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The pressure is on: how geopolitical tensions impact institutional fiscal and external stability responses*

António Afonso† José Alves‡ Sofia Monteiro§

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Abstract

In this article, we study the effects of geopolitical risks and world uncertainty on time-varying fiscal and external sustainability coefficients. We use Schlicht's (2021) methodology to estimate time-varying fiscal and external sustainability coefficients for the EU for 27 economies between 2001Q4 and 2022Q3. While fiscal sustainability coefficients derive from the government revenues and expenditures relationship, external sustainability coefficients were computed from the exports' responses to changes in imports. Our results show that geopolitical risks are always associated with lower fiscal and external sustainability, although with a stronger effect when took into consideration the home geopolitical risk. Moreover, the effects of geopolitical tensions are much stronger on external accounts' sustainability than on fiscal sustainability. The magnitude of GPR detrimental effects on external sustainability can be 3 to 6 times higher, approximately, when compared to public finances' sustainability. Lastly, geopolitical tensions in border countries have a negative spillover effect on the sustainability of domestic external accounts.

JEL: E62; F15; F42; H62; H87
Keywords: Economic integration; Geopolitical risks; Fiscal sustainability; External sustainability; Time-varying coefficients

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1. Introduction

From an institutional perspective, it is relevant to assess under which conditions notably governments and countries can provide the adequate responses and institutional frameworks to ensure that public finances thread a sustainable path, and to help mitigating efficiently external imbalances. Indeed, important fiscal and external imbalances can exert unwanted pressures on the market funding cost of the government and have negative impacts on the level of external competitiveness of an economy.

Typically, geopolitical risks may impact on the capacity of institutions to manage public finances or to foster foreign trade, and to deal with fiscal and current account imbalances. Therefore, in this article, we study the effects of geopolitical risks and world uncertainty on time-varying so-called fiscal and external sustainability coefficients.

In our paper we use Schlicht's (2021) methodology for the European Union (EU), a rather integrated trade area, for the EU 27 economies between 2001Q4 and 2022Q3, to estimate fiscal and external sustainability coefficients, also a contribution to the literature. Therefore, we estimate fiscal sustainability coefficients via the relationship between government revenues and expenditures, and we estimate external sustainability coefficients by analysing exports responses to changes in imports.

Our results allow us to conclude that geopolitical risks are always associated with lower fiscal and external sustainability, although with a stronger effect when took into consideration the home geopolitical risk. Moreover, the effects of geopolitical tensions are much stronger on external accounts' sustainability than on fiscal sustainability. The magnitude of GPR detrimental effects on external sustainability can be 3 to 6 times higher, approximately, when compared to public finances' sustainability. Further, under recession periods, when countries are more vulnerable to global adverse events, GPR exhibits a strong negative impact on both fiscal and external sustainability.

In addition, for the home country's geopolitical risk, a negative output gap in the home economy coupled with a positive output gap in the border country have a negative and highly significant effect of fiscal sustainability. Finally, we find that geopolitical risk in the border country influenced the home external accounts sustainability as well as the difference between home and border countries' time-varying fiscal and external sustainability coefficients. This discrepancy may be justified by the fact that increased turmoil in home countries, relative to border nations, may prompt higher government spending or tax revenue challenges, leading to deteriorating public finances.

However, greater differences in geopolitical risk positively impact external sustainability, as heightened instability in border countries limits the home country's import intentions, benefiting its external sustainability. Hence, the higher is the geopolitical risk in the border country the higher is the difference between external sustainability between home and border country. Therefore, the proximity between countries emerges as a significant factor influencing external sustainability, particularly when accounting for geopolitical tensions. This underscores the presence of spillover effects among neighbouring nations. Such interconnections are notably pronounced in economically integrated regions like the European Union, as reflected in our study.

This study is organised as follows. Section 2 presents the literature review on fiscal and external sustainability, and how geopolitical risks and uncertainty may impact macroeconomic conditions, namely public finances and external accounts. In Section 3 we discuss the adopted methodology and the data used in our analysis. Section 4 reports and analyses the results. Section 5 summarizes the main conclusions and provides some policy conclusions.

2. Literature Review

2.1. Fiscal and external sustainability

There is a large body of literature that has focused on the study of budgetary and external sustainability.

Fiscal sustainability is an essential topic in economics and public policy due to its profound impact on economic growth (Golpe et al., 2023). Typically, the literature proposes two lines of research to evaluate the conditions that need to be met in order to fulfil the intertemporal budget constraint (IBC): the backward-looking and the forward-looking approaches. While the backward-looking approach, based on the fiscal reaction set up of Bohn (1998), examines whether previous government budgetary values have been consistent with the IBC, the forward-looking approach, as mentioned by Canzoneri et al. (2001), assesses whether the current and projected values for public finances are in line with the requirements of the intertemporal budget constraint (Afonso et al., 2019; Debrun et al., 2019).

The backward-looking approach for evaluating fiscal solvency is typically subdivided into two categories: (1) studies that examine the stationarity and the cointegration between government revenues and expenditures, and (2) the so-called fiscal reaction functions, which show how the primary balance responds to previous changes in

government debt. Regarding the former, the literature has shown that there has not been a sustainable path in the relationship between government revenues and expenditures, which indicates that countries mostly do not meet the IBC requirements (Hakkio and Rush, 1991; Afonso, 2005). Furthermore, Afonso and Rault (2010) report that fiscal sustainability is ensured only in certain sub-periods for the EU-15 economies, which is consistent with the overall absence of fiscal sustainability.

The forward-looking method looks for a Ricardian or passive fiscal regime when shocks in the primary surplus lead to a decrease in government debt. This method uses projections to evaluate how well current and future fiscal policy stances match the IBC.

However, both approaches have drawbacks. The studies that make a backward assessment overlook the possibility that future fiscal policy may differ from previously observed trends. On the other hand, the prospective approach disregards the past and assumes that all future actions are consistent with the IBC, depending on how credible the government's commitment is perceived to be to that strategy (Afonso et al., 2023a).

Furthermore, the institutional influence on the fiscal response to escalating public debt constitutes a pivotal consideration in the examination of fiscal sustainability. Notably, fiscal responses have experienced a shift to government debt growth analysis since the ratification of the Maastricht Treaty and the adoption of the Euro. Consequently, there arises a pertinent discourse on the imperative to reevaluate the benchmark values for public debt downward. Such a reassessment becomes crucial for fostering heightened stability within a monetary union as the Euro-area, particularly in light of the unavailability of monetary policy as a tool to support fiscal solvency (Golpe et al., 2023).

Moreover, fiscal rules centred on expenditure behaviour appear to exert a more pronounced impact on fiscal sustainability (Afonso and Jalles, 2017). However, when scrutinizing economies within the Euro-area against those outside, fiscal sustainability does not manifest uniformly for those sharing the same currency, notably in the case of southern and peripheral Euro-area economies (Lee et al., 2018). Saadaoui et al. (2024) showed that for the UK, Sweden and the US, long-run debt sustainability is not rejected, however, for Canada Italy and Portugal the results are equivocal.

Regarding external sustainability, research can also be divided into three main areas: (1) the analysis of current account balances, trade balance, and external debt dynamics using panel data and time-series econometric methodologies; (2) the exploration of the economic factors that shape the trajectory of external debt growth; (3) and the evaluation of the repercussion of external debt trajectories on the economy. Examples of the

application of the former are Bajo-Rubio et al. (2014) who showed that in Austria, Canada, Italy, and New Zealand, current account balances were sustainable, but the other economies within the OECD did not give the same results. Further, the authors demonstrated the importance of evaluating the sustainability of the current account for economies that are part of the currency union such as the eurozone which are unable to use exchange rate regulation to address accumulated imbalance external accounts. Accordingly, the structural disruption that certain economies experienced during the European Economic and Monetary Union (EMU) transition period lends credence to this reasoning. In order to evaluate the sustainability of the current account (CA) balance, net international investment position (NIIP), and net external debt (NED), Afonso et al. (2019) used both time-series and panel-data stationarity tests of current account balance-to-GDP ratios and cointegration tests of exports and imports of goods and services.

2.2. Geopolitical risks and uncertainty

Geopolitical tensions arising from territorial disputes, power struggles, governmental changes and ideological differences among nations carry profound implications on the global stage (Drakos & Kallandranis, 2015; Bilgin et al., 2020, Gutmann et al., 2023). This global instability is heightened by the growing integration and interdependence of economies. For instance, Bobasu (2023) demonstrated that larger uncertainty among the eurozone's partners can significantly impact the euro area economy. This influence may be attributed to the rapid dissemination of information facilitated by advancements in information and communications technologies (Monteiro et al., 2023) or due to geographic proximity (De Groot, 2010). Consequently, developments in one country possess the potential to transcend borders, exerting a profound impact on the political and economic stability of neighbouring nations. Within this context, the intricacies of geopolitics emerge as a pivotal determinant influencing the stability and developmental trajectories of countries, as noted by Afonso et al. (2023b).

Geopolitical dynamics have been a subject of analysis in the literature; however, this is not a recent concept. In the early 20th century, the term "geopolitics" was introduced by Rudolf Kjellén, a Swedish political scientist. Kjellén's groundbreaking contribution involved recognizing that geography transcends being merely a setting for international politics; instead, it serves as a fundamental determinant of state behaviour (Björk, 2021). This insight gained particular significance during the two World Wars and the Cold War. Today, in the contemporary geopolitical landscape, Kjellén's observations remain highly

relevant, evident in the escalating tensions between China and the United States since 2018, the global consequences of the Covid-19 pandemic in 2020 (Bouri et al., 2023), the emergence of new international conflicts exemplified by the war in Ukraine in 2022 (Shen and Hong., 2023; Khan et al., 2023; Mokdadi et al., 2023; Johnson et al., 2023; Zhukov, 2023), the resultant strain on relations between NATO members and Russia, and the Middle East conflicts in 2023. These events underscore the enduring influence of geopolitics on shaping international dynamics.

The implications of adverse geopolitical events are profound and multifaceted. These repercussions span from the loss of human lives in armed conflicts to the depletion of natural resources, heightened corruption, and famine (Martin et al., 2008). Economic consequences further compound the impact, encompassing the loss of jobs (Bloom, 2009; Pham et al., 2023), destruction of capital stocks, increased military, and defence spendings, diminished bilateral transactions and trade openness (Pham and Doucouliagos, 2017, Gupta et al, 2019; Caldara and Iacoviello, 2022; Campos et al, 2023), reduced output, heightened bond spreads (Balli et al., 2022) and credit default swaps (Afonso et al. 2023b), stock market instability, elevated risk premia (Ludvigson et al., 2019; and Beckmann et al., 2019), the unpredictability of stocks (Salisu et al., 2022), the rise of commodities prices (especially oil prices, according to Ivanovski and Hailemariam, 2022), among other factors.

A case in point is the conflict between Russia and Ukraine in 2022, which triggered a notable upswing in commodity prices, particularly for cereals, oil, and energy (Bouri et al., 2023). This inflationary crisis resulted in shortages of food supplies, primarily affecting impoverished nations, and concurrently contributed to a global escalation of social inequalities and poverty (Liadze et al., 2022; Chen et al., 2022; European Union, 2023).

Furthermore, the uncertainty of the future global economy and political instability have a large impact on macroeconomic developments, which is recognized as a significant factor contributing to global economic slowdowns (Handley and Limao, 2012; Hoang et al., 2023). Notably, Jha et al. (2009) illustrated that policy responses to macroeconomic uncertainties during the 2010s in Asia resulted in a fiscal burden, contributing to heightened public debt. This was exacerbated by the pronounced dependence of Asian economies on the dynamics of oil price shocks during this period. The resultant debt stress was originated from increased public spending, diminished revenues, and consequently, a higher primary deficit. Moreover, Fernández-Villaverde et al. (2015) analyzed the

escalation of fiscal deficits and public debt amid periods of uncertainty. Expanding on this, Afonso et al. (2022) emphasized that globally unexpected shocks and uncertainty yield enduring consequences in the form of increased indebtedness for public finances. Nguyen et al. (2023) demonstrated the relevance of world economic uncertainties in determining country-specific fiscal balances. Their study, covering 143 countries between 1990 and 2019, revealed that these uncertainties adversely affect fiscal balances irrespective of the level of economic development. Specifically, the authors established that a 0.1-point increase in the world uncertainty index leads to a 0.15 percentage point decrease in the fiscal balance as a percentage of GDP.

Traditionally, assessments of geopolitical risk rely on the Geopolitical Risk Index (GPR), as introduced by Caldara and Iacoviello (2022). This index stands out for its robust capabilities in gauging geopolitical risk, offering a broad and comprehensive definition that encompasses various events, including wars and significant economic or climatic crises. Distinguishing itself from indices developed by private entities, the GPR is publicly accessible, transparent in its construction, open to suggestions and criticism, and grounded in a substantial historical database.

An additional indicator relevant for measuring global economic instability and uncertainty is the World Uncertainty Index (WUI), devised by Ahir et al. (2022). This index concentrates on assessing political and economic instability on a global scale and proves valuable due to its meticulous framework and facilitation of data compilation.

3. Empirical approach

3.1. Methodology

As detailed previously, we intend to assess the effects of geopolitical risks on both fiscal and external sustainability coefficients. To address this question, we have followed Schlicht's (2003, 2021) method to obtain time-varying coefficients for the two different sustainability issues as:

$$X_t = \theta_{Ext,t} + \beta_{Ext,t}.M_t + \varepsilon_{Ext,t} \quad (1)$$

$$R_t = \theta_{Fis,t} + \beta_{Fis,t}.G_t + \varepsilon_{Fis,t} \quad (2)$$

where θ, $\beta_{Ext,t}$, $\beta_{Fis,t}$ and ε_t are the time-varying constant term, external sustainability, fiscal sustainability and error-term, correspondingly.

According to Schlicht's (2003, 2021) approach, the time-varying external and fiscal sustainability coefficients are assumed to behave randomly over time. Hence, the Time-Varying Coefficient model assumes that $\beta_{Ext,t}$ and $\beta_{Fis,t}$ (respectively, in (1) and (2)) change slowly and not systematically over time:

$$\beta_{Ext,t} = \beta_{Ext,t-1} + \tau_t \qquad (3)$$

$$\beta_{Fis,t} = \beta_{Fis,t-1} + \pi_t \qquad (4)$$

where τ_t and $\pi_t \sim \mathcal{N}(0, r^2)$.

As it is assumed that coefficients are random walks, the expected value of the coefficient at time *t* is equal to the value of the coefficient in time *t-1*. The changes of the coefficients are denoted by τ_t and π_t, which are assumed to be normally distributed with zero mean and variance r_i^2. The variances r_i^2 are computed using a method of moments estimator, which coincides with the maximum-likelihood estimator for large samples, although it is statistically more efficient and numerically more transparent and straightforward to interpret in small samples. The specifications (1) and (2) are special cases when the variance of the disturbances in the coefficients approaches to zero. Additionally, and in order to estimate equations (1) and (2) in levels, we must ensure that each time-series are stationary in levels, or alternatively, there is a cointegration relationship between those series if they are non-stationary in levels. To do so, we have performed the Augmented Dickey-Fuller unit root test to each time-series and the respective Johansen cointegration test per country. These results are available in tables A3 and A4 on Augmented Dickey-Fuller and Phillips-Perron tests.

After estimating the time-varying coefficients, we analyse the impact of geopolitical risk on both time-varying fiscal and external sustainability coefficients, resorting to OLS-Fixed Effects (OLS-FE) approach, as detailed in equations (5) and (6):

$$\beta_{Fis,i,t} = \alpha_0 + \beta_1 . Geopolitical_{c,i,t} + \beta_n . X_{n,i,t} + \psi_i + \eta_t + \varepsilon_{i,t} \qquad (5)$$

$$\beta_{Ext,i,t} = \alpha_0 + \beta_1 . Geopolitical_{c,i,t} + \beta_n . X_{n,i,t} + \psi_i + \eta_t + \varepsilon_{i,t} \qquad (6)$$

where *Geopolitical* represents the Geopolitical risk or the World Uncertainty Index, c stands for home or border country, X_n is the set of n control variables, ψ and η are the country (i) and time (t) fixed effects, respectively, while ε is the error term. Moreover, we have estimated equations (5) and (6) resorting to Generalized Method of Moments (GMM) to deal with possible endogeneity issues and Weighted Least Squares (WLS), weighting the abovementioned estimations by the inverse of the time-varying standard deviations obtained from equations (1) and (2). However, and due to parsimony reasons, we provide these results upon request since both GMM and WLS estimations are quite close to the ones obtained from the standard OLS-FE.

Additionally, we proceeded with several robustness checks to these regressions, namely by analyzing the geopolitical risks' effects on fiscal and external sustainability sectors for different business cycle phases. Hence, we considered the home country's geopolitical risk or the influence of the border country geopolitical on home country's fiscal and external sustainability coefficients, the effects of the differences in the fiscal and external sustainability magnitudes between the home and border country on home time-varying sustainability coefficients. Lastly, we complemented our analysis with uncertainty indexes as an alternative measure of risk.

3.2. Data

Our study comprises a set of 27 European countries, namely, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, between the period of 2001Q4 and 2022Q3. The selection of these nations is dictated by the data availability.

In this study, we employ pairwise relationships between these 27 economies and each of their neighbours at a time (see the Appendix for further details on the neighbouring relationships). For instance, in the case of Austria, we studied the country's relationship with Czechia, Germany, Hungary, Italy, Slovakia, and Slovenia. We have, therefore, a maximum of 68 home-border country pairs. For example, consider Austria, which shares borders with six countries. This implies a potential of 480 regressions for these paired relationships (80 quarters multiplied by 6 borders). However, there are missing observations in the Geopolitical Risk (*GPR*) variable across the entire sample. In the case of Austria, although we lack Austrian GPR data, we possess the *GPR* of Germany.

Consequently, we can explore the relationship between Austrian fiscal and external sustainability and the geopolitical risk of the neighbouring country, Germany. Conversely, we lack the regression for the fiscal and external sustainability of Germany against the *GPR* of Austria.

Geopolitical risk is the main independent variable in this research. As a proxy to measure this variable, we use the Geopolitical Risk Index (*GPR*), by Caldara and Iacoviello (2022) and the World Uncertainty Index (*WUI*) as developed by Ahir et al. (2022). The GPR index is created by counting the monthly occurrences of phrases linked to geopolitical risk using news-based data. Eleven eminent international newspapers—The Boston Globe, Chicago Tribune, Daily Telegraph, Financial Times, Globe and Mail, Guardian, Los Angeles Times, New York Times, The Times, Wall Street Journal, and Washington Post - were chosen to provide the data (Caldara and Iacoviello, 2022). According to Balcilar et al. (2018), this index is widely recognized for its capacity to capture a broad range of external worldwide issues, including factors such as military threats, conflicts, terror attacks, and trade disputes The *GPR* was collected monthly, and by averaging every four months, the monthly data was converted to quarterly data. The *WUI* index is a metric that uses text mining of the countries' Economist Intelligence Unit's reports to track uncertainty worldwide. It is obtained by calculating the percentage of the word "uncertain" (or its synonyms) in country reports from the Economist Intelligence Unit on a quarterly basis. The percentage is then multiplied by one million to rescale the data. Greater uncertainty is indicated by higher values, and vice versa. Both variables are transformed in logarithms.

In this study, we also incorporate several controlled variables. We included the logarithm of the Real effective exchange rate (*REER*), from the EUROSTAT Database. The *REER* variable generally captures credit risk arising from general macroeconomic disequilibrium. A rise (decrease) in the *REER* indicates real exchange rate appreciation (depreciation), which is projected to increase (decrease) fiscal and external sustainability, as theoretically supported by Afonso et al. (2019). Additionally, we include the logarithm of the harmonized index of consumer prices (*Inflation*), the short-run 3-month interest rate, (*Short-rate*), and the degree of trade openness, measured by the quotient between the sum of exports and imports over GDP (*Openness*). Lastly, we also included two other variables, the government debt as a percentage of GDP (*Debt*) from the EUROSTAT Database, and the output gap, meaning the difference between the actual level of GDP against the full employment level (*Output Gap*).

Table 1 presents the summary statistics of the variables employed in this study. The dataset comprises quarterly frequency observations spanning the period from 2001Q4 to 2022Q3, and it includes more than 2000 observations for each variable for the 27 countries of our study. The time-varying coefficients' average values for fiscal and external sustainability, respectively, are 0.139 and 0.818, with comparatively small standard deviations. This suggests that, on average, a unitary increase in the country's government expenditure (imports) will be matched by an increase of 0.139 (0.818) in its government revenue (exports). For fiscal and external sustainability, respectively, these factors reach their maximum levels at 0.545 and 1.069. The average of *GPR* and *WUI* are both positive and the values are close to the median, indicating distributional symmetry. The standard deviation is relatively low as well for both variables. These variables only report positive observations. The other variables present the usual values.

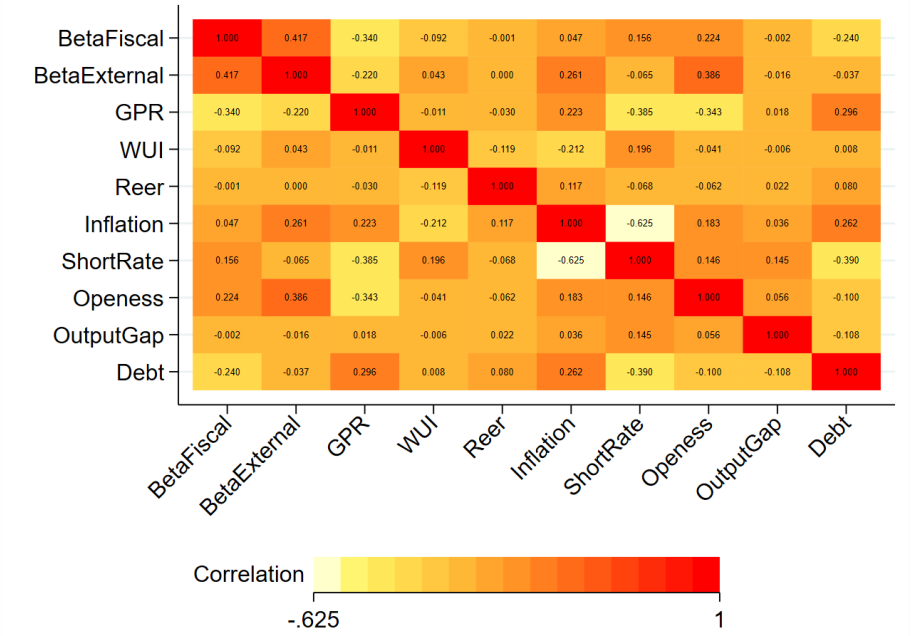
Table 1. Summary statistics

Variable	Mean	Median	Std. Dev.	Min.	Max.
β_{Fis}	0.139	0.128	0.121	-0.152	0.545
β_{Ext}	0.818	0.845	0.176	-0.393	1.069
GPR	0.210	0.104	0.258	0.000	2.201
WUI	0.197	0.166	0.166	0.000	1.433
REER	4.621	4.628	0.073	4.096	4.846
Inflation	4.535	4.581	0.146	3.719	4.970
Short-rate	2.020	1.212	2.903	-0.600	34.20
Openness	120.25	106.93	61.157	45.376	382.47
Output Gap	-0.028	-0.160	2.064	-9.959	11.312
Debt	61.985	59.927	33.119	3.436	209.27

Notes: This table presents the summary statistics of the variables under study for the period of 2001-2022. Specifically, we report the mean, median, Standard deviation (Std. Dev.), the maximum, and the minimum of the series.

The correlation map between the variables under study is shown in Figure 1. As we can see from this graph, a higher positive correlation is shown by a warmer colour (red), whereas a higher negative correlation is represented by a lighter colour (yellow).

Figure 1. Heatmap of Correlations



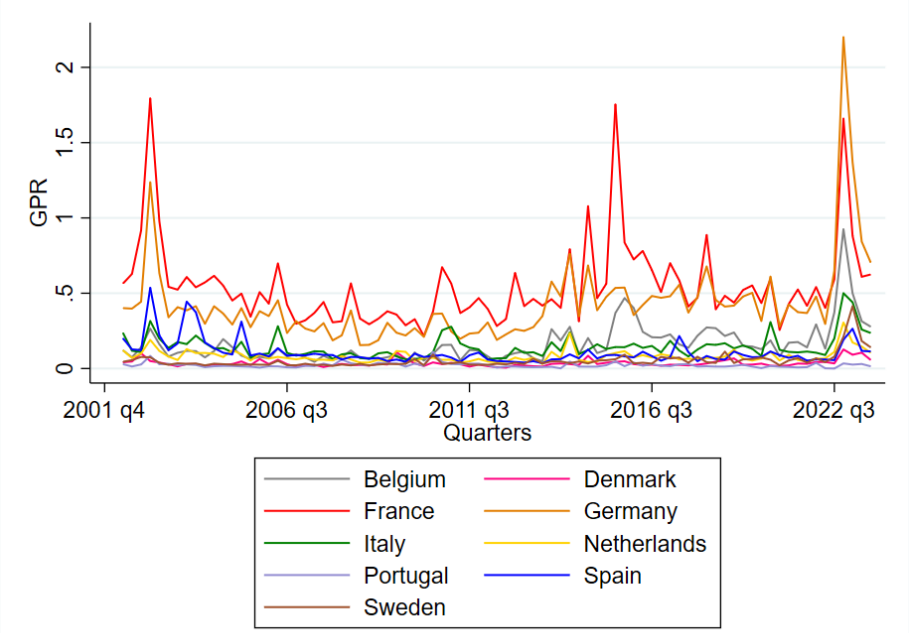
Notes: This figure reports the correlation coefficients between the variables used in this study. Since economies are susceptible to external shocks, this has an impact on countries' sovereign debt risk. A warmer colour means a correlation closer to 1 (red) and a lighter one closer to -1 (light yellow). Source: Author's own calculations.

As expected, the measures of fiscal and external sustainability are negatively correlated with measures of Geopolitical Risk, proxied by *GPR* and *WUI*. This indicates that when the Geopolitical risk increases, the sustainability of public and external accounts decreases. Curiously, the measures of sustainability have a positive and high correlation of 0.417. This is evidence of the twin deficits hypothesis. Further, we highlight the strong and negative correlation presented between the short-term rate and inflation, with a value of -0.625.

In Figure 2, we can observe the evolution of *GPR* for 9 countries of our sample between 2001Q4 to 2022Q3. From this graphical representation, we can conclude that the GPR fluctuates for all countries for the overall sample period but the values are relatively small. We highlight the high peaks in 2002 due to the adjustment period of the EURO, in 2014-2015 due to the sovereign debt crisis in Europe and the aftermath of the Global Financial Crisis, in 2020 due to the Covid-19 pandemic, and in 2022 caused by the war in Ukraine. Furthermore, France and Germany are the countries with the highest peaks variability, especially in the second half of the sample. This is unsurprising given that these nations exhibit a high degree of openness to the global community, serving as benchmarks for international economies. Moreover, their actions are subject to more

intense scrutiny, and events within their international partners possess significant potential to exert a profound influence on their countries.

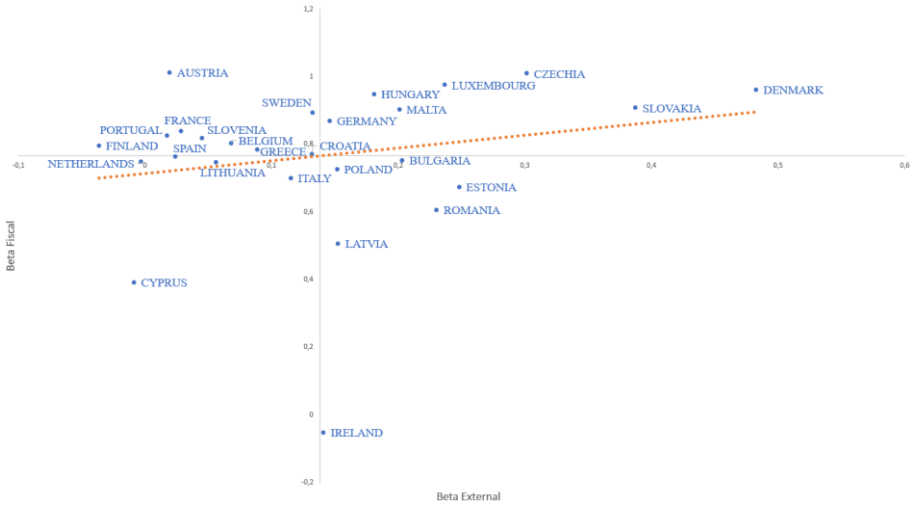
Figure 2. GPR Evolution 2001Q4-2022Q3



Notes: This figure reports the logarithm of Geopolitical Risk Index, for 9 nations from our sample, between 2001Q4 and 2022Q3. Each line represents one Country. Source: Author's own calculations.

Figure 3 illustrates the country's measures of fiscal sustainability against the measures of external sustainability spanning from 2001Q4 to 2022Q3. The graphical representation shows the average values for each variable, with the intersection of the axes occurring at the mean values of 0.1385 for External Sustainability and 0.7660 for Fiscal Sustainability. Upon closer examination of the graphical representation, it is discernible that Denmark, Slovakia, Czechia, Luxembourg, Hungary, Malta, and Germany stand out as countries exhibiting above-average levels of both fiscal and external sustainability. Conversely, a predominant trend is observed among the majority of countries, manifesting above-average fiscal sustainability but below-average external sustainability. This pattern is prominently displayed in the second quadrant of the graph.

Figure 3: Countries' average time-varying Fiscal and External sustainability coefficients from 2001Q4 to 2022Q3



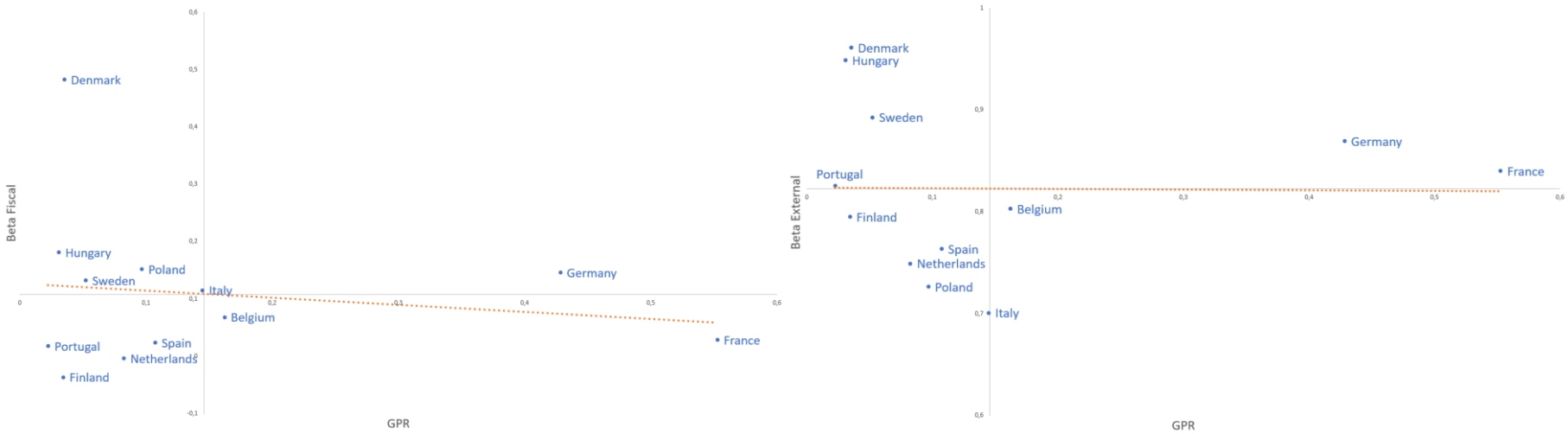
Notes: This figure presents the countries' fiscal sustainability against external sustainability. Each point represents the country's average for the full sample period and the yellow line is the trend line. Source: Author's own calculations.

Figure 4 displays the fiscal sustainability (Panel A) and external sustainability (Panel B) of various countries in relation to their Geopolitical Risk (GPR) over the period from 2001Q4 to 2022Q3.

In Panel A of Figure 4, Denmark stands out with the highest values for fiscal sustainability, coupled with a below-average Geopolitical Risk (*GPR*), signifying a minimal exposure to risk. Meanwhile, Germany emerges as the second-best performer in terms of fiscal sustainability. However, it is noteworthy that Germany exhibits one of the highest *GPR* values, indicating a comparatively elevated exposure to geopolitical risk. This can be attributed to Germany's openness to international trade and its role as a benchmark in the global context. German fiscal sustainability is influenced by multiple factors, but we highlight that the country's exposure to Geopolitical Risk potentially contributes to the maintenance of balanced public accounts, contributing to its superior performance. Portugal boasts the lowest Geopolitical Risk (*GPR*) and demonstrates an average fiscal performance. In contrast, France exhibits the highest *GPR* with an equivalent level of fiscal performance.

Figure 4: Countries' Betas for Fiscal (Panel A) and External Sustainability (Panel B) and GPR from 2001Q4 to 2022Q3

Panel A: Fiscal Sustainability *Panel B: External Sustainability*



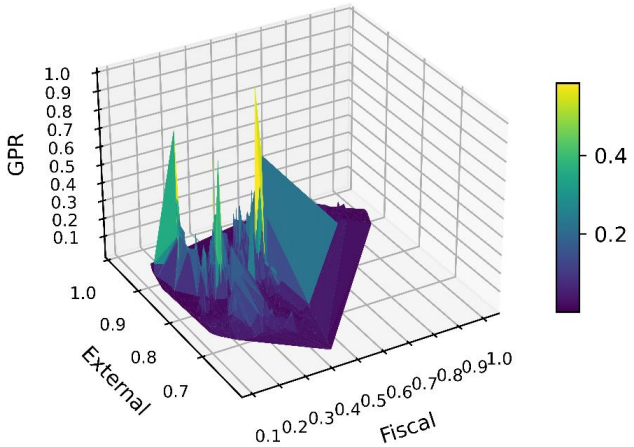
Notes: This figure presents the countries' fiscal sustainability and external sustainability against GPR. Each point represents the country's average for the full sample period and the yellow line is the trend line. For parsimonious the countries considered are Belgium, Denmark, France, Germany, Italy, Netherlands, Portugal, Spain, and Sweden.

Examining Panel B, the positioning of countries within the quadrants remains relatively stable compared to Panel A. Denmark maintains its position as the leader in external sustainability, accompanied by the second lowest *GPR*. Italy exhibits the poorest external accounts balance sustainability but an average *GPR*. Notably, France reports the highest Geopolitical Risk, whereas Portugal reports the lowest. Interestingly, both countries, despite their divergent geopolitical risk profiles, exhibit on-average external accounts sustainability.

Further, we focus our analysis on the interplay between fiscal and external sustainability, in conjunction with the *GPR* throughout the entire sample period. The graphical representation in Figure 5 provides a three-dimensional depiction of these relationships.

Upon closer examination, it becomes apparent that high values of external sustainability align with significantly low values of GPR and average fiscal sustainability. This observation suggests that a low level of Geopolitical Risk is associated with favourable outcomes in terms of external accounts, accompanied by relatively moderate performance in the realm of public account balances. The graphical representation in Figure 5 lends support to the notion that a diminished geopolitical risk is associated with good performances in terms of sustainability.

Figure 5: GPR vs Fiscal and External Sustainability



Notes: This graph is a 3D representation of the time-varying fiscal and external coefficients and GPR, all of them normalized between 0 and 1. Source: Author's own calculations.

4. Empirical Analysis

4.1. Baseline results

In Table 2 we start by analysing the impact of geopolitical risks of both home and border countries on home time-varying fiscal (columns (1) to (7)) and external (columns (8) to (14)) sustainability coefficients. While in Table 2 we present the impact of the home country's GPR, in Table 3, we assess the impact of the border country's *GPR* on time-varying coefficients.

From these baseline exercises, we can conclude that geopolitical risks are always associated with lower fiscal and external sustainability, although with a stronger effect when taking into consideration the home geopolitical risk. Moreover, and comparing the effects of geopolitical on fiscal and external sustainability, the effects of geopolitical tensions are much stronger on external accounts' sustainability than on fiscal sustainability. For instance, from Table 2 we can observe that the magnitude of *GPR* detrimental effects on external sustainability can be 3 to 6 times higher, approximately, when compared to public finances' sustainability. From these main results, we conclude that public authorities must be aware of both internal and external geopolitical risks in order to contribute to a balanced growth path of external accounts.

Regarding the control variables, we obtain the expected sign for the *REER* and for Inflation. In fact, a rise of inflation in the short-run tends to improve fiscal sustainability via increasing nominal revenues while we may consider that public expenditures are expected to be sticky in the short-run, thus explaining the increasing of fiscal sustainability levels (Garcia-Macia, 2023). Moreover, we obtain an expected positive openness degree effect over sustainability coefficients, and the positive impact that higher external trade openness can translate a higher resilience degree of the home economy, then contributing for more sustainable public finances and external accounts. Regarding the Output gap, the negative sign associated with both fiscal and external sustainability may be justified by the procyclicality of fiscal policy. Specifically, the higher is the GDP the higher will be the demand of public spending (or the government willingness to incur in additional spending) thus jeopardizing fiscal sustainability. At the same time, the positive output gap might stimulate more imports given the higher value of economic activity against its potential value.

Table 3 provides the outcomes for the impact of geopolitical risk of the border country on the fiscal and external sustainability of domestic European economies. As observed previously, the results consistently reveal that geopolitical tensions adversely affect the

sustainability of external accounts. However, a parallel effect is not evident now in public accounts when all control variables are considered (refer to columns (7) and (14)). The proximity between countries emerges as a significant factor influencing external sustainability, particularly when accounting for geopolitical tensions. This underscores the presence of spillover effects among neighbouring nations. Such interconnections are notably pronounced in economically integrated regions like the European Union, as reflected in our study.

On the other hand, we also analyse the impact of the home and border geopolitical risk's differences on sustainability, as can be seen in Table 4. From this table, we observe two different effects, namely, the detrimental impact that the higher is the difference between home and border country geopolitical risk difference the lower is the fiscal sustainability levels, while the opposite rationale is observed when analysing the increasing difference between the *GPR*s (home vs. border country) on external accounts sustainability. In our opinion, the higher turmoil levels in home countries against the border countries will pressure up fiscal authorities to spend more to fight back the social instability or, alternatively, governments will not have the sufficient capacity to raise tax revenues to ensure higher public finances solvency levels. Independently the lower capacity to raise revenues or the higher is the demand for public expenditures, or the mix of both factors, instability in home country will lead to a deterioration in public finances.

Nonetheless, the increasing of such *GPR* differences seems to be positive for higher levels of external sustainability. Our explanation relates to the fact that higher instability in border countries will jeopardize the home country intentions to import since the capacity of border country is being reduced and, for this reason, external sustainability of the home country is benefited from these differences in geopolitical risks. Additionally, we may wonder that higher domestic.

Table 2. The impact of geopolitical risk of home country on fiscal and external sustainability.

	β_{Fis}							β_{Ext}						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
GPR_{Home}	-0.005***	-0.004***	-0.005***	-0.006***	-0.006***	-0.004***	-0.004***	-0.016***	-0.014***	-0.025***	-0.020***	-0.026***	-0.015***	-0.024***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
REER		0.076***					0.050***		0.219***					0.026
		(0.014)					(0.015)		(0.042)					(0.030)
Inflation			0.034***				-0.061***			0.371***				-0.093***
			(0.013)				(0.014)			(0.025)				(0.022)
Short-Rate				-0.002***			-0.002***				-0.010***			-0.004***
				(0.000)			(0.000)				(0.001)			(0.001)
Openness					0.001***		0.001***					0.005***		0.005***
					(0.000)		(0.000)					(0.000)		(0.000)
Output Gap						-0.005***	-0.005***						-0.006***	-0.004***
						(0.001)	(0.001)						(0.002)	(0.001)
Constant	0.032***	-0.302***	-0.102*	0.054***	-0.067***	0.047***	-0.030	0.716***	-0.267	-0.888***	0.769***	-0.030	0.737***	0.253
	(0.006)	(0.067)	(0.056)	(0.004)	(0.010)	(0.004)	(0.077)	(0.016)	(0.187)	(0.107)	(0.016)	(0.026)	(0.017)	(0.167)
Obs.	3,982	3,235	3,235	3,235	3,235	3,235	3,235	3,982	3,235	3,235	3,235	3,235	3,235	3,235
R^2	0.951	0.955	0.954	0.955	0.956	0.955	0.957	0.707	0.702	0.716	0.707	0.793	0.700	0.795

Notes: *, **, and *** represents the 10%, 5% and 1% levels of significance, respectively. In brackets we report the robust standard errors.

Table 3. The impact of geopolitical risk of border country on fiscal and external sustainability.

	β_{Fis}							β_{Ext}						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
GPR_{Border}	-0.003**	-0.003**	-0.002	-0.003*	-0.003**	-0.002	-0.001	-0.001	-0.005*	-0.010***	-0.005	-0.004	-0.002	-0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
REER		0.042***					0.108***		0.184***					-0.014
		(0.010)					(0.011)		(0.023)					(0.027)
Inflation			-0.091***				-0.195***			0.518***				0.387***
			(0.014)				(0.020)			(0.041)				(0.051)
Short-Rate				0.001**			-0.002***				-0.010***			-0.004***
				(0.000)			(0.001)				(0.001)			(0.002)
Openness					-0.000		-0.000					0.001***		0.001***
					(0.000)		(0.000)					(0.000)		(0.000)
Output Gap						-0.004***	-0.004***						-0.003**	-0.003**
						(0.001)	(0.001)						(0.001)	(0.001)
Constant	-0.002	-0.180***	0.402***	0.005	0.009	0.009*	0.365***	0.951***	0.123	-1.280***	1.004***	0.866***	0.962***	-0.709***
	(0.007)	(0.044)	(0.060)	(0.006)	(0.006)	(0.005)	(0.076)	(0.015)	(0.105)	(0.179)	(0.016)	(0.016)	(0.016)	(0.174)
Obs.	3,070	2,655	2,655	2,655	2,655	2,655	2,655	3,070	2,655	2,655	2,655	2,655	2,655	2,655
R^2	0.969	0.971	0.971	0.971	0.971	0.972	0.973	0.804	0.812	0.829	0.816	0.819	0.808	0.837

Notes: *, **, and *** represents the 10%, 5% and 1% levels of significance, respectively. In brackets we report the robust standard errors.

Table 4. The impact of geopolitical risk of home and border countries' differences on fiscal and external sustainability.

	β_{Fis}							β_{Ext}						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
GPR_{Diffs}	-0.001	-0.002*	-0.003**	-0.002	-0.002	-0.002*	-0.003**	0.007**	0.007*	0.008**	0.007*	0.009***	0.006*	0.010***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.004)	(0.003)
REER		-0.062**					0.009		0.218***					0.034
		(0.029)					(0.035)		(0.078)					(0.059)
Inflation			-0.183***				-0.212***			0.541***				0.167
			(0.037)				(0.048)			(0.105)				(0.109)
Short-Rate				-0.004**			-0.003				-0.026***			-0.018***
				(0.002)			(0.002)				(0.008)			(0.004)
Openness					0.000		0.000**					0.005***		0.004***
					(0.000)		(0.000)					(0.000)		(0.000)
Output Gap						-0.003***	-0.003***						-0.005*	-0.004*
						(0.001)	(0.001)						(0.003)	(0.002)
Constant	0.041***	0.345**	0.860***	0.074***	0.044***	0.059***	0.917***	0.752***	-0.218	-1.583***	0.877***	0.089*	0.782***	-0.679
	(0.008)	(0.134)	(0.160)	(0.008)	(0.016)	(0.005)	(0.163)	(0.022)	(0.351)	(0.461)	(0.036)	(0.046)	(0.024)	(0.423)
Obs.	1,824	1,409	1,409	1,409	1,409	1,409	1,409	1,824	1,409	1,409	1,409	1,409	1,409	1,409
R^2	0.961	0.963	0.964	0.963	0.963	0.963	0.964	0.603	0.574	0.582	0.582	0.650	0.572	0.658

Notes: *, **, and *** represents the 10%, 5% and 1% levels of significance, respectively. In brackets we report the robust standard errors.

4.2. Robustness analysis

Table 5 displays the results for the impact of home (Panel A) and border (Panel B) GPR on fiscal sustainability in accordance with the business cycle. When the home country (H) and the border country (B) are both negative, it means that both economies are in the same business cycle phase, however, they can be below their potential output levels, so H and B are both smaller than 0 ($H < 0$ & $B < 0$). On the other hand, when both economies are registering a GDP level higher than their respective potential levels, they are represented as $H > 0$ & $B > 0$. We also analyse the case when home and border countries are facing different business cycles phases, that is, the economies are desynchronized. These are the cases when $H > 0$ & $B < 0$ or the case when $H < 0$ & $B > 0$. Lastly, it is important to mention that the final column presents regression results with coefficients illustrating the disparity between the home country's output gap and that of the border country.

For the home country's *GPR*, it is evident that a negative output gap in the home economy coupled with a positive output gap in the border country have a negative and highly significant effect of fiscal sustainability (column (3)). This suggests that geopolitical tensions adversely affect the sustainability of public accounts when the home economy is outperforming its counterpart. Similarly, during periods when both countries' actual outputs fall below their potential values (columns (4)), *GPR* exhibits a negative impact on fiscal sustainability. Typically, periods characterized by negative output gaps are more linked to recession periods, thus countries may be more vulnerable to global adverse events. The fifth column reports a highly significant negative value for both *GPR* and the coefficient of the output gap difference, indicating a 0.3 percent reduction in sustainability due to a discrepancy between the output gaps of neighbouring countries.

Analysing the impact of the *GPR* of the border country on the fiscal sustainability of the home nation, it is evident that when both output gaps are negative and synchronized, *GPR* negatively affects public account sustainability (column (9)). Additionally, the difference between output gaps further reduces fiscal account sustainability by the same magnitude as allured for the previous case (0.3).

Table 6 replicates the same analysis as Table 5 but focuses on external sustainability. The results suggest that, irrespective of the business cycle and its synchronization, *GPR* in both the home and border country influences negatively the external accounts of the analyzed country. Furthermore, the difference between output gaps negatively affects external account performance.

Table 5. The influence of business cycles on geopolitical risks impacts over fiscal sustainability

	Business cycle (de)synchronization				
Panel A	***H & B > 0***	***H > 0 & B < 0***	***H < 0 & B > 0***	***H & B < 0***	***Diffs***
	(1)	(2)	(3)	(4)	(5)
GPR_{Home}	-0.000	0.004	-0.008***	-0.014***	-0.006***
	(0.001)	(0.005)	(0.002)	(0.003)	(0.001)
REER	0.035*	-0.357*	-0.021	0.007	0.050**
	(0.020)	(0.182)	(0.037)	(0.032)	(0.020)
Inflation	-0.107***	0.113	0.009	-0.072***	-0.095***
	(0.026)	(0.076)	(0.045)	(0.027)	(0.017)
Short-Rate	-0.004***	-0.026***	0.001	0.001	-0.002***
	(0.001)	(0.007)	(0.001)	(0.001)	(0.001)
Openness	0.001***	0.002***	0.000***	0.001***	0.001***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Output Gap Diffs					-0.003***
					(0.001)
Constant	0.214	0.995	0.042	0.116	0.082
	(0.174)	(0.736)	(0.153)	(0.141)	(0.102)
Obs.	1,284	187	896	868	1,908
R^2	0.967	0.970	0.977	0.907	0.902
	Business cycle (de)synchronization				
Panel B	***H & B > 0***	***H > 0 & B < 0***	***H < 0 & B > 0***	***H & B < 0***	***Diffs***
	(6)	(7)	(8)	(9)	(10)
GPR_{Border}	0.000	0.006	0.003	-0.006***	-0.002*
	(0.002)	(0.007)	(0.003)	(0.002)	(0.001)
REER	0.184***	0.591***	0.040	0.075***	0.114***
	(0.022)	(0.094)	(0.028)	(0.020)	(0.012)
Inflation	-0.254***	-0.360***	-0.213***	-0.142***	-0.191***
	(0.033)	(0.099)	(0.053)	(0.046)	(0.022)
Short-Rate	-0.000	-0.004*	-0.005***	-0.000	-0.002***
	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)
Openness	0.000***	-0.000***	-0.000*	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Output Gap Diffs					-0.003***
					(0.001)
Constant	0.230	-1.047**	0.802***	0.282*	0.316***
	(0.156)	(0.414)	(0.198)	(0.158)	(0.088)
Obs.	1,003	177	569	906	1,991
R^2	0.977	0.986	0.987	0.968	0.966

Notes: *, **, and *** represents the 10%, 5% and 1% levels of significance, respectively. In brackets we report the robust standard errors. *H* and *B* stands for the home and border country, accordingly.

Table 6. The influence of business cycles on geopolitical risks impacts over external sustainability

	Business cycle (de)synchronization effects				
Panel A	***H & B > 0***	***H > 0 & B < 0***	***H < 0 & B > 0***	***H & B < 0***	***Diffs***
	(1)	(2)	(3)	(4)	(5)
GPR_{Home}	-0.023***	-0.041***	-0.016***	-0.036***	-0.027***
	(0.003)	(0.014)	(0.004)	(0.005)	(0.003)
REER	-0.163***	-0.339	0.201***	0.320***	0.020
	(0.038)	(0.218)	(0.064)	(0.056)	(0.040)
Inflation	-0.117***	-0.402***	-0.094	-0.284***	-0.145***
	(0.033)	(0.100)	(0.060)	(0.054)	(0.029)
Short-Rate	-0.000	0.029***	-0.014***	-0.013***	-0.002***
	(0.001)	(0.009)	(0.002)	(0.002)	(0.001)
Openness	0.006***	0.009***	0.005***	0.006***	0.006***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
Output Gap Diffs					-0.002**
					(0.001)
Constant	1.105***	2.498***	-0.456	-0.280	0.461**
	(0.247)	(0.891)	(0.337)	(0.328)	(0.229)
Obs.	1,284	187	896	868	1,908
R^2	0.825	0.953	0.820	0.802	0.799
	Business cycle (de)synchronization effects				
Panel B	***H & B > 0***	***H > 0 & B < 0***	***H < 0 & B > 0***	***H & B < 0***	***Diffs***
	(6)	(7)	(8)	(9)	(10)
GPR_{Border}	-0.021***	0.022*	-0.000	-0.014***	-0.010***
	(0.005)	(0.012)	(0.007)	(0.005)	(0.003)
REER	-0.274***	0.229	0.061	0.067**	0.002
	(0.054)	(0.212)	(0.046)	(0.027)	(0.028)
Inflation	0.486***	-0.156	0.632***	0.497***	0.398***
	(0.087)	(0.203)	(0.093)	(0.080)	(0.057)
Short-Rate	-0.007***	-0.010**	-0.033***	-0.001	-0.003
	(0.002)	(0.004)	(0.004)	(0.002)	(0.002)
Openness	0.001***	0.000	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Output Gap Diffs					-0.003***
					(0.001)
Constant	0.042	0.715	-2.027***	-1.616***	-0.863***
	(0.344)	(0.852)	(0.373)	(0.295)	(0.195)
Obs.	1,003	177	569	906	1,991
R^2	0.852	0.940	0.928	0.819	0.815

Notes: *, **, and *** represents the 10%, 5% and 1% levels of significance, respectively. In brackets we report the robust standard errors. *H* and *B* stands for the home and border country, accordingly.

Beyond the analyses on business cycles synchronization, we made an additional robustness analysis related with the debt ratio differences, and we report these results in Table 7. We still obtain the same detrimental impact from higher geopolitical risks on home fiscal and external sustainability, independently of considering the geopolitical risk of home or border country. The only exception is when the home country government debt ratio is lower than the border country government debt ratio, which, in this case, translates into a negative difference (H - B < 0), i.e., columns (2), (5), (8) and (11) in Table 7. In this case, while this negative difference makes geopolitical risk to have a non-significance on fiscal sustainability (columns (2) and (8)), the same negative difference

between home and border country government debt lead GPR to have a harmful influence on external sustainability coefficients (columns (5) and (11)).

Additionally, in Table 8 we intended to analyse how geopolitical risk in the border country influenced the difference between home and border countries' time-varying fiscal and external sustainability coefficients. From this exercise, we conclude that the higher is geopolitical risk in the border country the higher is the difference between external sustainability between home and border country. This is in line with the baseline estimations when border countries' geopolitical risk positively affects the home country external sustainability coefficient. This rationale can be extended to the difference between home and border fiscal sustainability coefficients. However, and in line with the results in Tables 2 and 3, the influence of geopolitical risk is stronger, in absolute terms, on external accounts.

Lastly, we carried out a complementary exercise to the geopolitical risk analysis. We have re-estimated the baseline regressions (5) and (6) but replacing the geopolitical risk by the world uncertainty indexes (*WUI*) of both home and border countries, and we report these results in Table 9. This additional exercise allowed us to extract interesting complementary insights of different risk types on fiscal and external sustainability. For instance, while home country uncertainty indexes contribute for jeopardizing fiscal sustainability (columns (1) to (7)), higher levels of uncertainty in border countries seem to stimulate country fiscal sustainability (columns (15) to (21)). As *WUI* and *GPR* do not proxy the same source of risk, this additional exercise allows public authorities to assess these different risks to manage their own fiscal policies in different ways. On the other hand, higher *WUI* values appear to positively impact on external sustainability when these uncertainty indexes emerge within the home country and a non-significant impact on external accounts when the uncertainty arises from the exterior. Following the same argument used for fiscal sustainability analysis, these results allow public authorities to consider different types of risks, geopolitical or uncertainty indexes, originated from their own countries or neighbour countries to efficiently manage a sustainable path for both fiscal and external sectors.

Table 7. The impact of geopolitical risk effects on fiscal and external sustainability considering government debt differences between home and border countries.

	β_{Fis}			β_{Ext}		
Panel A	***H - B > 0***	***H - B < 0***	***Diffs***	***H - B > 0***	***H - B < 0***	***Diffs***
	(1)	(2)	(3)	(4)	(5)	(6)
GPR_{Home}	-0.006***	0.001	-0.003**	-0.024***	-0.009**	-0.025***
	(0.001)	(0.002)	(0.001)	(0.002)	(0.004)	(0.002)
REER	0.062***	0.052*	0.035**	-0.088**	0.284***	0.006
	(0.017)	(0.027)	(0.016)	(0.035)	(0.063)	(0.036)
Inflation	-0.058***	-0.081***	-0.060***	-0.147***	0.053	-0.077***
	(0.017)	(0.031)	(0.016)	(0.026)	(0.047)	(0.025)
Short-Rate	-0.002***	-0.002	-0.002***	-0.003***	-0.008***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Openness	0.001***	0.001***	0.001***	0.006***	0.004***	0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Debt Diffs			0.000***			0.000
			(0.000)			(0.000)
Constant	-0.087	0.006	0.035	0.996***	-1.412***	0.280
	(0.092)	(0.163)	(0.088)	(0.194)	(0.353)	(0.202)
Obs.	2,331	904	2,323	2,331	904	2,323
R^2	0.952	0.973	0.951	0.810	0.859	0.804
	β_{Fis}			β_{Ext}		
Panel B	***H - B > 0***	***H - B < 0***	***Diffs***	***H - B > 0***	***H - B < 0***	***Diffs***
	(7)	(8)	(9)	(10)	(11)	(12)
GPR_{Border}	-0.007***	0.002	-0.004***	-0.013***	-0.010***	-0.015***
	(0.002)	(0.002)	(0.001)	(0.004)	(0.003)	(0.003)
REER	0.371***	0.094***	0.107***	0.256***	-0.060**	-0.010
	(0.037)	(0.012)	(0.011)	(0.078)	(0.027)	(0.026)
Inflation	-0.775***	-0.136***	-0.188***	-1.294***	0.475***	0.397***
	(0.063)	(0.023)	(0.020)	(0.132)	(0.050)	(0.049)
Short-Rate	-0.018***	-0.001	-0.002***	0.018*	-0.002	-0.004***
	(0.004)	(0.001)	(0.001)	(0.010)	(0.002)	(0.002)
Openness	-0.000*	-0.000	-0.000	0.003***	0.000***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Debt Diffs			0.000***			0.001***
			(0.000)			(0.000)
Constant	1.771***	0.183**	0.336***	5.072***	-0.805***	-0.786***
	(0.175)	(0.091)	(0.076)	(0.413)	(0.201)	(0.173)
Obs.	919	1,736	2,655	919	1,736	2,655
R^2	0.973	0.977	0.973	0.869	0.902	0.843

Notes: *, **, and *** represents the 10%, 5% and 1% levels of significance, respectively. In brackets we report the robust standard errors. *H* and *B* stands for the home and border country, accordingly.

Table 8. The impact of border country's geopolitical risk effects on the differences of home and border countries' fiscal and external sustainability.

Panel A	β_{Fis}						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GPR_{Border}	0.002	0.003	0.005***	0.004*	0.003*	0.004**	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
REER		0.039***					0.120***
		(0.014)					(0.015)
Inflation			-0.122***				-0.242***
			(0.019)				(0.028)
Short-Rate				0.001**			-0.002***
				(0.001)			(0.001)
Openness					0.000		0.000
					(0.000)		(0.000)
Output Gap						-0.004***	-0.005***
						(0.001)	(0.001)
Constant	-0.114***	-0.274***	0.428***	-0.103***	-0.098***	-0.098***	0.411***
	(0.010)	(0.064)	(0.081)	(0.009)	(0.010)	(0.009)	(0.110)
Obs.	3,070	2,655	2,655	2,655	2,655	2,655	2,655
R^2	0.947	0.941	0.942	0.941	0.941	0.942	0.945
Panel B	β_{Ext}						
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
GPR_{Border}	0.012***	0.016***	0.011***	0.012***	0.012***	0.015***	0.012***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
REER		-0.118***					-0.308***
		(0.029)					(0.030)
Inflation			0.255***				0.297***
			(0.037)				(0.049)
Short-Rate				-0.008***			-0.005***
				(0.001)			(0.001)
Openness					0.001***		0.001***
					(0.000)		(0.000)
Output Gap						-0.004***	-0.003**
						(0.001)	(0.001)
Constant	0.154***	0.709***	-0.931***	0.205***	0.081***	0.171***	0.201
	(0.020)	(0.133)	(0.157)	(0.020)	(0.021)	(0.020)	(0.203)
Obs.	3,070	2,655	2,655	2,655	2,655	2,655	2,655
R^2	0.816	0.829	0.831	0.832	0.835	0.829	0.847

Notes: *, **, and *** represents the 10%, 5% and 1% levels of significance, respectively. In brackets we report the robust standard errors.

Table 9. The impact of world uncertainty index of home and border countries on fiscal and external sustainability.

	β_{Fis}							β_{Ext}						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
WUI_{Home}	-0.004***	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***	-0.005***	0.006***	0.007***	0.006***	0.006***	0.003**	0.008***	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	(0.001)
REER		0.064***					0.095***		0.195***					-0.049***
		(0.010)					(0.011)		(0.020)					(0.018)
Inflation			-0.015				-0.051***			0.407***				0.249***
			(0.014)				(0.016)			(0.023)				(0.022)
Short-Rate				0.000			-0.000				-0.009***			-0.004***
				(0.000)			(0.000)				(0.001)			(0.001)
Openness					-0.000*		-0.000**					0.004***		0.004***
					(0.000)		(0.000)					(0.000)		(0.000)
Output Gap						-0.003***	-0.003***						-0.005***	-0.004***
						(0.000)	(0.000)						(0.001)	(0.001)
Constant	-0.009	-0.293***	0.063	-0.002	0.015	-0.002	-0.189**	0.923***	0.046	-0.815***	0.971***	0.584***	0.930***	-0.215**
	(0.005)	(0.046)	(0.058)	(0.005)	(0.011)	(0.005)	(0.086)	(0.013)	(0.091)	(0.097)	(0.014)	(0.014)	(0.014)	(0.101)
Obs.	6,001	5,353	5,353	5,353	5,353	5,353	5,353	6,001	5,353	5,353	5,353	5,353	5,353	5,353
R^2	0.932	0.935	0.934	0.934	0.934	0.935	0.936	0.869	0.875	0.885	0.877	0.905	0.872	0.913
	β_{Fis}							β_{Ext}						
	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
WUI_{Border}	0.002**	0.002***	0.002***	0.002***	0.002***	0.002**	0.002***	0.002	0.003	0.001	0.001	0.003*	0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
REER		0.025***					0.052***		0.152***					0.019
		(0.009)					(0.009)		(0.020)					(0.018)
Inflation			-0.074***				-0.113***			0.405***				0.304***
			(0.013)				(0.016)			(0.023)				(0.026)
Short-Rate				0.000			-0.001***				-0.008***			-0.004***
				(0.000)			(0.000)				(0.001)			(0.001)
Openness					0.000***		0.000***					0.001***		0.001***
					(0.000)		(0.000)					(0.000)		(0.000)
Output Gap						-0.005***	-0.005***						-0.005***	-0.004***
						(0.001)	(0.001)						(0.001)	(0.001)
Constant	0.004	-0.101**	0.329***	0.011*	0.002	0.011*	0.251***	0.935***	0.255***	-0.794***	0.981***	0.832***	0.941***	-0.521***
	(0.006)	(0.040)	(0.055)	(0.006)	(0.007)	(0.006)	(0.068)	(0.014)	(0.087)	(0.097)	(0.014)	(0.015)	(0.015)	(0.110)
Obs.	4,436	3,944	3,944	3,944	3,944	3,944	3,944	4,436	3,944	3,944	3,944	3,944	3,944	3,944
R^2	0.950	0.952	0.953	0.952	0.952	0.954	0.955	0.840	0.846	0.861	0.850	0.853	0.844	0.869

Notes: *, **, and *** represents the 10%, 5% and 1% levels of significance, respectively. In brackets we report the robust standard errors.

5. Conclusions and policy implications

In our study we employ Schlicht's (2021) methodology to estimate fiscal and external sustainability coefficients for 27 European Union countries from 2001Q4 to 2022Q3. Specifically, we derive fiscal sustainability coefficients by examining the relationship between government revenues and expenditures, while we estimate external sustainability coefficients by analysing how exports respond to changes in imports.

Our findings lead us to the conclusion that geopolitical risks are consistently associated with diminished fiscal and external sustainability, with a more pronounced impact when considering home geopolitical risks. Furthermore, the influence of geopolitical tensions is notably more prominent on external accounts' sustainability compared to fiscal sustainability. The adverse effects of geopolitical risk on external sustainability can be approximately three to six times higher than those observed in the realm of public finances. Moreover, in the context of the home country's geopolitical risk, a negative output gap in the home economy, coupled with a positive output gap in the border country, exerts a negative and highly significant effect of fiscal sustainability. Thus, under recessionary periods when countries are more susceptible to global adverse events, geopolitical risk demonstrates a stronger negative impact on both fiscal and external sustainability.

Moreover, our investigation also reveals that the geopolitical risk in the border country plays a pivotal role in influencing both sustainability of domestic external accounts and the difference between home and border countries' time-varying fiscal and external sustainability coefficients. Hence, the higher is the geopolitical risk in the border country the higher are domestic external imbalances and the difference between external sustainability between home and border country. We may conjecture that this discrepancy between home and border nations may have the following consequences: increased instability in home countries, relative to border nations, may prompt higher government spending or tax revenue challenges, leading to deteriorating public finances. However, greater differences in geopolitical risk positively impact external sustainability, as heightened instability in border countries limits the home country's import intentions, benefiting its external sustainability.

Lastly, we conclude that the close proximity of countries plays a crucial role. This could be evidence of the existence of spillover effects among neighbouring nations, a phenomenon particularly evident in economically integrated regions such as the European Union, as reflected in our study.

In light of our analysis, it is important for countries to adopt a nuanced and comprehensive approach to policymaking that acknowledges the complex interplay of geopolitical tensions,

world uncertainty and economic interdependence. From an institutional standpoint, we underscore the necessity for nations to factor in the geopolitical challenges they and their neighbouring countries confront when shaping their policy decisions. In instances of heightened instability, whether driven by internal and external developments, territorial disputes, or governmental instabilities, the efficacy of economic adjustments may be challenging.

Moreover, the increasing integration of economies introduces a risk of spillover effects within unions, as events in one country may rapidly spread to contiguous nations, potentially leading to adverse consequences for domestic economies. This underscores the critical need for a thorough assessment of both internal and external risks. Thus, policymakers must be attuned to the potential repercussions of economic interdependence, recognizing that disturbances within the union may reverberate across borders, impacting home nations adversely.

Furthermore, a key takeaway of our study is the recognition that less fiscally sustainable accounts and external imbalances could exacerbate the challenges that geopolitical tension gives, potentially resulting in uncontrolled deficits. In light of this it seems rather advisable for policymakers to vigilantly monitor their public and current account deficits, paving the way for proactive and gradual policy interventions. Effective responses to these challenges may involve the implementation of robust structural policy reforms, more stringent fiscal consolidation episodes, and measures aimed at enhancing external competitiveness. By adopting such a proactive stance, countries can potentially mitigate the geopolitical risks, fostering greater stability and resilience in the face of evolving global dynamics.

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Appendix

Table A1. Home and Border countries

Country	Border 1	Border 2	Border 3	Border 4	Border 5	Border 6	Border 7	Border 8
Austria	Czechia	Germany	Hungary	Italy	Slovakia	Slovenia		
Belgium	France	Germany	Luxembourg	Netherlands				
Bulgaria	Greece	Romania						
Croatia	Hungary	Slovenia						
Cyprus								
Czechia	Austria	Germany	Poland	Slovakia				
Denmark	Germany							
Estonia	Latvia							
Finland	Sweden							
France	Belgium	Germany	Italy	Luxembourg	Spain			
Germany	Austria	Belgium	Czechia	Denmark	France	Luxembourg	Netherlands	Poland
Greece	Bulgaria							
Hungary	Austria	Bulgaria	Slovakia	Slovenia				
Ireland								
Italy	Austria	France	Slovenia					
Latvia	Lithuania	Estonia						
Lithuania	Latvia	Poland						
Luxembourg	Belgium	France	Germany					
Malta								
Netherlands	Belgium	Germany						
Poland	Czechia	Germany	Lithuania	Slovakia				
Portugal	Spain							
Romania	Bulgaria	Hungary						
Slovakia	Austria	Czechia	Hungary	Poland				
Slovenia	Austria	Hungary	Italy					
Spain	France	Portugal						
Sweden	Finland							

Table A2. Correlation matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) β_{Fis}	1.000									
(2) β_{Ext}	0.417	1.000								
(3) *GPR*	-0.340	-0.220	1.000							
(4) *WUI*	-0.001	0.000	-0.030	1.000						
(5) *REER*	-0.092	0.043	-0.011	-0.119	1.000					
(6) *HICP*	0.047	0.261	0.223	0.117	-0.212	1.000				
(7) *Short-rate*	0.156	-0.065	-0.385	-0.068	0.196	-0.625	1.000			
(8) *Openness*	0.224	0.386	-0.343	-0.062	-0.041	0.183	0.146	1.000		
(9) *Outputgap*	-0.002	-0.016	0.018	0.022	-0.006	0.036	0.145	0.056	1.000	
(10) *Debt*	-0.240	-0.037	0.296	0.080	0.008	0.262	-0.390	-0.100	-0.108	1.000

Figure A1. Debt-to-GDP ratio dynamics for selected countries.

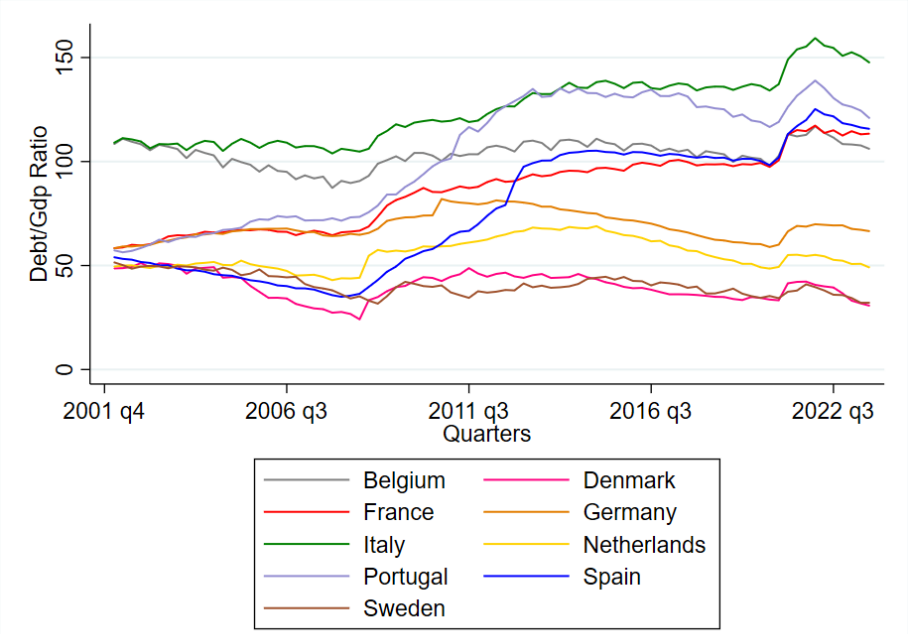

Figure A2. Relationship between the relative time-varying fiscal and external sustainability coefficients against their respective average values.

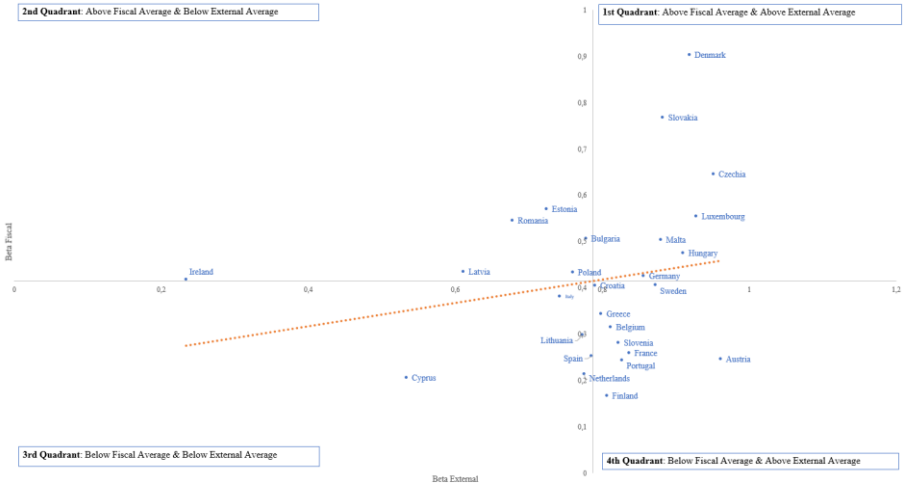

Table A3. Augmented Dickey-Fuller unit root tests for revenues, expenditures, exports and imports series, in levels and in first-differences.

	Levels								*F.D.*							
	Revenues	**Obs.**	**Expenditures**	**Obs.**	**Exports**	**Obs.**	**Imports**	**Obs.**	**Revenues**	**Obs.**	**Expenditures**	**Obs.**	**Exports**	**Obs.**	**Imports**	**Obs.**
Austria	-2.58*	82	-3.509***	82	-2.634*	82	-2.5	82	-5.57***	81	-4.021***	81	-4.088***	81	-4.356***	81
Belgium	-1.394	82	-2.245	82	-2.45	82	-2.379	82	-4.809***	81	-4.482***	81	-4.68***	81	-5.064***	81
Bulgaria	-2.468	82	-2.49	82	-1.68	82	-3.639***	82	-5.282***	81	-5.121***	81	-3.525***	81	-3.282**	81
Croatia	-2.227	81	-3.6***	81	1.424	81	0.448	81	-3.846***	80	-3.897***	80	-1.338	80	-1.516	80
Cyprus	-1.468	82	-3.325**	82	1.145	82	1.681	82	-5.338***	81	-5.442***	81	-3.416**	81	-4.083***	81
Czechia	-3.414**	82	-1.968	82	-2.17	82	-2.435	82	-6.504***	81	-4.814***	81	-3.745***	81	-3.75***	81
Denmark	-1.589	82	-1.857	82	-0.441	82	-1.546	82	-3.061**	81	-2.896**	81	-2.724*	81	-3.52***	81
Estonia	-2.867**	82	-3.095**	82	-1.511	82	-2.336	82	-4.843***	81	-3.39**	81	-3.195**	81	-3.936***	81
Finland	-1.21	82	-2.016	82	-3.492***	82	-3.029**	82	-5.629***	81	-3.388**	81	-3.713***	81	-3.289**	81
France	-0.861	81	-2.225	81	-1.833	81	-0.734	81	-3.345**	80	-3.72***	80	-3.769***	80	-3.543***	80
Germany	-1.774	81	-2.618*	81	-1.682	81	-0.74	81	-4.547***	80	-2.800*	80	-4.506***	80	-3.387	80
Greece	-0.429	82	-2.51	82	0.529	82	0.501	82	-4.805***	81	-4.994***	81	-2.408	81	-2.351	81
Hungary	-1.382	82	-3.171**	82	-1.631	82	-1.562	82	-4.731***	81	-5.451***	81	-3.178**	81	-3.064**	81
Ireland	-0.336	82	-0.656	82	0.177	82	-1.704	82	-4.606***	81	-5.25***	81	-3.047**	81	-4.758***	81
Italy	-0.745	81	-1.983	81	-0.601	81	-0.625	81	-4.082***	80	-4.189***	80	-3.592***	80	-3.041**	80
Latvia	-1.867	81	-2.448	81	-0.782	81	-2.136	81	-4.19***	80	-3.098**	80	-2.338	80	-2.484	80
Lithuania	-1.392	82	-2.243	82	-1.087	82	-2.194	82	-3.913***	81	-4.131***	81	-3.898***	81	-3.565***	81
Luxembourg	-2.604*	82	-3.512***	82	-1.145	82	-1.007	82	-4.962***	81	-3.993***	81	-3.481***	81	-4.219***	81
Malta	-2.27	82	-2.249	82	-1.253	82	-1.819	82	-5.5***	81	-4.749***	81	-2.761*	81	-3.582***	81
Netherlands	-1.496	82	-2.715*	82	-1.178	82	-0.733	82	-5.974***	81	-3.584***	81	-3.461***	81	-3.665***	81
Poland	-1.897	82	-2.787*	82	-0.937	82	-1.196	82	-4.362***	81	-5.248***	81	-3.839***	81	-3.526***	81
Portugal	-1.064	82	-1.931	82	-0.329	82	-1.009	82	-6.689***	81	-4.489***	81	-2.277	81	-2.946**	81
Romania	-2.847**	82	-2.036	82	-1.177	82	-1.811	82	-4.424***	81	-5.829***	81	-3.606***	81	-3.736***	81
Slovakia	-1.541	82	-2.984**	82	-2.234	82	-1.886	82	-4.901***	81	-3.547***	81	-3.271**	81	-3.545***	81
Slovenia	-1.035	82	-2.156	82	-1.045	82	-2.002	82	-5.074***	81	-5.222***	81	-2.974**	81	-3.694***	81
Spain	-1.759	81	-1.955	81	-0.48	81	-1.808	81	-3.008**	80	-3.242**	80	-3.095**	80	-3.854***	80
Sweden	-1.237	82	-2.083	82	-3.293**	82	-3.198**	82	-4.700***	81	-3.796***	81	-3.748***	81	-3.866***	81

Notes: *, **, and *** represents the 10%, 5% and 1% levels of significance, respectively.

Table A4. Augmented Dickey-Fuller unit root tests for revenues, expenditures, exports and imports series, in levels and in first-differences.

	Levels								*F.D.*							
	Revenues	**Obs.**	**Expenditures**	**Obs.**	**Exports**	**Obs.**	**Imports**	**Obs.**	**Revenues**	**Obs.**	**Expenditures**	**Obs.**	**Exports**	**Obs.**	**Imports**	**Obs.**
Austria	-2.519	83	-2.417	83	-1.183	83	-0.360	83	-7.439***	82	-5.368***	82	-3.383**	82	-3.256**	82
Belgium	-1.238	83	-1.846	83	-0.199	83	-0.124	83	-7.193***	82	-6.005***	82	-3.279**	82	-3.164**	82
Bulgaria	-2.393	83	-2.076	83	-1.061	83	-1.78	83	-6.877***	82	-7.204***	82	-3.757***	82	-3.121**	82
Croatia	-1.871	83	-2.032	83	1.302	83	2.098	83	-6.614***	82	-3.992***	82	-1.751	82	-1.269	82
Cyprus	-1.351	83	-3.039**	83	1.632	83	2.149	83	-8.821***	82	-7.984***	82	-5.362***	82	-6.646***	82
Czechia	-3.264**	83	-1.800	83	-1.731	83	-1.337	83	-8.303***	82	-8.087***	82	-3.529***	82	-3.453***	82
Denmark	-0.17	83	-0.508	83	0.803	83	-0.318	83	-4.226***	82	-3.594***	82	-2.189	82	-2.966**	82
Estonia	-2.468	83	-1.662	83	-0.822	83	-1.393	83	-6.24***	82	-4.115***	82	-3.884***	82	-4.419***	82
Finland	-1.303	83	-1.561	83	-1.558	83	-1.003	83	-9.796***	82	-3.743***	82	-3.637***	82	-2.857*	82
France	-0.256	83	-1.701	83	-0.613	83	0.214	83	-6.244***	82	-5.022***	82	-2.847*	82	-1.872	82
Germany	-2.578*	83	-1.225	83	-1.609	83	-0.100	83	-6.241***	82	-4.829***	82	-3.416**	82	-2.552	82
Greece	-0.314	83	-1.939	83	1.371	83	3.152	83	-7.031***	82	-5.875***	82	-2.461	82	-2.787*	82
Hungary	-1.176	83	-2.765*	83	-0.958	83	-0.385	83	-7.139***	82	-7.143***	82	-3.55***	82	-2.945**	82
Ireland	0.172	83	-0.624	83	0.925	83	-1.419	83	-5.407***	82	-8.178***	82	-4.136***	82	-6.548***	82
Italy	-0.395	83	-1.014	83	0.868	83	1.16	83	-6.996***	82	-4.703***	82	-3.028**	82	-1.661	82
Latvia	-1.600	83	-1.541	83	-0.051	83	-0.601	83	-9.227***	82	-6.376***	82	-2.473	82	-2.423	82
Lithuania	-1.142	83	-1.666	83	-0.699	83	-1.115	83	-7.31***	82	-5.557***	82	-3.663***	82	-3.149**	82
Luxembourg	-2.261	83	-2.723*	83	-0.121	83	-0.045	83	-6.656***	82	-4.93***	82	-3.607***	82	-4.067***	82
Malta	-2.293	83	-1.825	83	-0.952	83	-1.258	83	-7.875***	82	-6.384***	82	-3.892***	82	-4.246***	82
Netherlands	-1.382	83	-1.743	83	-0.03	83	-0.107	83	-8.05***	82	-4.397***	82	-3.113**	82	-4.722***	82
Poland	-1.688	83	-2.316	83	-0.232	83	-0.006	83	-7.315***	82	-6.751***	82	-4.485***	82	-3.815***	82
Portugal	-1.163	83	-1.797	83	0.376	83	1.109	83	-9.895***	82	-7.601***	82	-2.391	82	-2.986**	82
Romania	-2.334	83	-1.726	83	-0.901	83	-1.002	83	-6.888***	82	-7.019***	82	-4.317***	82	-4.104***	82
Slovakia	-0.983	83	-1.836	83	-1.686	83	-0.789	83	-5.523***	82	-4.158***	82	-3.788***	82	-3.584***	82
Slovenia	-0.882	83	-2.064	83	-0.419	83	-0.213	83	-7.624***	82	-8.19***	82	-2.711*	82	-2.808*	82
Spain	-0.007	83	-1.248	83	0.826	83	0.290	83	-4.419***	82	-5.803***	82	-2.487	82	-2.739*	82
Sweden	-1.252	83	-1.294	83	-1.328	83	-0.681	83	-4.962***	82	-5.424***	82	-3.538***	82	-2.69*	82

Notes: *, **, and *** represents the 10%, 5% and 1% levels of significance, respectively.