates from 2005 through 2015, 2009 yields the largest country-clustered Wald statistic, $W = 8.37$.

The corresponding change in the FDI coefficient is -0.021 , with a pointwise p -value of 0.006. Beginning the later period in 2008 produces a larger coefficient change of -0.037 , but a smaller Wald statistic of 6.46 and a pointwise p -value of 0.015. Candidate dates before 2008 provide substantially weaker evidence of a change.

Because the strongest candidate is selected after evaluating 11 potential start dates, the pointwise p -value does not account for multiple testing. Applying a conservative Bonferroni adjustment raises the p -value for the 2009 candidate to 0.070. We therefore interpret the exercise as showing that 2009 provides the strongest empirical separation among the candidate dates considered, rather than as establishing 2009 as a uniquely identified structural break.

7 Discussion

7.1 Interpretation of the Findings

The key finding is that the conditional association between aggregate FDI inflows and subsequent economic growth diminished substantially over the study period. The baseline period comparison illustrates the magnitude of this change: a one-percentage-point increase in lagged FDI relative to GDP is associated with approximately 0.026 percentage points higher annual growth during 2001–2008, but only about 0.006 percentage points during 2009–2023, representing a decline of roughly 79 percent. The continuous time-trend analysis points in the same direction, suggesting that the weakening is part of a broader temporal decline rather than the result of a single crisis-induced shift.

The length of the later period is noteworthy. It spans 15 years, including the post-crisis recovery, the European sovereign debt crisis, a prolonged expansion, and the COVID-19 con-

traction and rebound. The average estimated FDI–growth association during 2009–2023 remains substantially below that estimated for 2001–2008. Together with the negative FDI-by-time-trend estimate, this suggests that the weaker relationship is not confined to the immediate aftermath of the financial crisis.

The negative interaction remains broadly consistent across alternative break definitions, distributed-lag estimates, and leave-one-country-out analyses. No single country changes the sign of the interaction estimate. However, the sensitivity analyses temper the strength of the conclusions. Winsorising extreme FDI values keeps the estimated interaction close in size but lowers its statistical precision. Excluding Luxembourg produces a similar pattern. The result is therefore stable in direction, although its statistical precision is partly sensitive to extreme cross-border flows.

The linear-trend specification offers the key qualification, showing that the estimated FDI–growth relationship gradually declines throughout the sample period. This suggests that the post-2008 interaction reflects not only crisis-related changes but also a longer-term weakening of the overall economic link between FDI inflows and growth.

The evidence indicates a significant difference between the periods of 2001–2008 and 2009–2023, although it does not prove that the global financial crisis was the sole cause of this change. While country and year fixed effects capture lasting national traits and shared yearly shocks, they do not differentiate the crisis from other structural developments that occurred later.

Overall, these findings are consistent with a broader weakening of the association between aggregate FDI and growth rather than with a specific causal effect of the global financial crisis. The 2008–2009 period remains economically important: 2009 provides the clearest separation among the candidate dates examined, while specifications beginning the later period in 2008 also show a substantial decline. Moreover, the FDI-by-time-trend interaction indicates that the weakening extends across the sample rather than being confined to a single crisis date. The crisis period is therefore best viewed as an economically meaningful benchmark within a broader long-running change in the FDI–growth relationship.

One possible explanation is that the composition of measured FDI has evolved over time. Aggregate FDI encompasses investment flows that may differ substantially in their implications for domestic productive capacity, technology transfer, employment, and capital formation. The sensitivity analysis excluding major financial-centre economies suggests that the decline is broader than the influence of any single centre. However, the available aggregate data do not permit direct identification of this compositional mechanism. This interpretation should therefore be viewed as a hypothesis consistent with the observed empirical pattern rather than as a mechanism established by the present analysis.

7.2 Potential Mechanisms

Several factors may account for the weaker association in the later period. One is a shift in the composition of FDI. Total inflows include greenfield projects, mergers and acquisitions, reinvested earnings, intra-firm lending, corporate restructuring, and flows via special-purpose entities. These components may affect employment, productive capacity, technology transfer, and GDP growth in different ways. An increased emphasis on acquisitions or financial transactions may weaken the link between recorded FDI and domestic output.

Descriptive evidence supports this idea. The annual mean FDI shows much more fluctuation than the median FDI, with several outlier points in financial centre economies. The decrease in precision after winsorisation and the exclusion of Luxembourg indicates that very large financial flows impact the estimates. While these results do not confirm a change in FDI composition, they suggest that headline inflows may include transactions with minimal direct links to domestic productive activity.

The measurement literature provides evidence consistent with this interpretation. Damgaard et al. (2024) estimate that approximately 40% of global FDI is associated with phantom investment and document substantial concentrations of such activity in major financial centres, including Luxembourg and the Netherlands. The sensitivity of our estimates to Luxembourg is therefore consistent with the possibility that conduit activity affects the relationship between aggregate FDI measures and domestic economic outcomes. However, because the World Development Indicators do not distinguish real from phantom FDI at the country-year level, this sensitivity cannot establish the composition mechanism directly.

Financial conditions offer another potential explanation for this finding. The benefits of FDI partly depend on the ability of domestic financial institutions, suppliers, and workers to translate foreign investment into broader economic gains (Alfaro et al., 2004, 2010). After the financial crisis, tighter credit, greater uncertainty, and elevated risk may have weakened these linkages, even where foreign investment persisted (Choi et al., 2021; Kellard et al., 2022).

The gradual trend also indicates broader long-term structural changes. The sample period also witnessed changes in multinational production, intangible assets, corporate financing, and cross-border ownership structures. As a result, measured FDI may have become less directly linked to new physical investment and short-run domestic output. Because the empirical approach does not allow us to distinguish the relative importance of these mechanisms, they should be viewed as plausible explanations rather than confirmed causal pathways.

7.3 Policy Implications

The findings primarily concern how aggregate foreign investment is interpreted as a policy indicator. If a growing share of recorded inflows reflects holding-company activity, intra-firm financing, transactions involving intangible assets, or other financial arrangements, headline FDI may become a less direct proxy for new productive activity in the host economy. Our results are consistent with this concern: the estimated relationship between recorded inflows and subsequent growth is substantially weaker in 2009–2023 than in 2001–2008. This does not imply that policies aimed at attracting FDI are ineffective. Rather, it suggests that aggregate inflow measures should be complemented by indicators of investment composition, domestic linkages, employment, and productive capacity when evaluating economic benefits.

Policies aimed at attracting foreign investment should be linked to tangible domestic benefits. Initiatives such as workforce training, supplier development programmes, research collaborations, and employment- or productivity-related incentives can help reinforce the connection between foreign capital and the host country's economy. Relying solely on broad tax concessions based on the amount of announced FDI may be less effective if these inflows do not lead to significant new activity.

Maintaining a robust domestic absorptive capacity is essential. Factors such as human capital, financial development, technological capabilities, and institutional quality determine how effectively knowledge and productivity gains benefit beyond foreign-owned companies (Borensztein et al., 1998; Alfaro et al., 2004). Investing in these foundational elements can be as important as enacting policies to increase FDI.

These findings should not be interpreted as a broad critique of foreign investment. FDI can offer advantages beyond annual GDP growth, such as fostering innovation, boosting exports, increasing competition, creating jobs, and integrating into global production networks. From a policy perspective, it is important to evaluate these benefits more thoroughly and differentiate between productive investments and mere flow or balance sheet movements.

These effects extend beyond individual host economies. Because conduit structures channel investments through third jurisdictions before reaching their final destination, the recorded inflows of one country are influenced by the tax and regulatory decisions of others. As a result, bilateral and multilateral statistics based on headline positions may not fully reflect the underlying geography of investment. This creates a case for greater coordination in international reporting standards, particularly where conduit structures span multiple jurisdictions. The weakening we observe is best seen as a characteristic of an interconnected international investment system rather than isolated national changes.

7.4 Limitations

This analysis has several limitations. First, as an observational study, it identifies conditional correlations rather than definitive causal effects. Using lagged FDI helps lessen reverse causality within the same period, and fixed effects for country and year control for various unobserved heterogeneity. Nonetheless, investment could be affected by anticipated future growth, and unmeasured time-varying elements may impact both FDI and economic outcomes.

Second, the post-2008 indicator cannot distinguish the financial crisis from other developments between 2009 and 2023. Factors such as changes in financial regulation, global value chains, multinational firm behaviour, digitalisation, and investment composition might also influence the estimated difference. The notable linear trend interaction further supports the potential for gradual structural change.

Third, aggregate FDI does not differentiate between greenfield investments, mergers and acquisitions, reinvested earnings, intra-firm finance and pass-through transactions. These investment types can have markedly different economic impacts. More detailed sectoral, transaction, or firm-level data would clarify the mechanisms discussed earlier.

This constraint is directly related to our preferred interpretation. As the World Development Indicators report aggregates inflows without distinguishing between real and phantom components, we cannot directly test the composition mechanism. Our evidence remains indirect, relying on the estimates' sensitivity to conduit economies and extreme data points rather than an explicit change in composition. Although country-level estimates of phantom shares, such as those by Damgaard et al. (2024), exist for a limited number of economies and years, aligning them with growth outcomes is a logical next step, which our current data do not support.

Fourth, the estimates are sensitive in precision to extreme observations. Winsorisation and excluding Luxembourg kept the negative interaction but reduced its statistical significance. The leave-one-country-out analysis indicates that no single country changes the overall result, but unusually large financial flows still play a crucial role in the inference.

Finally, annual GDP growth might not fully represent the long-term or overall impact of foreign investment, and the OECD sample restricts the ability to generalise the findings to developing economies. Future research should differentiate between types of investment, analyse productivity and employment effects, and investigate whether factors such as financial development, human capital, or domestic connections account for differences among countries.

8 Conclusion

This study investigates whether the relationship between aggregate foreign direct investment (FDI) inflows and economic growth has diminished over time in OECD countries. We analyze annual data for 38 countries from 2000 to 2023 and employ country- and year-fixed-effects models relating real GDP growth to lagged FDI inflows and macroeconomic controls. The 2008–2009 global financial crisis provides an economically meaningful benchmark for comparing earlier and later portions of the sample, while additional specifications allow the relationship to vary more gradually over time.

The baseline results show that a 1 percentage point increase in lagged FDI as a share of GDP is associated with approximately 0.026 percentage points higher annual GDP growth during 2001–2008. In contrast, the estimated association during 2009–2023 falls to approximately 0.006 percentage points, a decline of roughly 79 percent. The negative interaction between lagged FDI and the later-period indicator is statistically significant in the baseline model and remains similar under Driscoll–Kraay inference and the correlated random-effects specification.

The direction and economic magnitude of the estimated weakening are also fairly stable across alternative timing assumptions, lag structures, macroeconomic control strategies, financial-centre exclusions, and leave-one-country-out exercises, although statistical precision varies across specifications. In particular, sequentially excluding Luxembourg, the Netherlands, Ireland, and Switzerland does not eliminate the negative change, indicating that the baseline result is not driven solely by one or two financial-centre economies. Alternative treatments of the macroeconomic controls likewise produce negative interaction estimates of broadly similar magnitude, even where conventional statistical significance becomes weaker.

The candidate-date analysis provides additional support for using 2009 as the beginning of the later period. Among candidate start dates from 2005 through 2015, 2009 produces the largest country-clustered Wald statistic. However, after accounting conservatively for the search across multiple candidate dates, the corresponding Bonferroni-adjusted p -value is 0.070. We therefore view the 2008–2009 crisis period as an economically and empirically meaningful benchmark rather than as a uniquely identified structural break. The significant FDI-by-time-trend interaction further suggests that the weakening may reflect a broader gradual change rather than a discrete shift caused by the crisis.

The findings therefore indicate a substantially weaker association between aggregate FDI inflows and subsequent economic growth in the later part of the OECD sample, but they do not establish that the global financial crisis caused this change. Using lagged FDI together with country and year fixed effects helps address some sources of endogeneity, but anticipation, unobserved time-varying factors, and changes in the composition of recorded FDI may still

contribute to the observed pattern.

More broadly, aggregate FDI inflows should not necessarily be interpreted as a uniform measure of productive foreign investment. Different forms of FDI may have different implications for domestic productive capacity, technology transfer, supplier relationships, employment, and capital formation, while other flows may be more closely associated with acquisitions, corporate restructuring, or cross-border financial arrangements. One plausible interpretation of the results is therefore that changes in the composition and economic content of recorded FDI contribute to the weakening association documented here. The aggregate data used in this study cannot identify that mechanism directly.

Future research using more detailed information on the type, sector, destination, and ultimate ownership of foreign investment would be especially valuable for determining whether changes in the composition of recorded FDI help explain the weakening relationship between aggregate FDI and economic growth.

Acknowledgements

An earlier version of this paper was developed during an undergraduate research seminar at Florida Gulf Coast University. All remaining errors are our own.

Declarations

Funding. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflict of Interest. The authors declare no conflict of interest.

Data Availability. The data used in this study are publicly available from the World Bank World Development Indicators at <https://databank.worldbank.org/source/world-development-indicators>. The cleaned dataset and Stata code used to reproduce the results are available from the corresponding author upon reasonable request.

Artificial Intelligence Disclosure. During preparation of this manuscript, the authors used generative-AI and AI-assisted research tools, including ChatGPT (OpenAI), Consensus, Elicit, Semantic Scholar, Perplexity, and Thesify, to assist with literature discovery and organization, comparison of published findings, clarification of research concepts, language editing, and preparation and formatting of manuscript materials based on author-generated statistical output. These tools were not treated as scholarly sources and were not used to generate the underlying data or econometric estimates. The empirical analysis was conducted by the authors in Stata

using World Bank World Development Indicators data. All AI-assisted material incorporated into the manuscript was reviewed and revised by the authors, who take full responsibility for the accuracy, interpretation, citations, and final content of the manuscript.

References

- Alfaro, L., Chanda, A., Kalemli-Ozcan, S., and Sayek, S. (2004). FDI and economic growth: The role of local financial markets. *Journal of International Economics*, 64(1):89–112.
- Alfaro, L. and Chen, M. X. (2012). Surviving the global financial crisis: Foreign ownership and establishment performance. *American Economic Journal: Economic Policy*, 4(3):30–55.
- Alfaro, L., Kalemli-Ozcan, S., and Sayek, S. (2010). Does foreign direct investment promote growth? exploring the role of financial markets on linkages. *Journal of Development Economics*, 91(2):242–256.
- Balasubramanyam, V. N., Salisu, M., and Sapsford, D. (1996). Foreign direct investment and growth in EP and IS countries. *The Economic Journal*, 106(434):92–105.
- Blomström, M., Lipsey, R. E., and Zejan, M. (1994). What explains the growth of developing countries? In Baumol, W. J., Nelson, R. R., and Wolff, E. N., editors, *Convergence of Productivity: Cross-National Studies and Historical Evidence*, pages 243–259. Oxford University Press, Oxford.
- Blonigen, B. A. and Piger, J. (2014). Determinants of foreign direct investment. *Canadian Journal of Economics*, 47(3):775–812.
- Borensztein, E., De Gregorio, J., and Lee, J.-W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics*, 45(1):115–135.
- Carkovic, M. and Levine, R. (2005). Does foreign direct investment accelerate economic growth? In Moran, T. H., Graham, E. M., and Blomström, M., editors, *Does Foreign Direct Investment Promote Development?*, pages 195–220. Institute for International Economics and Center for Global Development, Washington, DC.
- Choi, S., Furceri, D., and Yoon, C. (2021). Policy uncertainty and foreign direct investment. *Review of International Economics*, 29(2):195–227.
- Damgaard, J., Elkjaer, T., and Johannesen, N. (2024). What is real and what is not in the global FDI network? *Journal of International Money and Finance*, 140:102971.
- de Mello, Jr., L. R. (1999). Foreign direct investment-led growth: Evidence from time series and panel data. *Oxford Economic Papers*, 51(1):133–151.

- Dellis, K. (2024). Financial distance and FDI flows: Evidence from OECD economies. *The World Economy*, 47(6):2536–2573.
- Iamsiraroj, S. (2016). The foreign direct investment–economic growth nexus. *International Review of Economics & Finance*, 42:116–133.
- Izadi, S., Rashid, M., and Izadi, P. (2021). FDI inflow and financial channels: International evidence before and after crises. *Journal of Financial Economic Policy*, 14(1):24–42.
- Kellard, N. M., Kontonikas, A., Lamla, M. J., Maiani, S., and Wood, G. (2022). Risk, financial stability and FDI. *Journal of International Money and Finance*, 120:102232.
- Kinoshita, Y. (2012). Foreign direct investment and the crisis: Is this time different? *IMF Research Bulletin*, 13(1).
- Li, X. and Liu, X. (2005). Foreign direct investment and economic growth: An increasingly endogenous relationship. *World Development*, 33(3):393–407.
- Pegkas, P. (2015). The impact of FDI on economic growth in Eurozone countries. *The Journal of Economic Asymmetries*, 12(2):124–132.
- World Bank (2026). World development indicators. <https://databank.worldbank.org/source/world-development-indicators>. Data retrieved via the World Bank Indicators API on 15 July 2026.

Appendix A: OECD Country Coverage

Table 5 presents the 38 OECD countries included in the cleaned panel, along with the number of observations that each contributes to the baseline analysis. The intended baseline period comprises 23 annual data points for each country from 2001 to 2023. Colombia has 22 observations due to missing unemployment data in 2006, while Luxembourg has 21 because of absent FDI data that affect the calculation of lagged FDI for 2001 and 2002. All other countries provided 23 observations. The country list is based on the OECD-38 roster as of July 2026, including pre-accession years, to maintain a consistent panel.

Table 5: OECD Countries and Baseline Analysis-Sample Coverage

Country	Obs.	Country	Obs.
Australia	23	Japan	23
Austria	23	Korea, Rep	23
Belgium	23	Latvia	23
Canada	23	Lithuania	23
Chile	23	Luxembourg	21
Colombia	22	Mexico	23
Costa Rica	23	Netherlands	23
Czechia	23	New Zealand	23
Denmark	23	Norway	23
Estonia	23	Poland	23
Finland	23	Portugal	23
France	23	Slovak Republic	23
Germany	23	Slovenia	23
Greece	23	Spain	23
Hungary	23	Sweden	23
Iceland	23	Switzerland	23
Ireland	23	Turkiye	23
Israel	23	United Kingdom	23
Italy	23	United States	23

Notes: The cleaned panel contains 38 OECD countries from 2000–2023. Because the baseline model uses one-year-lagged FDI, the effective analysis period is 2001–2023. The baseline sample contains 871 observations.

Appendix B: Sample Construction and Missing Data

The cleaned panel contains a country-year row for each of the 38 countries in every year from 2000 to 2023, resulting in 912 observations. The country-year structure is therefore strongly balanced, although a small number of individual variables contain missing values.

The original World Development Indicators series shows missing unemployment data for Colombia in 2006 and for Mexico in 2000, along with missing FDI data for Luxembourg in 2000 and 2001. No missing values were imputed.

The one-year-lagged FDI excludes 38 observations from 2000 because of the absence of prior-year FDI data. Colombia in 2006 was also excluded because unemployment data were unavailable. Luxembourg for 2001 and 2002 is excluded because missing FDI data in 2000 and 2001 prevent the creation of lagged observations. Mexico’s missing unemployment data in 2000 do not result in further exclusion, as all 2000 data are already outside the lagged FDI

analysis period.

Table 6: Baseline Sample Accounting

Sample characteristic	Value
Countries in cleaned panel	38
Full panel period	2000–2023
Full country-year observations	912
Potential lagged-FDI estimation period	2001–2023
Observations unavailable because of initial FDI lag	38
Additional observations excluded	3
Total observations excluded	41
Baseline analysis observations	871
Countries retained in baseline analysis	38
Missing-data imputation used	No
Country-year identifiers unique	Yes

Notes: The three additional exclusions are Colombia in 2006 and Luxembourg in 2001 and 2002. The same 871-observation sample is used for the principal descriptive statistics, correlation matrix, and baseline fixed-effects regression.

Appendix C: Additional Graphical Evidence

Figure 3 shows the estimated marginal relationship between lagged FDI and GDP growth for the two periods. The association decreases from about 0.026 in 2001–2008 to roughly 0.006 in 2009–2023. While both estimates are positive in the baseline model, the estimate for the later period is notably smaller.

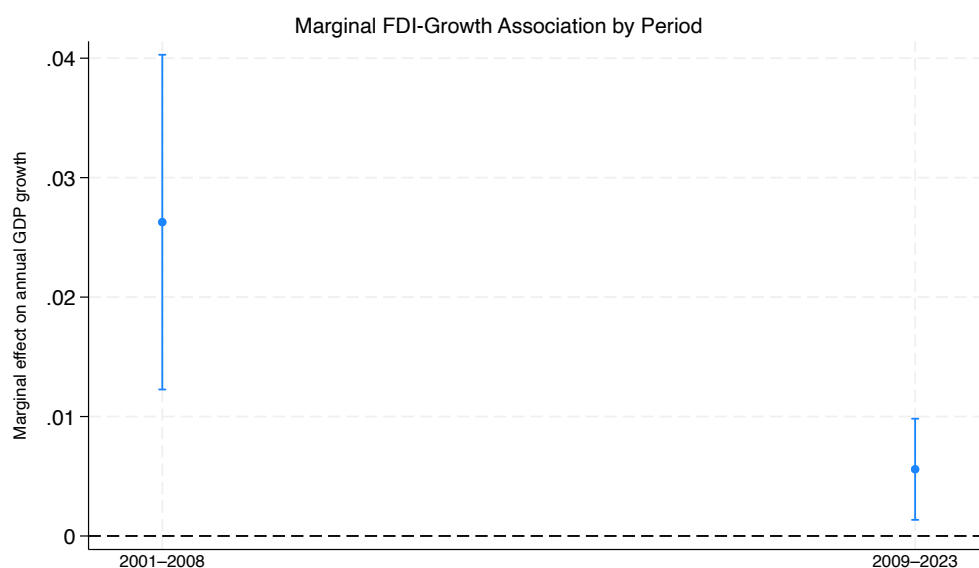


Figure 3: Marginal Association Between Lagged FDI and GDP Growth by Period

Notes: Marginal effects are from the baseline model with country and year fixed effects. Vertical bars indicate 95% confidence intervals based on standard errors clustered by country.

Figure 4 shows year-by-year estimated slopes linking lagged FDI to GDP growth. Many estimates are somewhat imprecise and should be viewed as descriptive rather than traditional causal-event studies. The figure highlights how the relationship between FDI and GDP changes over time and complements the pooled break and linear-trend models. The vertical bars depict 95 percent confidence intervals, with standard errors clustered by country.

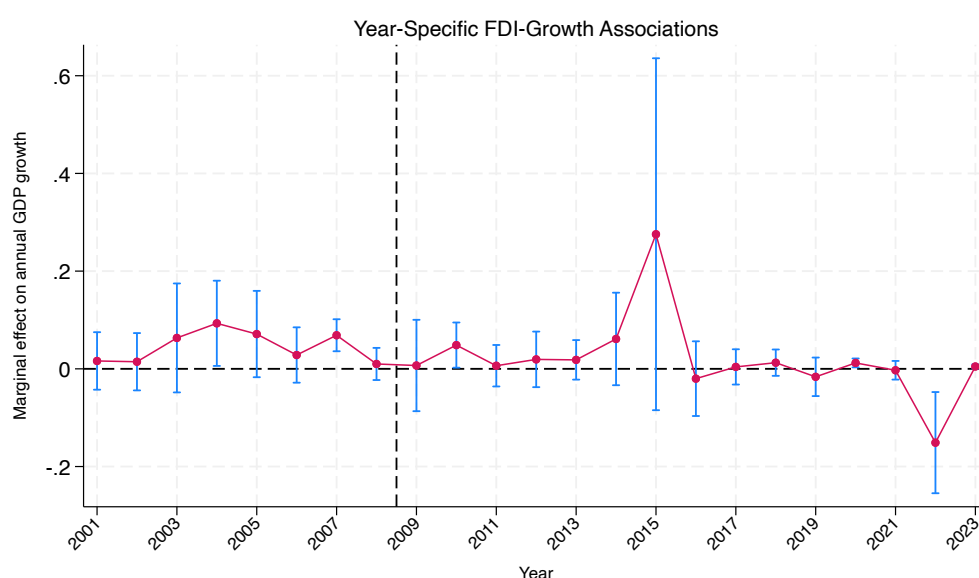


Figure 4: Event-Study-Style Estimates of the Year-Specific FDI Association

Notes: The figure reports year-specific marginal associations between one-year-lagged FDI and annual GDP growth, controlling for country and year fixed effects and the baseline macroeconomic controls. It is descriptive and should not be interpreted as a causal event study.

Figure 5 shows the interaction coefficient after removing each country individually. In all cases, the estimates remained negative, with 36 being statistically significant at the five-percent level and all at the ten-percent level. This suggests that no single country alters the overall direction of the post-2008 change estimates.

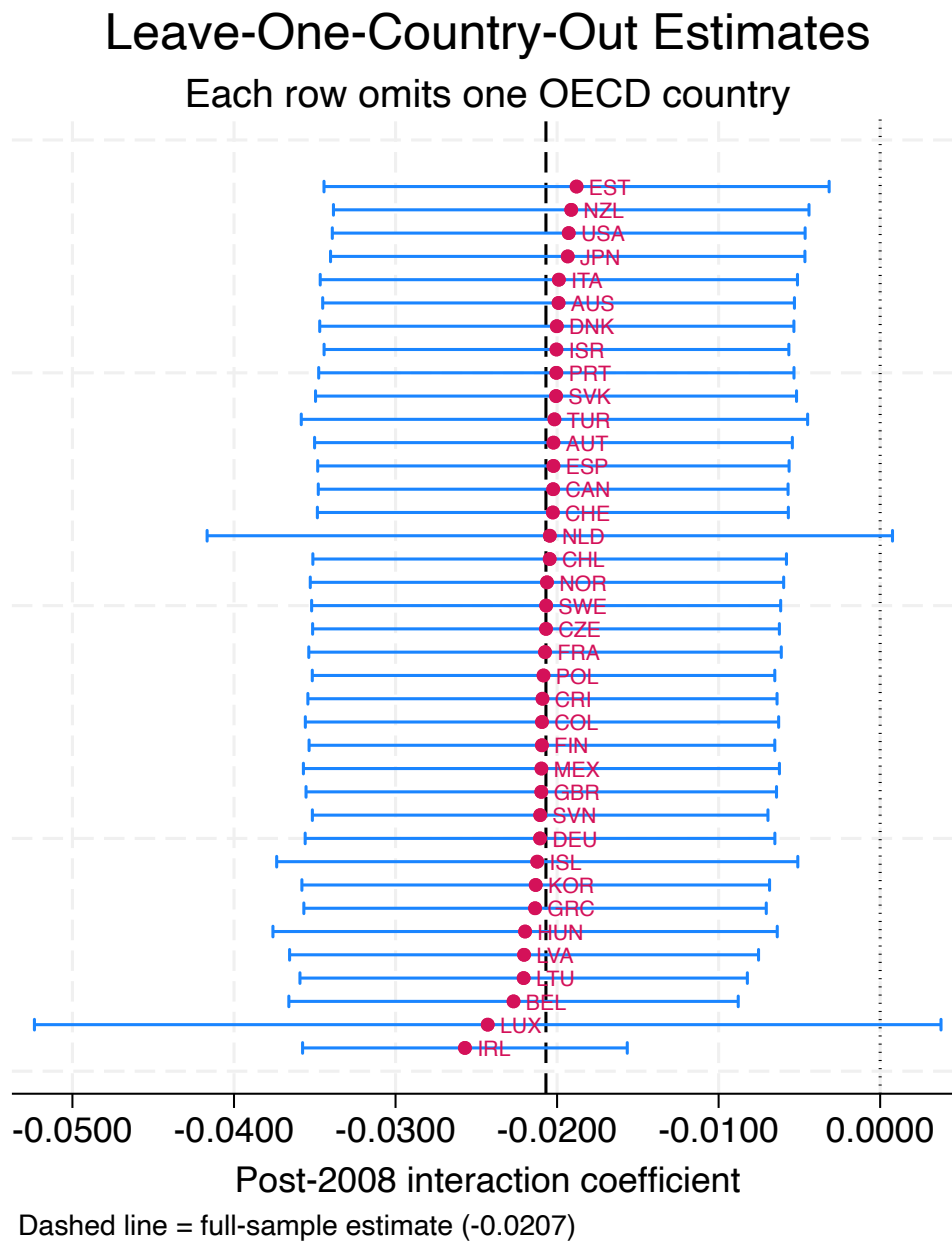


Figure 5: Leave-One-Country-Out Estimates of the Post-2008 Change

Notes: The baseline fixed-effects model is re-estimated 38 times, each time excluding one OECD country. Points show the interaction between lagged FDI and the post-2008 indicator; bars show 95% confidence intervals using country-clustered standard errors.

Appendix D: Reproducibility Statement

The empirical analysis is organised as a reproducible Stata workflow contained in the accompanying replication package. The master file, `00_run_all.do`, defines the project root from the user's current Stata working directory and sequentially executes the data-construction and analysis scripts. Accordingly, the package can be run from different local directories provided that the user first sets the Stata working directory to the root of the replication package.

The file `01_build_clean_data.do` retrieves the required World Bank World Development Indicators series, constructs the OECD-38 country-year panel for 2000–2023, standardises country identifiers, documents the original missing-data pattern, verifies the panel structure, and saves both the downloaded data snapshot and the cleaned analytical dataset. The resulting cleaned panel, `fdi_growth_oecd38_clean.dta`, contains 912 country-year observations across 38 countries.

The file `02_run_analysis.do` loads the cleaned dataset and reproduces the descriptive statistics, correlation matrix, baseline fixed-effects estimates, marginal effects, robustness and sensitivity analyses, diagnostic tests, country-influence analyses, publication tables, figures, and appendix documentation reported in the study. The baseline estimation sample contains 871 observations across all 38 countries from 2001–2023. No missing values are imputed.

The analysis script also performs a final reproducibility audit. Internal assertions verify the number of observations and countries in the cleaned panel, the construction and period of the baseline estimation sample, the sources of excluded observations, and the existence of the principal tables, figures, and appendix files. The final baseline estimates are additionally re-estimated during this audit to confirm that the reported coefficients are reproduced correctly.

The complete publication-version analysis is recorded in `fdi_growth_PUBLICATION_final.log`. The final execution of the master workflow completed successfully, with the reproducibility audit confirming 912 observations and 38 countries in the cleaned panel, 871 observations and 38 countries in the baseline sample, and successful generation of the principal publication outputs.

The replication package is organised into separate directories for the Stata code, data, logs, figures, tables, and documentation. To reproduce the complete workflow, the user sets the Stata working directory to the root of the replication package and executes `02_code/00_run_all.do`. This rebuilds the analytical dataset and regenerates the numerical, tabular, graphical, and documentation outputs used in the manuscript.

Appendix E: Additional Robustness Checks

E.1 Alternative Control Specifications

Table 7: Alternative Control Specifications

Specification	Earlier-period effect	Change	Later-period effect	Obs.
Parsimonious FE	0.018 (0.159)	−0.013 (0.381)	0.006 (0.016)	871
Contemporaneous, no GCF	0.024 (0.022)	−0.017 (0.128)	0.007 (0.010)	871
Baseline contemporaneous	0.026 (0.001)	−0.021 (0.006)	0.006 (0.014)	871
Lagged controls, no GCF	0.025 (0.015)	−0.017 (0.114)	0.008 (0.004)	869
All macro controls lagged	0.024 (0.004)	−0.017 (0.058)	0.007 (0.004)	869
Lagged controls + convergence	0.028 (0.001)	−0.018 (0.052)	0.010 (0.001)	869

Notes: Parentheses contain p-values. All specifications include country and year fixed effects. The conditional-convergence specification additionally controls for lagged log real GDP per capita.

E.2 Candidate Break-Date Diagnostics

Table 8: Candidate Break-Date Profile for the FDI Slope

Later-period start	Earlier effect	Change	Pointwise p	Bonferroni p	Later effect	Wald
2005	0.019	−0.012	0.520	1.000	0.007	0.42
2006	0.025	−0.018	0.397	1.000	0.007	0.73
2007	0.022	−0.015	0.416	1.000	0.007	0.68
2008	0.043	−0.037	0.015	0.169	0.006	6.46
2009	0.026	−0.021	0.006	0.070	0.006	8.37
2010	0.024	−0.018	0.036	0.393	0.006	4.75
2011	0.025	−0.020	0.028	0.305	0.005	5.25
2012	0.021	−0.016	0.071	0.778	0.005	3.46
2013	0.021	−0.015	0.080	0.885	0.005	3.23
2014	0.020	−0.015	0.089	0.977	0.005	3.05
2015	0.023	−0.018	0.019	0.204	0.005	6.07

Notes: Each row re-estimates the baseline country- and year-fixed-effects specification using the listed year as the first year of the later period. Standard errors are clustered by country. The Bonferroni p-value adjusts for the 11 candidate dates. The bold row has the largest cluster-robust Wald statistic.

Figure 6 plots the estimated change in the FDI–growth association across alternative candidate dates for the beginning of the later period. Figure 7 reports the corresponding cluster-robust Wald statistics.

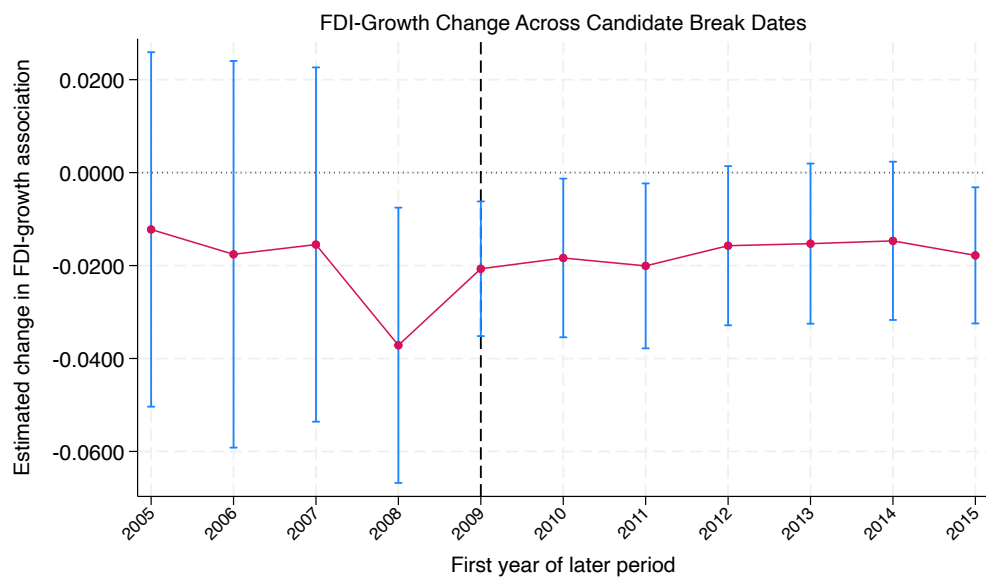


Figure 6: FDI–Growth Change Across Candidate Break Dates

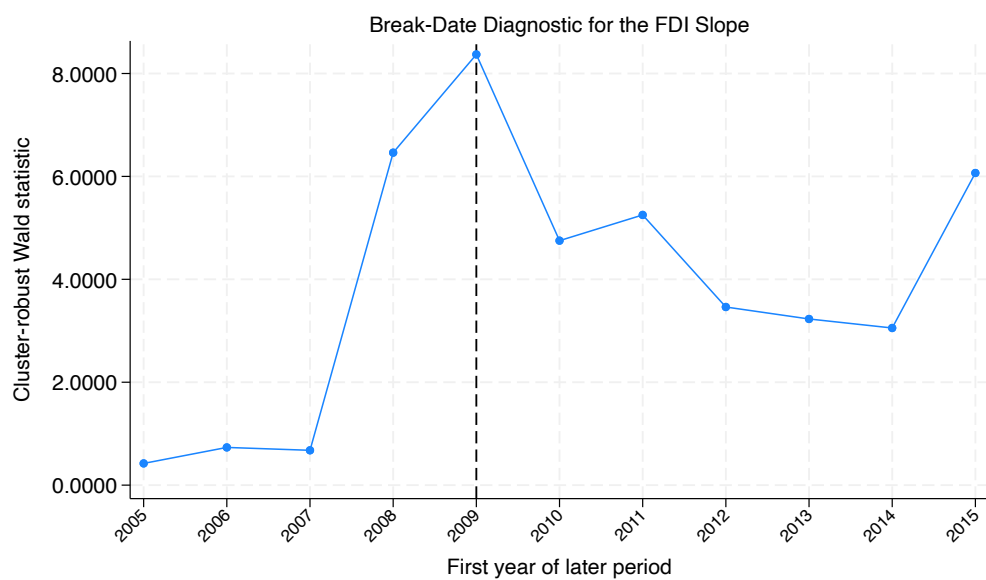


Figure 7: Break-Date Diagnostic for the FDI Slope