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REM Working Paper 0356-2024

November 2024

REM – Research in Economics and Mathematics

Rua Miguel Lúpi 20,
1249-078 Lisboa,
Portugal

ISSN 2184-108X

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Determinants of trade partner concentration: An analysis for European countries¹

António Afonso² José Alves³ Lucas Menescal⁴ Sofia Monteiro⁵

October 2024

Abstract

After computing the Gini and Herfindahl-Hirschman indexes for exports and imports partner concentration for a set of 31 European countries between 1995 and 2023, we analyse the role of macroeconomic, institutional and uncertainty effects on the partner concentration (diversification) of exports and imports. From our analysis, we disentangle different effects, namely that while global GDP leads to an increase in concentration in both exports and imports, internal rates of return increase exports diversification, reducing it for imports. Additionally, European uncertainty reduces the concentration of the product countries' origin/destination for imports and exports, respectively. Our results provide a comprehensive set of results that enable public authorities and firms to minimize their risks when trading with the exterior.

JEL: C33, E02, F14, F32, F41, G15

Keywords: Exports; Imports; Gini index; Herfindahl-Hirschman index; Determinants of concentration

¹ We also thank comments from participants at 12th UECE Conference on Economic and Financial Adjustments, 19 Jul 2024, Lisbon. This work was supported by the FCT (Fundação para a Ciência e a Tecnologia) [grant numbers UIDB/05069/2020 and UI/BD/152307/2021]. The opinions expressed herein are those of the authors and do not necessarily reflect those of the authors' employers. Any remaining errors are the authors' sole responsibility.

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1. Introduction

The relative concentration or diversification of a country's exports and imports among different products has been subject of recurrent theoretical debates and empirical investigation, partly due to widespread globalization and trade interconnectedness, but also as an attempt to assess the impacts of business cycles and minimize external vulnerability. In this respect, the association of trade diversification with economic growth and comparative advantage theories represents some of the main issues analyzed by the literature (see Cadot et al., 2013).

For instance, Imbs and Wacziarg (2003) and Koren and Tenreyro (2007) suggested the existence of a U-shaped relationship between production concentration and income levels, whilst Klinger and Lederman (2006) and Parteka (2007) observed that trade concentration was significantly higher than overall production concentration and that exports in higher income countries was significantly more diversified than in lower income countries.⁶ This evidence also relates to natural-resource "curse" discussions which argue that larger shares of natural-resource exports are associated to diminished economic growth, lower productivity and deteriorated terms of trade (see Sachs and Warner, 1995; Gylfason, 2008).⁷

Furthermore, Agosin et al. (2012) showed evidence that trade openness does not necessarily favor export diversification, but that financial development and capital accumulation contribute positively to the diversity of exports.⁸ Conversely, Parteka and Tamberi (2013) suggest that smaller nations distant from economic hubs exhibit higher levels of specialization and argue that diversification is more achievable with enhanced access to larger markets and further international integration via open trade policies which may also mitigate exposure to economic risks.

With respect to imports, most trade models consider welfare and productivity gains from diversification through lower input prices, higher quality and access to new technologies and varieties of goods. In this sense, rises in imports diversification may push local producers to innovate and increase productivity in an "import competition" sort of approach by incorporating complementary diffusion gains and technological

⁶ Easterly et al. (2009) also showed evidence that exports tend to be significantly more concentrated than overall production.

⁷ See Parteka (2010) for a summary of specialization measures and evidence on the link between diversification and development.

⁸ See also Osakwe and Kilolo (2018) and Giri et al. (2019).

spillovers from foreign goods (Markusen, 1989; Grossman and Helpman, 1991; Keller, 2002; Halpern et al., 2015).

The analysis of trade diversification, however, seems to focus mainly on the degree of concentration between product lines and not on the concentration across trade partners. Even though Panagariya and Bagaria (2013) and Bruckner (2023) found high levels of concentration in exports and imports both across product lines and trading partners, the fact that countries in different locations and with notably distinct patterns of trade show very similar levels of partner concentration has not yet been fully exploited empirically.⁹

Kali et al. (2007) argued that the structure of trade across partners is important for economic growth and suggested that the number of trading partners has a positive relationship with growth in richer countries, but that growth is associated with higher trade concentration in poorer countries. Babones et al. (2011, 2012) also constructed a database of trade partner concentration indices for a large set of countries and discussed its relationship with globalization. The authors show that despite the uprise of India and China in exports markets, and the shift on trade “dependency” of poorer countries from Europe and the US, the overall trade structure of the world economy has remained very similar over the last years.

In theory, the concentration of trade across trading partners may be partially explained by a combination of factors used in gravity models such as economic size, trade distance and cost variables. However, a clear explanation for the high level of trade concentration across trading partners was not yet found, even when excluding high-unit-value products or products transacted in high volumes (see Bahar and Santos, 2018; Cárcamo-Díaz and Nkurunziza, 2019). Factors related to sector-specific concentration levels could also be present, as certain activities tend to have higher specialization levels due to the nature of the goods produced (Cárcamo-Díaz and Bhalla, 2019). Moreover, geographic factors can influence trade concentration due to proximity to major markets and production centers, as international trade agreements and commercial regulations tend to promote cooperation and integration.

Supplemental factors of trade concentration may also be related to push and pull factors prevalent in international trade such as market structures, production capabilities and supply chain connections. In this sense, push factors can drive countries to seek new

⁹ The authors show that a small share of exported (imported) products account for most of the value of exports (imports) and that a small number of source (destination) countries account for the bulk of the import (export) values.

trade partners due to market saturation, high local competition and unfavorable regulatory environments. Oppositely, pull factors may attract new opportunities through higher growth potential, cost advantages and trade agreements. Consequently, trade partner concentration would represent a balance between these factors and reflect overall economic complexity, trade resilience and logistic decisions.

The role of push and pull factors to international capital flows has been extensively discussed. For instance, Wang and Yang (2022) found significant evidence of global risk aversion and regional contagion mechanisms in support of global financial cycles and investor differentiation hypothesis.¹⁰ Moreover, Afonso et al. (2024) examined how business cycles, government debt and sovereign rating scores affect equity flows in developed economies. They found evidence that equity flows are intensified in countries at the same stage of business cycles and that macroeconomic and financial variables matter mostly to larger equity flows, while institutional characteristics are more relevant to smaller flows.

Thus, the determination of trade partner concentration seems to be the result of a mix between gravity type of factors, product and sector-specific characteristics, geographic determinants and attractive/repellent elements (push and pull factors). These may be classified as macroeconomic factors, external competitiveness determinants and institutional characteristics, all of which seem to have important roles in determining the concentration of exports and imports across trade partners. Technological advancements can also encourage partner diversification and improve trade, while global events such as pandemics, geopolitical tensions and natural disasters tend to have unexpected consequences to trade partnerships and commercial integration.

Hence, we compute Gini and Herfindahl-Hirschman indexes for products exports and imports for 31 European countries between 1995 and 2023, and assess the role of macroeconomic, institutional and uncertainty effects on the partner concentration (diversification) of exports and imports. From our analysis, we find that global GDP leads to an increase in concentration in both exports and imports, and internal rates of return increase exports diversification, reducing it for imports. Additionally, higher regional

¹⁰ Ftiti et al. (2024) analyzed the push and pull drivers of capital flows between the BRICS and European nations, as well as the role of contagion factors. The authors showed that European countries tend to generate mainly outflows of capital, while BRICS countries essentially attract capital flows based on internal and global determinants. They also discuss the sensitivity of capital flows to capital constraints and highlight the different trends between Europe and BRICS associated with their respective economic and geopolitical characteristics.

uncertainty leads to increases in partner diversification, while institutional strength seems to have mixed effects on both exports and imports concentration dynamics.

2. Methodology

In order to analyze the role of different variables groups on Gini and HHI indexes for exports and imports, we resort to a panel data of 31 European economies, namely, Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia Spain, Sweden, Switzerland, and the United Kingdom, between 1995 and 2023.

Therefore, to determine the influence of each variable in the exports and import concentration indexes, we rely on the following expression:

$$Concentration_{k,i,t} = \alpha_0 + \beta_n \cdot X_{n,i,t} + \phi_i + \eta_t + \varepsilon_{i,t} \quad (1),$$

where *Concentration* are the *k* concentration indexes, namely Gini and HHI indexes for exports and imports, *X* is each of the explanatory variable we are interested to analyse, ϕ and η are the country- and time-fixed effects, respectively and ε is the error term.

In what concerns to our dependent variables, i.e., exports and imports Gini and HHI indexes, we compute such indexes by year and by country, based on IMF's Direction of Trade Statistics.

For our analysis, we employ a comprehensive set of determinants encompassing macroeconomic, political, and global risk factors. Concerning macroeconomic variables, we utilize the natural logarithm of the real global Gross Domestic Product (*GDP_{global}*) This variable is constructed by computing the natural logarithm of the sum of the nominal GDPs of global economies, deflated by each economy's GDP price deflator on an annual basis. The nominal GDP and price deflator data are sourced from the International Monetary Fund's (IMF) World Economic Outlook (WEO) database. Additionally, from the WEO, we incorporate total investment (*investment*) and gross national savings (savings), both expressed as percentages of GDP. Based on these two variables, we derive a measure of investment financing capacity (*invfinancecap*), defined as the difference between gross national savings and total investment. This measure allows us to evaluate whether an economy can finance its own investment projects and the extent to which this capacity influences the concentration of exports and imports with counterpart countries.

From the Penn World Table (version 10.01) by Feenstra et al. (2015), we include several variables: the human capital index (*hc*), based on years of schooling and returns to education; the natural logarithm of total factor productivity (*tfp*) at constant national prices (2017=100); and the real internal rate of return (*irr*), expressed as a percentage. These variables enable us to analyze how human and total capital productivity impact the concentration of exports and imports, as well as how the internal rate of return of the domestic economy affects the concentration of exports or imports with counterpart economies.

Furthermore, we examine the role of institutional factors and uncertainty in the dynamics of export and import concentration in the evaluated economies. For institutional variables, we utilize the economic complexity index computed using both the Harmonized System (*econcomplexhs*) and the Standard International Trade Classification (*econcomplexsite*) product classifications to assess how economic complexity influences trade concentration. These measures are complementary, and for robustness checks, we use both variables separately to evaluate their effects on concentration indexes. Additionally, based on the World Bank's Worldwide Governance Indicators (WGI) database, we incorporate the following variables: political stability and absence of violence/terrorism (*polstab*), which measures perceptions of political instability and politically-motivated violence, including terrorism, on a scale from -2.5 to 2.5; regulatory quality (*regqual*), which captures perceptions of the government's ability to formulate and implement sound policies and regulations that promote private sector development, also ranging from -2.5 to 2.5; rule of law (*rulelaw*), which measures perceptions of confidence in and adherence to societal rules, including the quality of contract enforcement, property rights, police, and courts, as well as the likelihood of crime and violence, on a scale from -2.5 to 2.5; and voice and accountability (*voiceaccount*), which captures perceptions of the extent to which a country's citizens can participate in selecting their government, as well as their freedom of expression, freedom of association, and a free media, measured on a scale from -2.5 to 2.5. Lastly, and to assess the impact of world uncertainty effects on exports and imports concentration levels, we use the economic policy uncertainty index for Europe (*ecopoluncerteu*), and the world uncertainty index for Europe (*wuieu*). This data is retrieved from Ahir et al. (2022).

In Table 1 and Figures 1 and 2, we present the summary statistics table, and correlation matrices for exports and imports, respectively. We can clearly see from table 1 that our computed concentration variables report the highest mean values with a moderate

standard deviation. Key trade concentration metrics include the Herfindahl-Hirschman Index (HHI) and Gini index for both exports and imports. The average export concentration, measured by HHI, is approximately 8.73, while imports have a higher mean concentration of 9.22. The Gini indices suggest a high overall trade concentration, with exports and imports averaging 90.57 and 91.47, respectively. Important macroeconomic indicators such as global GDP (*GDP_{global}*), investment, savings, and investment finance capacity (*invfinancecap*) are included. Notable institutional indicators (e.g., political stability, regulatory quality, and rule of law) suggest moderate political and economic stability across these countries, reflected in relatively high average values.

Regarding correlations, figures 2 and 3 display the correlation map for the variables analysed in this study. In both maps, warmer colours (red) represent stronger positive correlations, while lighter colours (yellow) indicate more negative correlations. A clear gradient of colour shades is visible, with some blocks displaying deeper reds and others lighter yellows in both figures. The heatmap for exports reveals strong correlations between trade concentration (measured by HHI and Gini indices) and several institutional and macroeconomic variables. Higher political stability, investment, and savings show positive correlations with export concentration, suggesting that these factors tend to align with a concentration on fewer trade partners. Conversely, measures like human capital (*hc*) and internal rate of return (*irr*) show a negative correlation with export concentration, indicating that increased human capital and domestic productivity lead to greater export diversification. The imports correlation matrix shows a similar pattern, with higher global GDP correlating positively with import concentration. Interestingly, human capital here is positively correlated with import concentration, implying that increased educational levels may lead countries to concentrate imports on fewer, perhaps high-quality or specialized sources. We conclude that for both exports and imports the group of institutional and uncertainties determinants report the highest correlation coefficients while the measures of concentration are primarily correlated with investment and political stability.

Figure 3 illustrates the Gini coefficients for export concentration across countries from 1995 to 2023. Austria has the highest levels of export concentration, with a consistent trend over time, implying a focus on limited export markets. Italy shows the lowest concentration, indicating a diversified export portfolio across more trading partners. The trend indicates that certain European countries, particularly smaller or

landlocked economies, may tend toward greater export concentration, possibly due to limited local market size or reliance on specific trade agreements.

Figure 4 shows the Import Gini Coefficients by Country, similar to exports, the Gini coefficients for imports show variability in concentration. Austria again has high import concentration, while Italy reports a more diversified import profile. This variation could imply that countries with higher production capacities and access to a broader range of goods are more likely to diversify imports, while smaller economies might concentrate imports from key trading partners to ensure consistency and lower transportation costs.

Figure 5 illustrates the Lorenz curves for exports and imports of France, Germany, and the United Kingdom, showcasing data for the years 1995, 2000, 2010, 2020, and 2023. Lorenz curves measure distribution equality: the further they deviate from the 45-degree line (which represents perfect equality), the greater the concentration.

Export Distribution (Panel A): Over time, the export distribution for these countries has become more balanced. In the earlier years, specifically 1995 and 2000, the Lorenz curves are positioned further from the 45-degree line, indicating a higher concentration of exports. By the later years (2010, 2020, and 2023), these curves have moved closer to the equality line, suggesting a more even distribution of exports across trading partners. This shift reflects a move towards export diversification, where goods are sold to a broader range of countries.

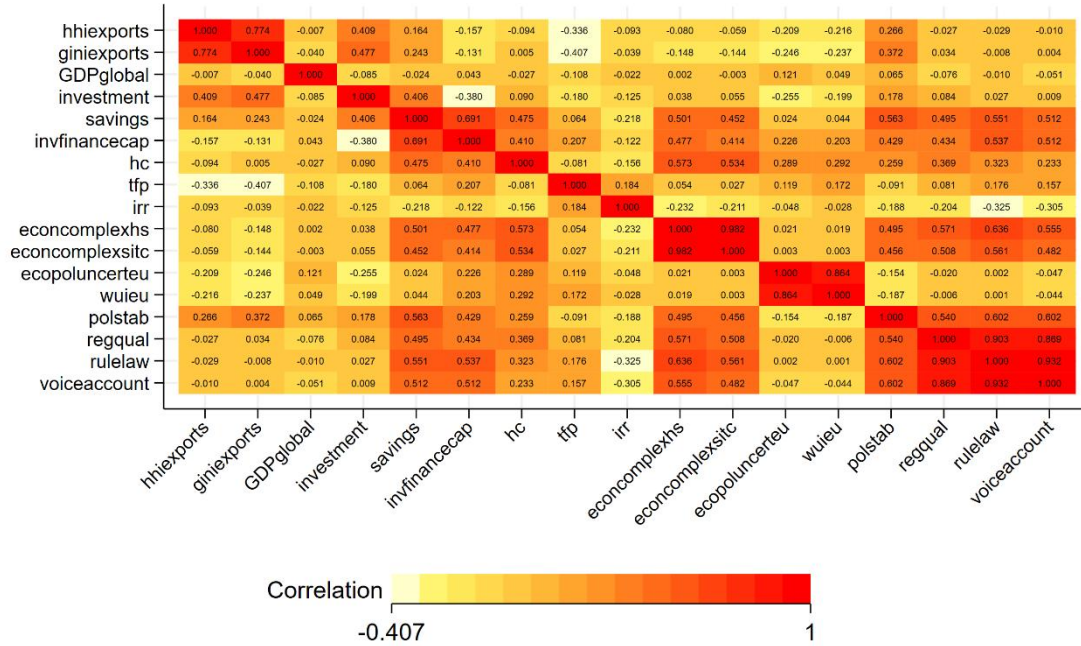
Import Distribution (Panel B): For imports, the trends vary across the countries but indicate notable fluctuations in concentration levels over time. In France, for instance, imports in 1995 were more concentrated compared to 2023, but the overall shift was moderate. Germany and the UK show more distinct fluctuations: both countries experienced greater import concentration in 1995 and 2023, while imports in 2000 and 2010 were distributed more equally. These changes suggest that import concentration may be subject to shorter-term influences, perhaps reflecting shifts in trade policies or economic conditions during certain years.

Table 1. Summary statistics for the employed variables, 1995-2023.

<i>Variable</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>	<i>Obs.</i>
<i>hhiexports</i>	8.730	2.953	3.777	19.854	895
<i>giniexports</i>	90.566	2.404	84.713	96.213	895
<i>hhiimports</i>	9.219	3.842	4.626	24.445	895
<i>giniimports</i>	91.474	2.041	85.859	97.254	895
<i>GDPglobal</i>	32.059	0.521	31.601	34.567	899
<i>investment</i>	23.090	4.480	1.157	53.713	899
<i>savings</i>	22.808	6.065	3.853	51.859	899
<i>invfinancecap</i>	-0.282	5.982	-23.857	30.169	899
<i>hc</i>	3.156	0.329	2.074	3.849	775
<i>tfp</i>	4.569	0.108	4.075	4.929	775
<i>irr</i>	8.959	4.594	1.178	36.778	775
<i>econcomplexhs</i>	1.192	0.558	0.060	2.350	756
<i>econcomplexsicc</i>	1.200	0.569	0.020	2.450	756
<i>ecopoluncerteu</i>	4.982	0.427	4.307	5.823	897
<i>wuieu</i>	9.898	0.446	8.952	10.839	897
<i>polstab</i>	0.824	0.419	-0.475	1.759	744
<i>regqual</i>	1.197	0.454	-0.184	2.040	744
<i>rulelaw</i>	1.160	0.626	-0.634	2.125	744
<i>voiceaccount</i>	1.153	0.353	-0.292	1.801	744

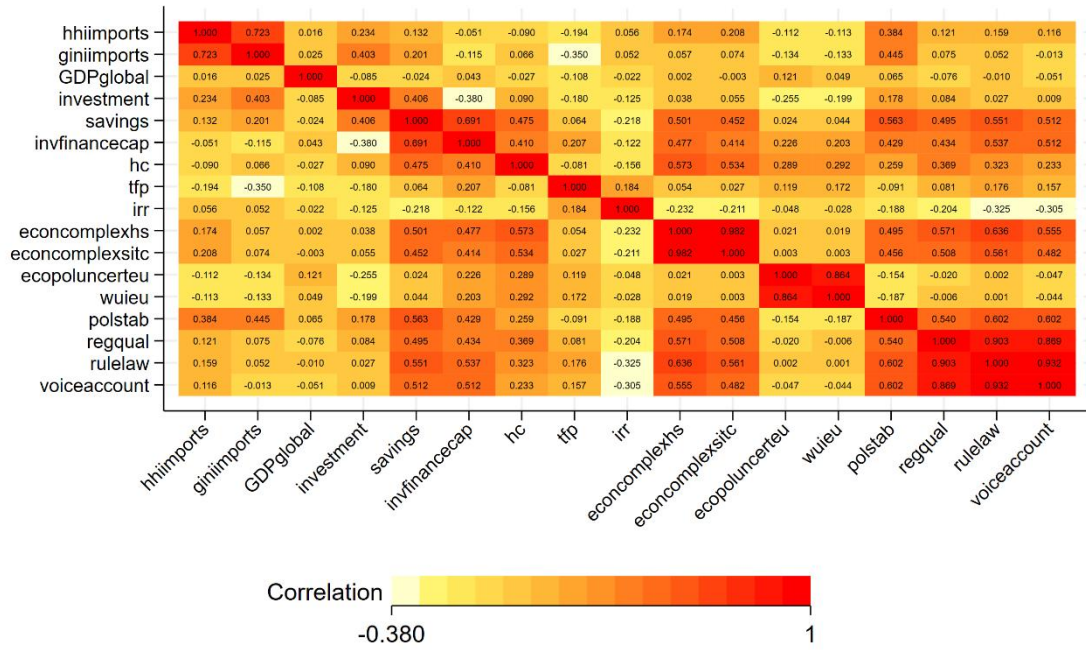
Note: Authors' calculations.

Figure 1. Heatmap with correlation matrix for exports, 1995-2023.



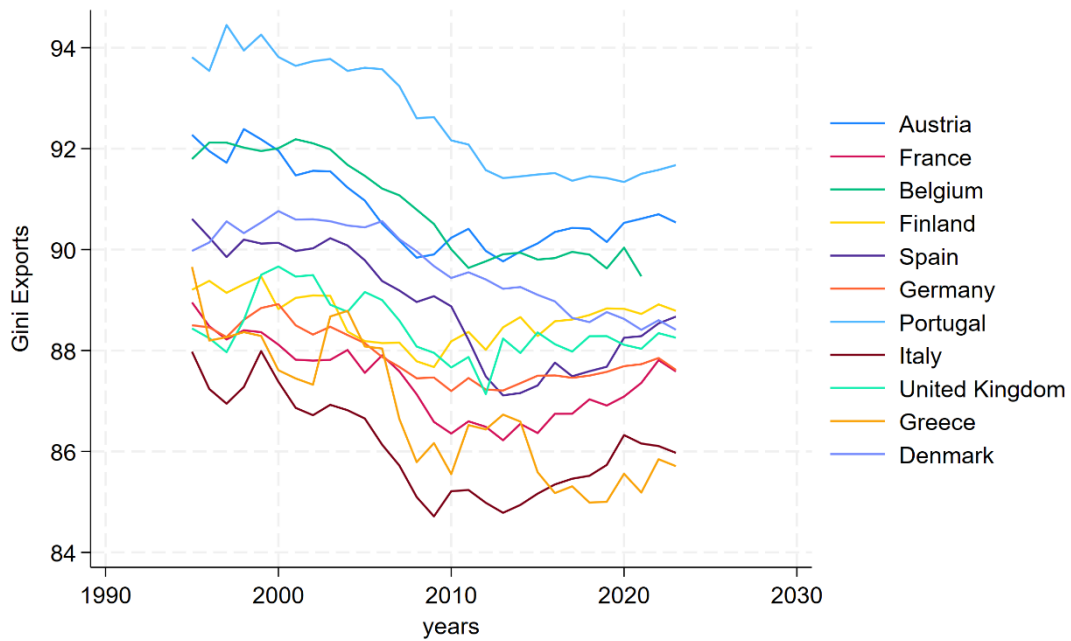
Note: Authors' calculations.

Figure 2. Heatmap with correlation matrix for imports, 1995-2023.



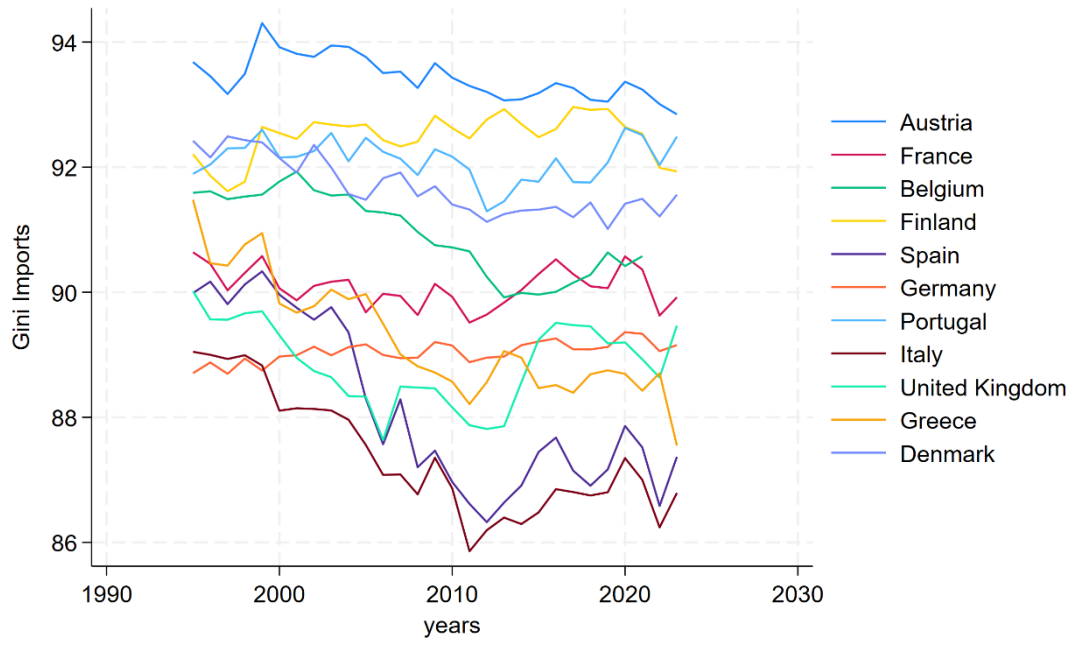
Note: Authors' calculations.

Figure 3. Gini Coefficients for selected countries' exports, 1995-2023.



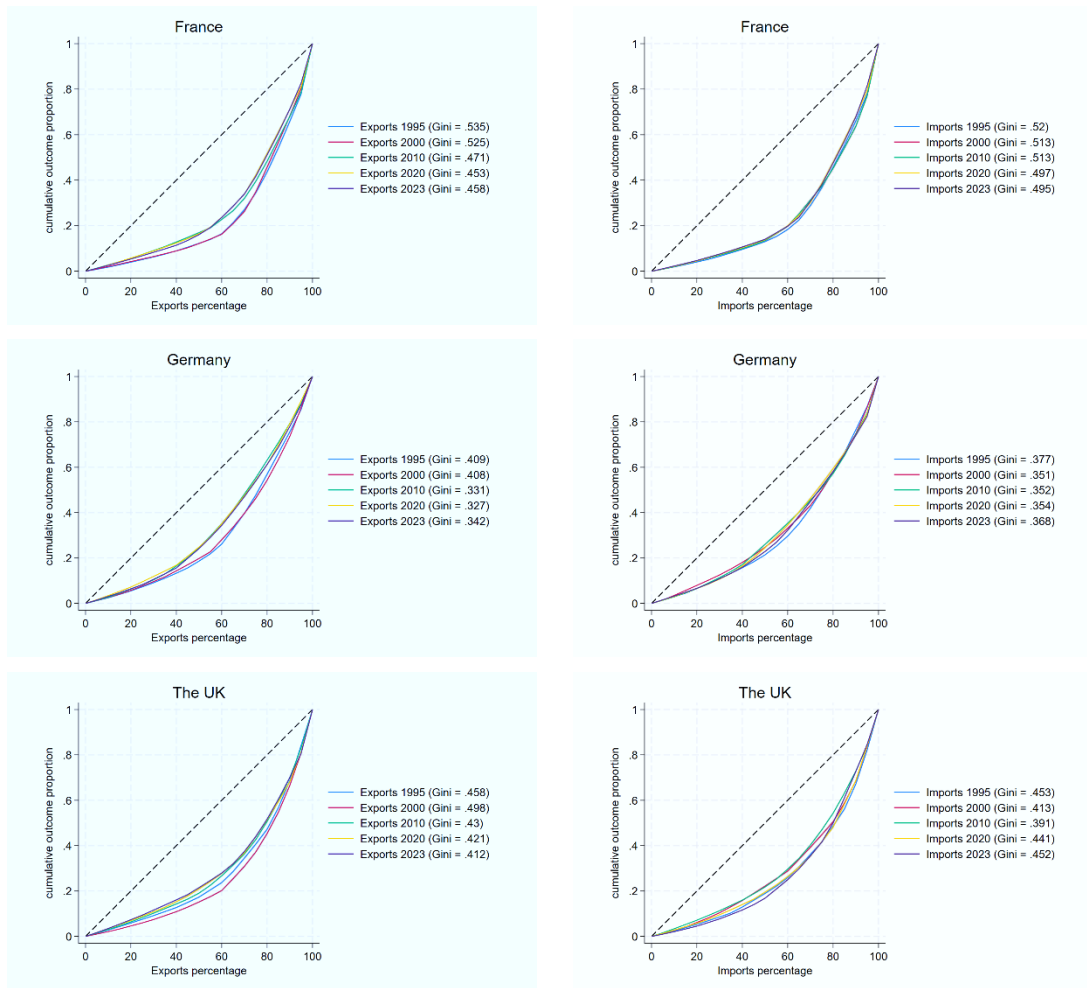
Note: Authors' calculations.

Figure 4. Gini Coefficients for selected countries' imports, 1995-2023.



Note: Authors' calculations.

Figure 5. Lorenz Curves and Gini Coefficients for exports and imports, 1995-2023.
Panel 5A: Exports Lorenz Curve **Panel 5B: Imports Lorenz Curve**



These graphs display the Lorenz curves for exports (left) and imports (right) in France, Germany, and the UK for the years 1995, 2000, 2010, 2020, and 2023. The 45-degree line represents perfect equality, and a Lorenz curve for each year is shown as indicated in the graph legend. The Gini coefficient for each curve, denoting the degree of inequality, is provided in brackets. Source: Author's calculations.

3. Findings

In this section, we report the main results of our estimations, namely, the macroeconomic, the institutional and uncertainty determinants of both exports and imports concentration partnership in Europe.

3.1. Macroeconomic determinants

Table 2 presents the findings on the macroeconomic determinants of the Herfindahl-Hirschman Index (HHI) for export partner concentration. The analysis reveals that global economic growth exerts a concentrating effect on exports, leading to a reduction in the number of trade partners. This trend is similarly observed, albeit to a lesser extent, with

domestic investment and savings. This concentration can be attributed to the increased efficiency and stronger economic ties that come with larger, more established markets.

In contrast, human capital and total factor productivity demonstrate significant diversifying effects. These results suggest that countries with higher levels of education and productivity are less dependent on a limited number of trade partners, thereby mitigating their exposure to external shocks and competitive pressures. Furthermore, the capacity for investment financing and the real internal rate of return also contribute to a broader distribution of exports across multiple partners. These effects suggest that economies with higher levels of education and productivity diversify the most and as a consequence are more resilient to any possible disturbance the market may report.

Table 3 extends the analysis to the Gini Index of export partners. Consistent with the HHI results, increases in global economic activity and domestic investment are associated with a concentration of exports among fewer partners. However, human capital emerges as the most influential factor in diversifying export partners, underscoring the critical role of higher education and productivity in reducing export concentration. Investment capacity and real rates of return continue to exhibit relatively modest diversifying impacts.

These findings highlight the complex interplay between macroeconomic variables and export partner concentration, emphasizing the importance of human capital and productivity in fostering a more diversified and resilient export structure. By spreading their trade activities across a wider array of partners, countries can avoid over-reliance on any single market, reducing vulnerability to economic downturns and fostering a more robust trade network.

Table 2 – Results for macroeconomic determinants (HHI Exports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$GDP_{global,t-1}$	0.802*** (0.142)	0.842*** (0.136)	0.848*** (0.142)	0.534** (0.220)	0.497** (0.216)	0.605*** (0.211)	0.584*** (0.222)	0.668*** (0.138)	0.681*** (0.132)	0.687*** (0.136)
$invfinancecap_{t-1}$	-0.035** (0.016)				-0.035** (0.016)			-0.036** (0.015)		
irr_{t-1}	-0.094*** (0.025)	-0.095*** (0.025)	-0.117*** (0.024)	-0.099*** (0.025)	-0.082*** (0.026)	-0.086*** (0.025)	-0.106*** (0.024)			
$investment_{t-1}$		0.065*** (0.016)				0.063*** (0.015)			0.076*** (0.014)	
$savings_{t-1}$			0.026 (0.018)				0.023 (0.018)			0.040** (0.019)
hc_{t-1}				-1.663* (0.989)	-1.744* (0.969)	-1.353 (0.987)	-1.498 (1.006)			
tfp_{t-1}								-2.925*** (0.714)	-3.512*** (0.679)	-3.799*** (0.725)
Obs.	775	775	775	775	775	775	775	775	775	775
R^2	0.823	0.826	0.822	0.822	0.824	0.827	0.822	0.824	0.829	0.824

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table 3 - Results for macroeconomic determinants (Gini Exports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$GDP_{global,t-1}$	0.679*** (0.109)	0.711*** (0.106)	0.715*** (0.109)	0.252* (0.135)	0.221* (0.132)	0.307** (0.132)	0.285** (0.135)	0.671*** (0.109)	0.682*** (0.103)	0.684*** (0.107)
$invfinancecap_{t-1}$	-0.028*** (0.008)				-0.029*** (0.008)			-0.030*** (0.008)		
irr_{t-1}	-0.023 (0.016)	-0.025* (0.014)	-0.042*** (0.016)	-0.019 (0.018)	-0.005 (0.017)	-0.009 (0.015)	-0.024 (0.018)			
$investment_{t-1}$		0.052*** (0.008)				0.049*** (0.008)			0.054*** (0.008)	
$savings_{t-1}$			0.020* (0.010)				0.015 (0.010)			0.021* (0.011)
hc_{t-1}				-2.549*** (0.461)	-2.616*** (0.456)	-2.308*** (0.471)	-2.438*** (0.471)			
tfp_{t-1}								-0.185 (0.427)	-0.653* (0.395)	-0.762* (0.451)
Obs.	775	775	775	775	775	775	775	775	775	775
R^2	0.921	0.924	0.920	0.922	0.923	0.926	0.922	0.920	0.924	0.919

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table 4 presents the results for the Herfindahl-Hirschman Index (HHI) of import partner concentration. While the concentrating effects of global economic activity are evident, human capital is now associated with more concentrated imports. This phenomenon may be attributed to economic development leading to imports being concentrated on a narrower range of products and, consequently, fewer source countries (see Imbs and Wacziarg, 2003). In this context, both investment and savings levels exhibit significant diversifying effects on import partner concentration, whereas productivity and real rates of return are generally non-significant.

Table 5 examines the results for the Gini Index of import partner concentration. The findings continue to indicate robust concentrating effects of external economic activity and domestic human capital. Total factor productivity and real rates of return also show significant impacts on import partner concentration, while investment conditions appear to have no significant effect.

This evidence underscores a notable inverse relationship between education and productivity levels on export and import partner concentration, respectively. It suggests that as countries develop, their exports become more diversified among trade partners, while their imports become more concentrated on specific source countries.

Table 4 – Results for macroeconomic determinants (HHI Imports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$GDP_{global,t-1}$	0.717*** (0.185)	0.696*** (0.179)	0.667*** (0.179)	1.260*** (0.248)	1.271*** (0.247)	1.202*** (0.243)	1.166*** (0.246)	0.644*** (0.207)	0.638*** (0.201)	0.629*** (0.200)
$invfinancecap_{t-1}$	0.009 (0.014)				0.011 (0.014)			0.012 (0.014)		
irr_{t-1}	-0.020 (0.033)	-0.029 (0.028)	-0.004 (0.029)	-0.038 (0.033)	-0.043 (0.034)	-0.048* (0.029)	-0.025 (0.031)			
$investment_{t-1}$		-0.055*** (0.014)				-0.052*** (0.014)			-0.051*** (0.014)	
$savings_{t-1}$			-0.048*** (0.017)				-0.043*** (0.017)			-0.043** (0.019)
hc_{t-1}				3.145*** (1.080)	3.170*** (1.079)	2.893*** (1.072)	2.835*** (1.085)			
tfp_{t-1}								-1.531 (0.967)	-1.254 (0.901)	-0.847 (1.005)
Obs.	775	775	775	775	775	775	775	775	775	775
R^2	0.914	0.916	0.916	0.916	0.916	0.917	0.917	0.915	0.916	0.916

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table 5 - Results for macroeconomic determinants (Gini Imports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
$GDP_{global,t-1}$	0.430*** (0.080)	0.434*** (0.079)	0.439*** (0.081)	0.764*** (0.137)	0.763*** (0.139)	0.778*** (0.139)	0.790*** (0.143)	0.522*** (0.084)	0.523*** (0.084)	0.523*** (0.084)
$invfinancecap_{t-1}$	-0.002 (0.007)				-0.002 (0.007)			-0.003 (0.007)		
irr_{t-1}	0.054*** (0.014)	0.055*** (0.013)	0.051*** (0.014)	0.039*** (0.014)	0.040*** (0.015)	0.042*** (0.013)	0.036** (0.014)			
$investment_{t-1}$		0.010* (0.006)				0.013** (0.006)			0.004 (0.006)	
$savings_{t-1}$			0.008 (0.008)				0.012 (0.008)			0.000 (0.008)
hc_{t-1}				1.905*** (0.539)	1.901*** (0.544)	1.966*** (0.546)	1.989*** (0.559)			
tfp_{t-1}								1.991*** (0.297)	1.949*** (0.297)	1.959*** (0.313)
Obs.	775	775	775	775	775	775	775	775	775	775
R^2	0.908	0.908	0.908	0.910	0.910	0.910	0.910	0.910	0.910	0.910

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

3.2. Institutional and uncertainty determinants

In this subsection, we present the findings on the structural and institutional determinants of the Herfindahl-Hirschman Index (HHI) and Gini coefficients for trade partner concentration. Tables 6 and 7 display the results for export partner concentration, while Tables 8 and 9 present the results for import partner concentration.

The first major finding is the robust negative effect of economic complexity, underscoring the importance of structural market conditions in the distribution of trade across different partners. The results for both the HHI and Gini coefficients for exports suggest that higher economic complexity is associated with lower partner concentration. Additionally, domestic political stability appears to significantly increase export concentration, whereas other institutional indicators yield mixed results.

These findings become more pronounced when considering variables of economic and political uncertainty, which reflect periods of regional instability and increased risks. In such contexts, the results suggest that countries tend to diversify exports across a larger number of partners, possibly as a mechanism to mitigate exposure and commercial liability. This diversification strategy seems to complement domestic political conditions, where higher stability during periods of increased tension could represent a “safe haven” behavior. Consequently, countries may diversify trade across partners, and those with more stable conditions could gain potential advantages.

Institutional characteristics, however, are generally non-significant in most cases, while economic complexity continue to exhibit diversifying effects by reducing export partner concentration. This reinforces previous findings and highlights the importance of structural conditions related to human capital and productivity levels.

In Tables 8 and 9, the evidence for import partner concentration differs notably. Although economic complexity does not significantly affect the HHI, it has significant concentrating effects on the Gini coefficient for imports. This finding supports the previously discussed mechanisms linking economic development with production diversification up to a certain level (Imbs and Wacziarg, 2003).

Conversely, regional uncertainty is associated with decreases in import partner concentration, while most institutional determinants remain non-significant, except for the rule of law. This may partly reflect the regulatory power of certain governments in limiting the reach of foreign products in domestic markets, as well as intrinsic features of trade agreements and commercial relationships.

In summary, our results suggest that the main determinants of trade partner concentration are human capital levels, total factor productivity, and economic complexity. Although their effects differ between exports and imports, these factors are crucial for partner concentration. Improvements in these areas, which are also linked to economic development, seem to lead to higher diversification in export partners and lower external exposure. Conversely, more qualified, productive, and complex economies tend to have higher import partner concentration and greater reliance on these counterpart countries.

Finally, these results remain robust even when considering the concentrating effects of global economic activity and the diversifying impacts of periods with increased regional economic and political uncertainty. The former may represent increased demand for exported products, while the latter may incentivize diversification of trade across

partners. These aspects are relevant for a comprehensive analysis and indicate novel features in the dynamics of trade concentration across partners.

Table 6 – Results for structural and institutional determinants (HHI Exports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>econcomplexhs</i> _{<i>t</i>-1}	-2.238*** (0.497)	-2.260*** (0.484)	-2.843*** (0.536)	-2.294*** (0.551)	-2.298*** (0.537)	-2.795*** (0.582)	-2.219*** (0.475)	-2.227*** (0.462)	-2.728*** (0.515)	-1.933*** (0.521)	-1.904*** (0.512)	-2.233*** (0.551)
<i>ecopoluncerteu</i> _{<i>t</i>-1}	-1.440*** (0.123)			-1.430*** (0.124)			-1.364*** (0.129)			-1.349*** (0.129)		
<i>wuieu</i> _{<i>t</i>-1}		-1.273*** (0.107)			-1.271*** (0.108)			-1.220*** (0.111)			-1.197*** (0.110)	
<i>polstab</i> _{<i>t</i>-1}			1.131*** (0.269)			1.133*** (0.266)			0.881*** (0.265)			0.899*** (0.259)
<i>regqual</i> _{<i>t</i>-1}	-0.312 (0.343)	-0.177 (0.338)	-0.248 (0.381)							-0.937** (0.398)	-0.726* (0.396)	-0.763* (0.422)
<i>rulelaw</i> _{<i>t</i>-1}				0.072 (0.421)	0.055 (0.416)	-0.163 (0.473)				-0.423 (0.477)	-0.559 (0.473)	-0.937* (0.523)
<i>voiceaccount</i> _{<i>t</i>-1}							1.515** (0.601)	1.521** (0.591)	1.786*** (0.671)	2.523*** (0.604)	2.483*** (0.592)	3.037*** (0.671)
Obs.	672	672	672	672	672	672	672	672	672	672	672	672
R ²	0.811	0.815	0.782	0.810	0.815	0.782	0.814	0.818	0.787	0.817	0.821	0.791

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table 7 – Results for structural and institutional determinants (Gini Exports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>econcomplexhs</i> _{<i>t</i>-1}	-0.959*** (0.227)	-0.998*** (0.225)	-1.555*** (0.257)	-0.829*** (0.254)	-0.855*** (0.252)	-1.327*** (0.277)	-0.919*** (0.221)	-0.945*** (0.219)	-1.460*** (0.260)	-0.415 (0.254)	-0.397 (0.256)	-0.756*** (0.285)
<i>ecopoluncerteu</i> _{<i>t</i>-1}	-1.326*** (0.076)			-1.331*** (0.076)			-1.283*** (0.082)			-1.254*** (0.082)		
<i>wuieu</i> _{<i>t</i>-1}		-1.097*** (0.061)			-1.101*** (0.061)			-1.062*** (0.066)			-1.044*** (0.065)	
<i>polstab</i> _{<i>t</i>-1}			1.197*** (0.179)			1.283*** (0.171)			1.056*** (0.173)			1.122*** (0.167)
<i>regqual</i> _{<i>t</i>-1}	0.115 (0.225)	0.244 (0.226)	0.153 (0.265)							0.105 (0.254)	0.293 (0.256)	0.293 (0.276)
<i>rulelaw</i> _{<i>t</i>-1}				-0.286 (0.271)	-0.295 (0.270)	-0.569* (0.327)				-1.165*** (0.326)	-1.305*** (0.325)	-1.687*** (0.372)
<i>voiceaccount</i> _{<i>t</i>-1}							1.032** (0.449)	1.086** (0.451)	1.178** (0.540)	1.845*** (0.479)	1.863*** (0.482)	2.200*** (0.569)
Obs.	672	672	672	672	672	672	672	672	672	672	672	672
R ²	0.883	0.883	0.849	0.883	0.883	0.850	0.885	0.885	0.852	0.889	0.889	0.858

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table 8 – Results for structural and institutional determinants (HHI Imports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>econcomplexhs</i> _{<i>t</i>-1}	-0.098 (0.307)	-0.139 (0.307)	-0.546 (0.335)	0.072 (0.332)	0.044 (0.333)	-0.299 (0.350)	-0.174 (0.314)	-0.203 (0.313)	-0.623* (0.346)	-0.067 (0.359)	-0.057 (0.360)	-0.344 (0.383)
<i>ecopoluncerteu</i> _{<i>t</i>-1}	-1.025*** (0.112)			-1.011*** (0.111)			-1.035*** (0.114)			-1.029*** (0.115)		
<i>wuieu</i> _{<i>t</i>-1}		-0.802*** (0.101)			-0.802*** (0.101)			-0.817*** (0.102)			-0.805*** (0.103)	
<i>polstab</i> _{<i>t</i>-1}			0.876*** (0.193)			0.924*** (0.195)			0.899*** (0.203)			0.909*** (0.203)
<i>regqual</i> _{<i>t</i>-1}	-0.671** (0.261)	-0.569** (0.264)	-0.635** (0.289)							-0.567* (0.327)	-0.418 (0.331)	-0.413 (0.360)
<i>rulelaw</i> _{<i>t</i>-1}				-0.540* (0.296)	-0.544* (0.298)	-0.741** (0.314)				-0.105 (0.383)	-0.230 (0.384)	-0.532 (0.396)
<i>voiceaccount</i> _{<i>t</i>-1}							-0.641* (0.356)	-0.576 (0.359)	-0.546 (0.423)	-0.147 (0.472)	-0.092 (0.479)	0.149 (0.540)
Obs.	672	672	672	672	672	672	672	672	672	672	672	672
R ²	0.911	0.909	0.902	0.910	0.909	0.902	0.910	0.909	0.901	0.911	0.909	0.902

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table 9 – Results for structural and institutional determinants (Gini Imports)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>econcomplexhs</i> _{<i>t</i>-1}	0.909*** (0.155)	0.886*** (0.156)	0.595*** (0.164)	0.711*** (0.162)	0.693*** (0.163)	0.470*** (0.173)	0.943*** (0.157)	0.926*** (0.158)	0.646*** (0.168)	0.746*** (0.181)	0.752*** (0.182)	0.557*** (0.197)
<i>ecopoluncerteu</i> _{<i>t</i>-1}	-0.607*** (0.067)			-0.609*** (0.066)			-0.589*** (0.068)			-0.600*** (0.070)		
<i>wuieu</i> _{<i>t</i>-1}		-0.480*** (0.058)			-0.478*** (0.058)			-0.462*** (0.060)			-0.469*** (0.060)	
<i>polstab</i> _{<i>t</i>-1}			0.715*** (0.116)			0.685*** (0.112)			0.663*** (0.120)			0.655*** (0.117)
<i>regqual</i> _{<i>t</i>-1}	0.215 (0.137)	0.275** (0.139)	0.210 (0.156)							-0.127 (0.178)	-0.040 (0.179)	-0.025 (0.187)
<i>rulelaw</i> _{<i>t</i>-1}				0.516*** (0.164)	0.513*** (0.165)	0.358** (0.175)				0.477** (0.235)	0.404* (0.237)	0.209 (0.234)
<i>voiceaccount</i> _{<i>t</i>-1}							0.548** (0.234)	0.587** (0.237)	0.530* (0.280)	0.276 (0.292)	0.309 (0.296)	0.395 (0.331)
Obs.	672	672	672	672	672	672	672	672	672	672	672	672
R ²	0.890	0.888	0.882	0.891	0.889	0.882	0.890	0.889	0.882	0.891	0.889	0.882

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

4. Conclusions

In this study, we investigate the influence of macroeconomic, institutional, and uncertainty factors on the concentration (or diversification) of exports and imports for 31 European Economies from 1995 to 2023. To do so, we first compute the Gini and Herfindahl-Hirschman indexes for product exports and imports of each country in each year as a proxy for concentration (diversification) and then apply OLS fixed effects to uncover its main determinants.

Our findings highlight several key insights: global GDP growth tends to heighten export concentration, whereas higher internal rates of return foster export diversification but diminish import diversification. This suggests that while economic growth can lead to a reliance on fewer trade partners, fostering a stable and productive domestic environment can counterbalance this effect by promoting diversification. On the

institutional side, stronger political stability, reflecting greater institutional robustness, leads to more concentrated export and import destinations. This diversification is crucial for enhancing economic resilience, as it spreads risk across multiple partners and reduces vulnerability to external shocks. Additionally, European uncertainty reduces the concentration of both the origin and destination countries for imports and exports, respectively.

Our study has significant implications for policymakers. To foster a resilient trade environment, policies should aim to enhance human capital and productivity, which are key drivers of diversification. Strengthening institutional frameworks and ensuring political stability can further support diversified export markets, reducing dependency on a limited number of trade partners. Additionally, addressing sources of economic uncertainty and promoting stable investment climates can help maintain a balanced trade portfolio. By implementing these strategies, countries can potentially better navigate the complexities of international trade, safeguard against economic downturns, and sustain long-term growth.

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Appendix

Table A1 – Robustness check results for structural and institutional determinants (HHI Exports), with econcomplexsitc

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>econcomplexsitc</i> _{<i>t</i>-1}	-1.936*** (0.468)	-1.946*** (0.450)	-2.235*** (0.518)	-1.939*** (0.503)	-1.929*** (0.486)	-2.122*** (0.549)	-1.909*** (0.444)	-1.906*** (0.427)	-2.127*** (0.493)	-1.569*** (0.468)	-1.537*** (0.452)	-1.562*** (0.504)
<i>ecopoluncerteu</i> _{<i>t</i>-1}	-1.499*** (0.128)			-1.491*** (0.128)			-1.424*** (0.133)			-1.394*** (0.132)		
<i>wuieu</i> _{<i>t</i>-1}		-1.318*** (0.110)			-1.317*** (0.110)			-1.265*** (0.113)			-1.232*** (0.112)	
<i>polstab</i> _{<i>t</i>-1}			1.074*** (0.275)			1.112*** (0.271)			0.819*** (0.271)			0.861*** (0.264)
<i>regqual</i> _{<i>t</i>-1}	-0.305 (0.344)	-0.165 (0.340)	-0.239 (0.385)							-0.844** (0.399)	-0.628 (0.397)	-0.638 (0.426)
<i>rulelaw</i> _{<i>t</i>-1}				-0.068 (0.405)	-0.090 (0.400)	-0.409 (0.462)				-0.647 (0.450)	-0.790* (0.445)	-1.335*** (0.501)
<i>voiceaccount</i> _{<i>t</i>-1}							1.487** (0.589)	1.499** (0.581)	1.836*** (0.669)	2.604*** (0.594)	2.569*** (0.584)	3.282*** (0.674)
Obs.	672	672	672	672	672	672	672	672	672	672	672	672
<i>R</i> ²	0.809	0.813	0.777	0.809	0.813	0.777	0.812	0.817	0.781	0.815	0.820	0.787

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table A2 – Robustness check results for structural and institutional determinants (Gini Exports), with econcomplexsitc

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>econcomplexsitc</i> _{t-1}	-0.806*** (0.204)	-0.818*** (0.200)	-1.116*** (0.245)	-0.676*** (0.222)	-0.670*** (0.217)	-0.875*** (0.257)	-0.759*** (0.201)	-0.758*** (0.198)	-1.023*** (0.248)	-0.311 (0.218)	-0.275 (0.215)	-0.366 (0.251)
<i>ecopoluncerteu</i> _{t-1}	-1.351*** (0.077)			-1.354*** (0.077)			-1.308*** (0.083)			-1.264*** (0.083)		
<i>wuieu</i> _{t-1}		-1.117*** (0.062)			-1.119*** (0.061)			-1.081*** (0.066)			-1.050*** (0.066)	
<i>polstab</i> _{t-1}			1.154*** (0.181)			1.265*** (0.173)			1.007*** (0.175)			1.094*** (0.168)
<i>regqual</i> _{t-1}	0.116 (0.224)	0.246 (0.226)	0.152 (0.266)							0.127 (0.255)	0.317 (0.257)	0.346 (0.279)
<i>rulelaw</i> _{t-1}				-0.345 (0.260)	-0.365 (0.259)	-0.729** (0.318)				-1.227*** (0.314)	-1.377*** (0.312)	-1.905*** (0.361)
<i>voiceaccount</i> _{t-1}							1.023** (0.447)	1.080** (0.449)	1.220** (0.543)	1.873*** (0.482)	1.899*** (0.485)	2.354*** (0.575)
Obs.	672	672	672	672	672	672	672	672	672	672	672	672
R ²	0.883	0.882	0.845	0.883	0.882	0.847	0.885	0.884	0.848	0.889	0.889	0.857

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table A3 – Robustness check results for structural and institutional determinants (HHI Imports), with econcomplexsitc

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>econcomplexsitc</i> _{t-1}	-0.039 (0.273)	-0.050 (0.273)	-0.268 (0.287)	0.093 (0.288)	0.097 (0.289)	-0.051 (0.297)	-0.121 (0.280)	-0.120 (0.279)	-0.347 (0.298)	-0.005 (0.309)	0.031 (0.308)	-0.048 (0.319)
<i>ecopoluncerteu</i> _{t-1}	-1.028*** (0.114)			-1.009*** (0.113)			-1.039*** (0.116)			-1.030*** (0.117)		
<i>wuieu</i> _{t-1}		-0.805*** (0.102)			-0.801*** (0.102)			-0.821*** (0.104)			-0.806*** (0.105)	
<i>polstab</i> _{t-1}			0.847*** (0.191)			0.911*** (0.194)			0.866*** (0.201)			0.886*** (0.202)
<i>regqual</i> _{t-1}	-0.674*** (0.261)	-0.574** (0.264)	-0.643** (0.289)							-0.560* (0.324)	-0.409 (0.329)	-0.381 (0.358)
<i>rulelaw</i> _{t-1}				-0.547* (0.290)	-0.562* (0.293)	-0.824*** (0.313)				-0.140 (0.369)	-0.279 (0.369)	-0.691* (0.387)
<i>voiceaccount</i> _{t-1}							-0.641* (0.356)	-0.574 (0.360)	-0.516 (0.423)	-0.123 (0.472)	-0.058 (0.477)	0.271 (0.537)
Obs.	672	672	672	672	672	672	672	672	672	672	672	672
R ²	0.911	0.909	0.902	0.910	0.909	0.902	0.910	0.909	0.901	0.911	0.909	0.902

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table A4 – Robustness check results for structural and institutional determinants (Gini Imports), with econcomplexsitc

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<i>econcomplexsitc_{t-1}</i>	0.909*** (0.142)	0.903*** (0.142)	0.731*** (0.142)	0.750*** (0.146)	0.751*** (0.146)	0.647*** (0.149)	0.947*** (0.144)	0.948*** (0.144)	0.782*** (0.146)	0.789*** (0.159)	0.810*** (0.159)	0.738*** (0.163)
<i>ecopoluncerteu_{t-1}</i>	-0.584*** (0.067)			-0.590*** (0.067)			-0.563*** (0.068)			-0.579*** (0.070)		
<i>wuieu_{t-1}</i>		-0.463*** (0.058)			-0.465*** (0.058)			-0.444*** (0.060)			-0.453*** (0.061)	
<i>polstab_{t-1}</i>			0.698*** (0.114)			0.670*** (0.110)			0.640*** (0.117)			0.634*** (0.114)
<i>regqual_{t-1}</i>	0.203 (0.139)	0.260* (0.140)	0.192 (0.156)							-0.148 (0.174)	-0.063 (0.175)	-0.033 (0.183)
<i>rulelaw_{t-1}</i>				0.508*** (0.164)	0.499*** (0.165)	0.306* (0.173)				0.464** (0.225)	0.386* (0.226)	0.131 (0.221)
<i>voiceaccount_{t-1}</i>							0.570** (0.237)	0.607** (0.240)	0.556** (0.282)	0.322 (0.291)	0.359 (0.295)	0.485 (0.329)
Obs.	672	672	672	672	672	672	672	672	672	672	672	672
R ²	0.891	0.889	0.883	0.892	0.890	0.883	0.891	0.890	0.884	0.892	0.891	0.884

Note: Constant term, country and time fixed effects estimated and omitted for reasons of parsimony. Robust standard errors in parenthesis. *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.