THE TAX COMPETITION IN TURBULENT TIMES: THE RACE TO THE BOTTOM IN EUROPEAN OECD ECONOMIES

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This paper examines the effectiveness of competitive tax policies in attracting foreign direct investment (FDI) within European OECD economies, considering the role of corporate income tax as a key instrument. Beyond statutory tax rates, the analysis incorporates tax base breadth and tax incentives, which are crucial tools employed by national governments to influence FDI flows, more specifically, effective average tax rate (EATR). This resulted in a "race to the bottom" for tax competitiveness. However, the success of these competitive tax policies must be assessed in the context of economic turbulences, including the 2007–2009 Global Financial Crisis, the 2010–2014 Debt Crisis, and the 2020–2021 Pandemic crisis. The research analyses whether the impact of tax competition on FDI diminishes in times of turbulent environment. To address this, the research employs subsamples covering different (crisis) periods, applying Panel-Corrected Standard Errors (PCSE) to ensure robust estimation. Findings indicate that the effectiveness of tax competition in attracting FDI declines during crises, suggesting that economic shocks have a stronger influence on FDI inflows than tax policy changes. This highlights the need for policymakers to consider broader macroeconomic stability alongside fiscal incentives when designing tax policies to attract investment.

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1 Introduction

The integration of the EU's single market and globalization has reinforced the four fundamental freedoms, particularly enhancing capital mobility (Radaelli & Kraemer, 2008; Genschel & Schwarz, 2011; Rixen & Schwarz, 2012; Glavaški & Beker Pucar, 2020). This has intensified tax competition, as government adjust tax policies – primarily by lowering rates – to attract foreign direct investment (FDI) and retain mobile tax bases (Cozmei, 2015). A key aspect of this competition is "race to the bottom" (Devereux et al. 2002). While statutory tax rates shape investment decisions, corporate tax system also include investment incentives, deductions, depreciation allowance, and credits, creating gaps between nominal and effective tax rates (Gale & Samwick, 2014; Bénassy-Quéré et al. 2005). To enhance FDI attractiveness, governments frequently reduce not only statutory rates but also modify tax bases, thereby lowering effective average tax rate (EATR) (Auerbach, 2013; Egger et al. 2009; Heshmati et al. 2010). For investors, the effective tax burden on corporate profits is a decisive factor in location choices (Barrios et al. 2014; Devereux & Sørensen, 2006). Consequently, tax competition has become a key determinant of cross-border capital flows, influencing national policies and global investment patterns (Glavaški et al. 2022; Beljić et al. 2023).

The effectiveness of tax competition in attracting foreign direct investment (FDI) has been further challenged by series of negative external shocks, including the 2008 Global Financial Crisis, the 2010-2014 Sovereign Debt Crisis, and the 2020 Pandemic Crisis (Avi-Yonah, 2019; Genschel & Seelkopf, 2016; Eroglu, 2015; Elali, 2009;**). These crises have significantly disrupted economic stability, leading to slower economic growth, rising unemployment, and a decline in FDI flows (Beljić & Glavaški, 2021; Stojkov et al. 2022). As a result, tax policies that were effective in pre-crisis periods may no longer yield the same results in stimulating investment flows. Given these complexities, this paper focuses on examining how tax competition strategies evolved 22 European OECD economies between 1998-2021, with particular emphasis on impact of the crisis mentioned and the sensitivity of FDI movements in crisis conditions. This goal is analyzed using Panel-Corrected Standard Errors (PCSE)** estimator to encompass heteroskedastic, autocorrelated and/or contemporaneously correlated disturbances**. Namely we applied PCSE method to analyze EATR changes impact on FDI inflows for**

four periods: (a) the original sample for the period 1998-2021 and three subsamples (b) the first, covering a relatively stable period in terms of crises from 1998 to 2007; (c) the second, covering global instabilities, as well as the Sovereign Debt Crisis that affected Eurozone (2008-2014); the third, covers the period including the Pandemic Crisis (2015-2021)**. This study aims to provide a deeper understanding of the resilience and adaptability of tax competition as a tool for attracting FDI in times of economic turbulence. Thus, the main hypotheses of the paper are:**

Hypothesis (*H1*): *There is a negative relationship between EATR and FDI inflows in European OECD economies in the period 1998–2021.*
Hypothesis (*H2*): *The impact of EATR on the FDI inflow in the long run for EU economies is lower in time of economic turbulences (economic crisis).*
The reminder of the paper is organized as follows, after the Introduction part, the Section 2 represents theoretical background about economic turbulences – crisis condition and EATR and FDI changes. Section 3 explained used methodology. In Section 4 the main results of the paper are presented. In the last part, concluding considerations were made.

2 Theoretical framework: EATR and FDI in time of crisis

Starting in 2008, European OECD economies experienced economic turbulence in the form of the Global Financial Crisis of 2008-2009; then, the Eurozone sovereign debt crisis of 2010-2014 (especially the economies of the PIIGS) and finally the Pandemic Crisis (2020-2021). The Global Financial Crisis represents one of the most severe economic crises since the Great Depression of 1929 to date. It began in the US with the collapse of the subprime mortgage market. Shortly thereafter, the crisis spread from the financial market to the real sector through a domino effect. The crisis quickly spread globally, causing a decline in economic activity, rising unemployment, and a decline in investment. The public debt crisis in the Eurozone followed due to of the Global Financial Crisis, when many Eurozone economies, especially the peripheral economies of the eurozone – the PIIGS (Portugal, Ireland, Italy, Greece, Spain) faced difficulties in servicing their (public) debts. The last in the series of crises of the observed period is the Pandemic Crisis. It began in late 2019 with the emergence of the COVID-19 virus (health shock) and lasted throughout 2020 and 2021. This crisis episode had far-reaching global effects with a complex

cause-and-effect chain, including repercussions on various aspects of society and the economy (Beker Pucar, 2024). Therefore, governments responded with a combination of monetary and fiscal measures, which mitigated the initial shocks, however, the long-term consequences of increased inflation, uncertainty in the labor market, and changes in global investment flows are still present.

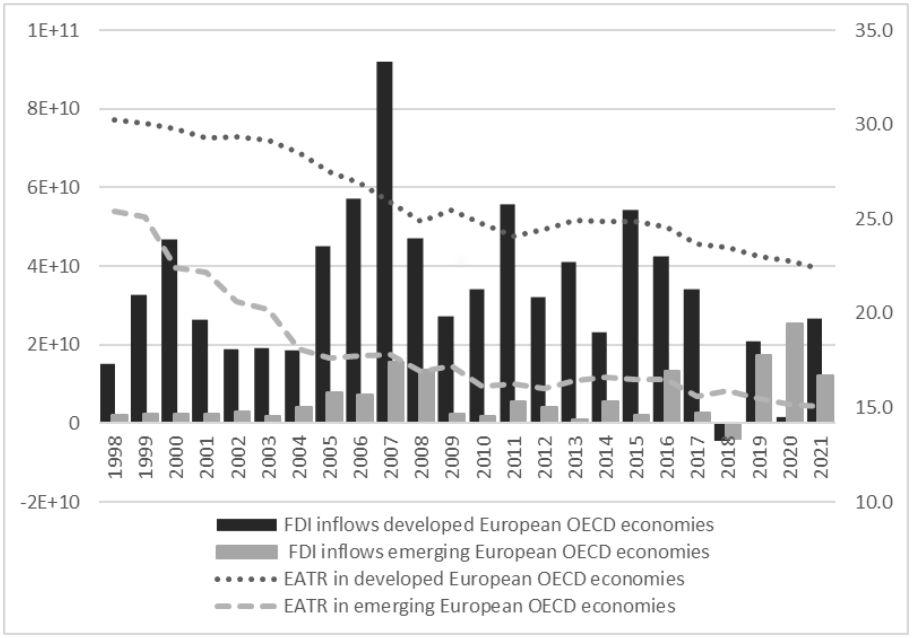

Figure 1: FDI inflow trends and EATR changes in European OECD economies in the period 1998-2021

Source: authors' view based on *World Bank data.*

Figure 1 shows the FDI inflows for developed European OECD economies and emerging economies in the period from 1998 to 2021, which includes the analyzed crisis episodes. Up until 2007, when FDI inflows peaked (seen on the primary axis), most of the economies under observation recorded a rise in FDI inflows. This upward trend in FDI inflows was accompanied by a decline in EATR in both groups of European OECD economies. Namely, from the beginning of the observed period until 2007, EATR decreased (from 27.9 on average in 1998 to 21.8 in 2007). After 2008, the trend of declining EATR (shown on the secondary axis) persisted due to the "race to the bottom" for tax competitiveness. However, FDI inflows decreased significantly in the years of the crisis. A decrease in FDI inflows, as well as FDI

outflows, was recorded in 2008 and 2009, because of the outbreak of the Global Financial Crisis. This was followed by a short-term growth of FDI inflows, given that some European economies (Eurozone members) were also affected by the Sovereign Debt Crisis, which again led to a decrease in FDI inflows. In 2018, most of the observed economies recorded FDI outflows, due to the tensions between USA and China, as well due to BREXIT. The Pandemic Crisis led to a decrease in FDI inflows too, especially in emerging economies. As part of the descriptive analysis, Figure 1 shows the movement of FDI, therefore, European OECD economies were affected by a series of crises in the observed period that caused a decline in FDI inflows, regardless of the measures taken by economic policymakers that implied a decrease in EATR (Figure 1).

3 Methodology

For the purposes of the conducted research, and with the aim of obtaining robust estimates, the Panel-Corrected Standard Errors (PCSE) method was used. Namely, Beck & Katz (1995) recommend the use of this model, considering that it allows for the control of heteroscedasticity, and is also resistant to cross-sectional dependence – which leads to more precise estimates. The PCSE method is adequate since it is robust in panels with a shorter time dimension. The model specification can be written as follows:

$$y_{it} = b_0 + b_1 X_{it} + b_2 D_i + \mu_i + \Lambda_t + u_{it} \quad (1)$$

where y_{it} is the dependent variable for economy *i* and time *t*. X_{it} represents the independent determinants for *i* at time *t*. D_i represents an artificial variable in the model used to account for groups of economies and/or deviations in the empirical data; μ_i represents individual effects; time effects are represented by Λ_t, while u_{it} represents stochastic disturbances.

The estimated model(s) can be written as follows:

$$fdi_{it} = \alpha + efec_{it}\beta_{it} + u_{it} \quad (2)$$

where fdi_{it} represents the FDI inflow expressed in dollars (source: World Bank data), while $efec_{it}$ represents the EATR (source: EU project effective tax levels using the Devereux/Griffith methodology).

4 Results and discussion

In the chapter that includes a descriptive analysis of the key variables, it is shown that the European OECD economies were affected by the Global Financial Crisis (2008-2009), the Eurozone Sovereign Debt Crisis (2010-2014) – especially the PIIGS economies, and the Pandemic Crisis (2020). National governments adjusted fiscal strategies to mitigate the recessionary effects of the crisis. Namely, by using tax incentives in the form of lowering the EATR (as one of the key instruments for attracting FDI), economic policymakers sought to attract FDI – thereby directly affecting economic growth. However, given FDI is the one most vulnerable to crisis situations, the question of whether tax policy measures are efficient in drawing the FDI into turbulent times emerges (Figure 1). To demonstrate the efficacy of taxation policies in turbulent times—that is, the achievement of tax competitiveness for the purpose of attracting FDI—the period of crises is therefore incorporated into the model(s). Due to the spillover effects of the aforementioned crises on European OECD economies, the original sample (1998-2021) is divided into three subsamples: the first, covers a relatively stable period in terms of crises from 1998 to 2007; the second, covers global instabilities, as well as the public debt crisis that affected Eurozone (2008-2014); the third, covers the period that includes the Pandemic Crisis (2015-2021).

Table 1: Homogenous results for PCSE for 22 European OECD economies in four (sub)periods

Sample (a)	22 European OECD economies for homogenous coefficients from 1998-2021		
Dependent variable: **FDI**	Coefficient β_i'	PCSE Standard Error	*p*-value
EATR	-1.39	3.30	0.000
Constant	-8.45	7.10	0.234
R^2	0.0238		
Wald chi2	17.76		
Number of observations	524		

Sample (b)	**22 European OECD economies for homogenous coefficients from 1998-2007**		
Dependent variable: **FDI**	Coefficient β_i'	PCSE Standard Error	*p*-value
EATR	-1.58	6.00	0.008
Constant	-1.55	1.12	0.165
R^2	0.0321		
Wald chi2	6.96		
Number of observations	216		
Sample (c)	**22 European OECD economies for homogenous coefficients from 2008-2014**		
Dependent variable: **FDI**	Coefficient β_i'	Standard Error	*p*-value
EATR	-1.55	4.37	0.000
Constant	-8.24	7.44	0.268
R^2	0.0289		
Wald chi2	12.51		
Number of observations	154		
Sample (d)	**22 European OECD economies for homogenous coefficients from 2015-2021**		
Dependent variable: **FDI**	Coefficient β_i'	Standard Error	*p*-value
EATR	-1.13	4.30	0.009
Constant	-3.86	1.13	0.733
R^2	0.0999		
Wald chi2	6.89		
Number of observations	154		

Source: Authors' own calculation based on *Stata 15*.

The homogeneous coefficients obtained using PCSE are shown in Table 1 (panel (a); (b); (c); (d)). Based on the results obtained, it can be concluded that in all four analyzed (sub)samples a statistically significant negative relationship was found between the EATR and FDI. Such a relationship is expected since it is in line with economic theory and is also in line with previously obtained empirical results (Glavaški et al. 2022; Beljić et al. 2023). The analysis of the whole sample, encompassing both stable periods and turbulent times, reveals a negative relationship of -1.39 between EATR and FDI (confirmation of Hypothesis *H1*) (Table 1, panel (a)). However, to examine the impact of turbulent circumstances on tax competition's capacity to attract FDI, we divided the original sample into three distinct subsamples. As previously pointed out, there is a negative relationship between EATR and FDI throughout a particularly stable, crisis-free period. This relationship is also greatest (-1.58; Table 1, panel (b)), indicating that FDI is most sensitive to fluctuations in EATR. On the other hand, when crisis conditions such

as the Global Financial Crisis (2008-2010) and the Sovereign Debt Crisis (2010-2014) are incorporated into the model, the coefficient is lower (-1.55; Table 1, panel (c)), suggesting that tax competitiveness's ability to draw in FDI is weakened during a crisis. Furthermore, it was investigated how sensitive FDI was to variations in EATR levels, when an exogenous health shock raised. Namely, statistically significant negative relationship was detected in the period covering the Pandemic Crisis (-1.13; Table 1, panel (d)), however it is the smallest compared to the other analyzed periods (Table 1, panel (b); (c)). This suggests the conclusion that policy makers that use tax competition for attracting FDI have less maneuver when turbulent years are considered. Namely, the obtained estimates show that a decrease in EATR by 1% leads to an increase in FDI by 1.58% in the pre-crisis period, while in crisis circumstances a decrease in EATR by 1% leads to a smaller increase in FDI of 1.55% and 1.13% (respectively). The above leads to the conclusion that FDI is more sensitive to crisis circumstances than to changes in tax strategies (i.e. achieving tax competitiveness) (confirmation of Hypothesis *H2*).

5 Conclusions

Over the past two decades, European OECD economies have seen exogenous shocks that have impacted on tax strategies and their effectiveness in luring FDI. Firstly, economic policymakers faced the Global Financial shock in 2008, followed by the Sovereign Debt Crisis in 2010-2014, especially in Eurozone members. Secondly, the pandemic-induced shock that led to border closures, difficult cooperation, high and rapidly rising uncertainty during the Pandemic Crisis, while FDI flows were significantly affected. Therefore, the effect of the EATR on FDI inflows in European OECD economies is examined in this research, with particular attention to the relationship when years of economic turbulence are included in the model. The research findings suggest that the influence of EATR decreases on FDI is diminished during crisis periods compared to years free from external shocks. Namely, the main conclusions of the paper are as follows: (a) The results of the Panel-Corrected Standard Errors (PCSE) model on a sample of 22 European OECD economies over the period 1998-2021 confirm that there is a negative relationship between EATR and FDI inflows. (b) In a sample of a generally stable period, the PCSE indicates that the relationship is most pronounced, demonstrating that tax competition possesses the greatest capacity to attract FDI. (c) Incorporating economic disturbances such as the Global Financial Crisis and Sovereign Debt Crisis

into the model reveals that policymakers' options for employing tax competition are constrained. (d) Furthermore, when the Pandemic Crisis is incorporated into the model, the capacity of tax competition to attract FDI is diminished, as the flow of FDI is primarily influenced by the effects of the crisis.

The results demonstrate that economic policymakers' capacity to implement current tax policies in the context of attracting FDI during times of crisis is constrained by exogenous forces. Specifically, when crisis conditions worsen, tax policy' capacity to draw FDI declines since, during periods of economic turbulence, the crisis—rather than tax policies—has the greatest impact on FDI flows. Policymakers ought to consider about broadening their strategy for luring FDI to strike a balance between tax competitiveness and macroeconomic stability, especially during turbulent times. This could entail combining competitive tax rates with non-tax incentives like worker quality, regulatory efficiency, and infrastructure upgrades, which remain to be beneficial even in situations where fiscal resources are limited. Furthermore, the adoption of flexible and adaptive tax structures – capable of to economic cycles – can help mitigate the adverse effects of exogenous shocks. Such strategies would allow governments to preserve the attractiveness of their tax system while enhancing resilience to future crisis, thereby sustaining FDI inflows even when traditional tax competition loses its efficiency.

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