THE IMPORTANCE OF SELECTED STRUCTURAL COMPETITIVENESS INDICATORS FOR EXPORTS: A COMPARATIVE ANALYSIS BETWEEN THE EURO AREA AND GREECE

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ABSTRACT

Structural (non-price) competitiveness departs from price or cost competitiveness and captures a multitude of dimensions, both quantitative and qualitative, affecting a country's trade and openness. Greece over time has lagged behind in key structural competitiveness indicators relative to other euro area countries, but has improved its position in some of the indicators in the recent years, in terms of relative prices and unit labour costs. The paper examines the evolution of selected price and structural competitiveness indicators approximated with institutional quality indicators (published by international organisations), recording the performance of Greece and euro area countries over the last decade, on an annual basis, in order to gain more insight into how exports are affected. A panel regression of an export demand function is estimated for the 19 euro area member countries, separately for each of the selected indicators. It is confirmed that structural competitiveness, along with price competitiveness, has played an important role in determining exports in the euro area and in Greece over the 2007-19 period. Greater sensitivity of Greek exports to institutional quality indicators is found, compared with average euro area exports. This is an indication of the faster pace of refortm implementation in other euro area countries, while the reforms in Greece are in a process of catching up. The implementation of structural reforms in the direction of improving institutional deficiencies has contributed, among other factors, to the observed post-crisis export-led growth in Greece. In conclusion, the pace of reforms already under way should be accelerated and this will be mirrored in the country's structural competitiveness indicators and expressed as better scores and higher rankings converging towards the performance of the other euro area countries.

Keywords: structural competitiveness indicators; competitiveness; exports; panel estimator

JEL classification: F13; F14; C51

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Η ΣΗΜΑΣΙΑ ΕΠΙΛΕΓΜΕΝΩΝ ΔΕΙΚΤΩΝ ΔΙΑΡΘΡΩΤΙΚΗΣ ΑΝΤΑΓΩΝΙΣΤΙΚΟΤΗΤΑΣ ΓΙΑ ΤΙΣ ΕΞΑΓΩΓΕΣ: ΜΙΑ ΣΥΓΚΡΙΤΙΚΗ ΑΝΑΛΥΣΗ ΑΝΑΜΕΣΑ ΣΤΗ ΖΩΝΗ ΤΟΥ ΕΥΡΩ ΚΑΙ ΤΗΝ ΕΛΛΑΔΑ

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ΠΕΡΙΛΗΨΗ

Η μελέτη εξετάζει την εξέλιξη της διαρθρωτικής ανταγωνιστικότητας, η οποία προσεγγίζεται με δείκτες ποιότητας των θεσμών που καταρτίζονται από διεθνείς οργανισμούς, καθώς και την εξέλιξη της ανταγωνιστικότητας ως προς τις τιμές, καταγράφοντας τις σχετικές επιδόσεις της Ελλάδος και των χωρών της ζώνης του ευρώ κατά τη διάρκεια της τελευταίας δεκαετίας, σε ετήσια βάση. Στη συνέχεια, μελετά την επίδραση των παραπάνω δεικτών στις εξαγωγές. Η διαρθρωτική ανταγωνιστικότητα διαφοροποιείται από την ανταγωνιστικότητα σε όρους τιμών ή κόστους εργασίας. Υπολογίζεται με βάση διαφορετικές προσεγγίσεις, τόσο ποσοτικές όσο και ποιοτικές, και διερευνάται η επίδρασή της στις διεθνείς εμπορικές συναλλαγές και την εξωστρέφεια μιας χώρας. Η Ελλάδα καταγράφει διαχρονικά μικρότερη βελτίωση σε βασικούς δείκτες διαρθρωτικής ανταγωνιστικότητας σε σχέση με άλλες χώρες της ζώνης του ευρώ, αλλά τα τελευταία χρόνια έχει βελτιώσει τη θέση της όσον αφορά την ανταγωνιστικότητα ως προς τις σχετικές τιμές ή το κόστος εργασίας ανά μονάδα προϊόντος. Εκτιμώνται παλινδρομήσεις σε μορφή πάνελ της συνάρτησης ζήτησης εξαγωγών για τις 19 χώρες-μέλη της ζώνης του ευρώ, με τη χρήση χωριστών πάνελ για κάθε έναν από τους επιλεγμένους δείκτες. Επαληθεύεται ότι, πέραν της ανταγωνιστικότητας των τιμών, και η διαρθρωτική ανταγωνιστικότητα αποτελεί σημαντικό προσδιοριστικό παράγοντα των εξαγωγών της ζώνης του ευρώ και της Ελλάδος την περίοδο 2007-2019. Διαπιστώνεται μεγαλύτερη ευαισθησία των ελληνικών εξαγωγών στους δείκτες ποιότητας των θεσμών, σε σχέση με το μέσο όρο των εξαγωγών της ζώνης του ευρώ. Η διαφορά αυτή εκφράζει την ταχύτερη υλοποίηση μεταρρυθμίσεων στις άλλες χώρες της ζώνης του ευρώ από ό,τι στην Ελλάδα, η οποία ωστόσο πρόσφατα έχει κάνει βήματα βελτίωσης του ανταγωνιστικού της πλεονεκτήματος. Επίσης, καταδεικνύεται ότι η υλοποίηση διαρθρωτικών μεταρρυθμίσεων προς την κατεύθυνση της βελτίωσης των θεσμικών ελλείψεων έχει συνεισφέρει, μεταξύ άλλων παραγόντων, στην παρατηρούμενη αύξηση των ελληνικών εξαγωγών μετά την οικονομική κρίση. Συμπεραίνεται ότι ο ρυθμός υλοποίησης των μεταρρυθμίσεων που έχουν ήδη ξεκινήσει θα πρέπει να επιταχυνθεί και αυτό θα αντικατοπτριστεί στους δείκτες διαρθρωτικής ανταγωνιστικότητας της χώρας με υψηλότερες βαθμολογίες, οδηγώντας σε σύγκλιση προς τις επιδόσεις των άλλων χωρών της ζώνης του ευρώ και περαιτέρω ενίσχυση των εξαγωγών.

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1 INTRODUCTION

During the global financial crisis, the euro area experienced significant heterogeneity in external imbalances across countries, which was related to cross-country differences in competitiveness. Research evidence put emphasis on the important role of non-price competitiveness factors (NPCFs) that were shown to significantly explain export variability, a key determinant of trade performance.[1] These findings form the basis for the interpretation of phenomena such as the "Spanish paradox", according to which a country's export shares in major markets increase while its price/cost competitiveness decreases. Improvements in trade performance are then attributed to the positive effect of NPCFs (see Cardoso et al. 2012; Giordano and Zollino 2016). A general conclusion of this literature confirms that NPCFs evolve differently across euro area countries, accounting for the differences in external imbalances.

The concept of competitiveness has received various definitions related to its different aspects. Originally in trade, competitiveness assessed price or cost competitiveness that refers to relative export prices or the terms of trade, whereby a country's domestic prices or costs are compared with the respective international prices or costs. Non-price competitiveness departs from the above in the sense that it is not associated with prices or costs. It is extended to take into account different perspectives and captures a multitude of dimensions, not only quantitative but also qualitative, affecting a country's trade and openness. The World Economic Forum defines competitiveness as "the set of institutions, policies and factors that determine the level of productivity of a country". These NPCFs encompass micro and structural issues, such as product quality, productivity, technology advancements through R&D improvements, labour market and product market institutions, the quality of the regulatory environment and justice, market flexibility, economic and political freedom, the fight against corruption, transparency and the quality of infrastructure, and reflect the country's current situation and the scope for further reforms.

The main goal of this study is twofold. Firstly, it presents the evolution of selected price and structural competitiveness indicators with regard to institutional quality in various sectors of economic activity, recording the performance of Greece and euro area countries over the last decade on an annual basis. Further comparisons of Greece's average performance with the euro area average are performed. Tracking the evolution of structural competitiveness for Greece and determining the country's position among euro area countries is important, since relative improvement in this respect can contribute to the gradual recovery of the Greek economy from one of the deepest recessions ever and lead to policy recommendations on achieving and sustaining growth. The results have implications for identifying areas of structural competitiveness where improvement is needed, in order to increase export performance and economic growth.

Secondly, the importance of institutional quality indicators in explaining exports is examined. Previous research finds that the quality of institutions affects economic growth and development as well as employment and investment (Hämäläinen 2003; Acemoglu et al. 2001; Paldam and Gundlach 2008; Drine 2012). Nico-

1 Standard export demand equations consider price competitiveness, which is usually expressed by real effective exchange rates and external demand to explain exports. However, it has been shown that such a type of estimation explains only 55% of export variability (see ECB 2012).

letti and Scarpetta (2003), for instance, find that divergences in institutional-regulatory patterns, as well as rigidities in the labour market and entrepreneurial activities, have unfavourable effects on productivity and are responsible for the observed dispersion of growth rates in OECD countries during the 2000s; expanding on the above mentioned rationale, trade literature has explored the effect of institutional features on export performance. Adding to the robustness of these results, we augment the traditional export demand equation with a selection of institutional quality indicators, as compiled by a large number of organisations, in order to gain more insight into how inefficient institutions affect exports.[2] A separate panel regression for the 19 euro area member countries is estimated for each indicator. The effect for Greece in particular is derived for comparison purposes. It is verified that structural competitiveness, along with price competitiveness, plays an important role in determining exports in the euro area and in Greece over the 2007-19 period. Improvements in institutional quality that have been observed for the euro area and for Greece have been shown to foster the use of international trade channels and increase trade flows, exports and openness, thereby contributing to the internationalisation of the markets and leading to growth, economic development and, consequently, improved prosperity. Further, regarding Greece in particular, since the recovery from the crisis up until 2019 was to a large extent export-driven, the exploration of the role of non-price competitiveness gains importance. The present study, in line with related research, concludes that the implementation of structural reforms in the direction of improving institutional deficiencies may have contributed, among other factors, to the observed post-crisis export-led growth in Greece.

This paper consists of five sections. Following the introduction, Section 2 provides a review of the relevant literature. Section 3 provides information on price and structural competitiveness indicators for Greece and compares them with the euro area average. The empirical specification exploring the relationship between exports and competitiveness is defined and estimated in Section 4. Section 5 presents the conclusions of the empirical outcome and policy implications.

2 LITERATURE REVIEW

As mentioned in the introduction, the trade literature that has emerged during the years of the global financial crisis focuses on non-price competition to explain export behaviour and, indeed, evidence supports the existence of NPCFs. This approach draws on the so-called "new trade theory" developed in the late 1980s (Krugman 1989). According to this theory, the competitiveness of a country is a broader concept depending on other parameters besides price and cost, i.e. the so-called non-price competitiveness factors. These are more qualitative factors based on monopolistic competition heterogeneity among firms rather than countries – giving a lesser role to comparative advantage. Through technological change or innovation, exporters introduce new products of different quality or variety, which are more difficult to substitute, and they enjoy monopolistic power. These factors are considered as firm-specific and include, on the supply side, technological competitiveness and innovation intensity, which are proxied by R&D expenditure and spending on innovation activities, as well as by the number of patents, or are more of a structural nature, such as human capital, i.e. education, beyond the traditional variables (foreign demand and price/cost competitiveness) and have been used as proxies for NPCFs in the export equation.[3,4]

2 The determinants of a country's export performance besides global demand for its products and price competitiveness –as export prices depend on the exchange rate and unit production costs– include an additional set of non-price factors such as quality, innovation, design, brand image, distribution networks and customer support services (see DG Trésor 2014).

3 The significance of R&D expenditure is confirmed for the euro area, the United Kingdom, the United States and Japan (see ECB 2005).

4 The literature also includes foreign direct investment (FDI), inward or outward, to take into account innovation and technology. However, the results are less clear since a large part of the period covered comprises the financial crisis, during which FDI flows were subdued.

In this context, non-price competitiveness effects have been assimilated into productivity effects. The relevant empirical literature introduces total factor productivity (TFP) in the export demand equation to capture the effects of NPCFs. Giordano and Zollino (2016), for example, find a positive and significant impact of TFP on the exports of the largest euro area countries. In a similar vein, the literature embodies effects from the services sector, as measured by the contribution of TFP to value added in the financial, real estate and other sectors.

A more agnostic approach considers NPCFs as unobservable and identifies them with the residuals of a traditional export demand equation (see Xifre 2019; Monteagudo and Montaruli 2009; and Andersen et al. 2012). The strand of literature that deals with the effect of product quality overcomes the empirical problem that it is not directly observable and connects it with the higher prices that consumers are willing to pay. The drawback of this approach is that the use of highly disaggregated data is necessary in order to calculate unit values, which however reflect not only differences in quality, but also variations in a product's costs.

An emerging body of literature provides evidence regarding improvements in the quality of institutions, which can lead to economies of scale and product differentiation as a source of trade, explaining a country's evolution of exports (see also Melitz 2003). Levchenco (2007) considers institutional differences among countries as a source of comparative advantage. It is shown, using a large number of countries and across industries, that the quality of contracts affects imports. Several alternative measures of distortions in institutional intensity are used for robustness, adopting weighting schemes such as the Gini or the Herfindahl indices, to derive institutional inequality in terms of contract enforcement, and capital and skill intensity are added and shown to be significant in explaining imports.

Bournakis and Tsoukis (2013) emphasise the importance of institutional rigidities in affecting export performance. Adopting market structure indicators such as barriers to entrepreneurship, barriers to competition and barriers to FDI, they find that their interaction with the more traditional measure of technological competitiveness, namely the R&D effectiveness, affects significantly export performance.

Böwer et al. (2014) attribute Greece's stagnant exports to the existence of a competitive gap resulting from low performance in institutional quality (NPCFs), while cost competitiveness records major improvements. This evidence refers to the last two decades and is more pronounced during the years of the economic crisis. A gravity model in trade is augmented to include indicators of structural competitiveness such as the World Economic Forum (WEF)'s Global Competitiveness Index (GCI), the World Bank's Doing Business and Worldwide Governance Indicators (WGI) and the OECD's Sustainable Governance Indicators (SGI). They claim that "structural reforms must address non-cost competitiveness factors to unlock Greece's export growth potential".

On the other hand, Bierut and Kuziemska-Pawlak (2016) show that the quality of the institutional environment and in particular regulatory quality lead to higher export market shares in Central and Eastern European (CEE) countries. The results regarding the effect of institutions are more robust than those referring to price/cost competitiveness. Their estimation results show that regulatory quality plays the most important role and has a positive impact on export performance.

Cazacu (2015a) shows that economic growth is linked to both price and non-price competitiveness factors. However, fast-growing countries are not necessarily the most competitive, as a shock in GDP levels has a small positive impact on GCI.

Katsoulacos et al. (2015) conclude that a key determinant of competitiveness is the quality of the set of rules and regulations that govern the operation of markets. Low quality of regulation

is generally associated with greater inefficiency and poor economic outcomes. Reforms can have a pivotal role for the restructuring and productive potential of the economy.

Cezar and Cartellier (2019) suggest that the increasing internationalisation of production within global value chains reinforces the dependence of export prices on the prices of imported inputs. The change in relative costs is used as proxy for the price component of competitiveness. The residuals in their equation express the contribution of the non-price component to the change in exports, so the evolution of a country's exports is primarily due to fluctuations in foreign demand and to the effects of global economic conditions.

ILO (2009) comments that reforms can take time, which means that they may not be reflected immediately. Besides, the rankings are competitive, so that if neighbours also make changes, the relative rankings may stay the same, even though all of them have improved their business climates. Finally, reformers should not expect that better scores will immediately attract foreign investment, but should instead understand that a better business climate leads to better domestic investment and prosperity, both key elements for eventually attracting foreign business interest.

Kovačič (2005) notes that countries, which are not among the most innovative ones, often reach economic development by absorption of new technologies from others. However, if a country does not create a good business environment for companies, it will not reach a higher level of development.

Leichter et al. (2010) argue that increased economic and financial integration at the global and regional levels, combined with the large and rising presence of firms from dynamic emerging and developing economies, has augmented pressure on market participants to strengthen competitiveness in both domestic and export markets. To increase a country's competitiveness, policy makers must pursue structural reforms, which boost productivity, increase flexibility in product and labour markets and facilitate firms' adjustment to the new global environment.

Kalimeris (2012) states that there exist several levels of causality in some of the most important macroeconomic variables that the WEF selects to construct its competitiveness index. Porter's Diamond framework does not refer to trade among countries, but is rather a more general analysis of country-specific sources of advantage that enhance the international competitive advantage of firms. Nevertheless, as countries become more open to international trade, they are able to attain higher competitiveness levels, which are reflected in stronger and more sound indices (see Kharlamova and Vertelieva 2013).

Alternatively, Nurbel (2007) offers a definition of ex *ante competitiveness* as driven by the evolution of real exchange rates, while ex *post competitiveness* depends on the state of the current account balance. Finally, Porter et al. (2000) deal with government policies and institutions that promote long-term growth. "National competitiveness" corresponds to the relative quality of a country's economic structures and government institutions for economic growth within the structure of the global economy.

Overall, the above evidence provides a motivation for the present paper, which attests to the important role of NPCFs, as approximated with a selection of institutional quality indicators, regarding the 19 euro area member countries as a whole and Greece.

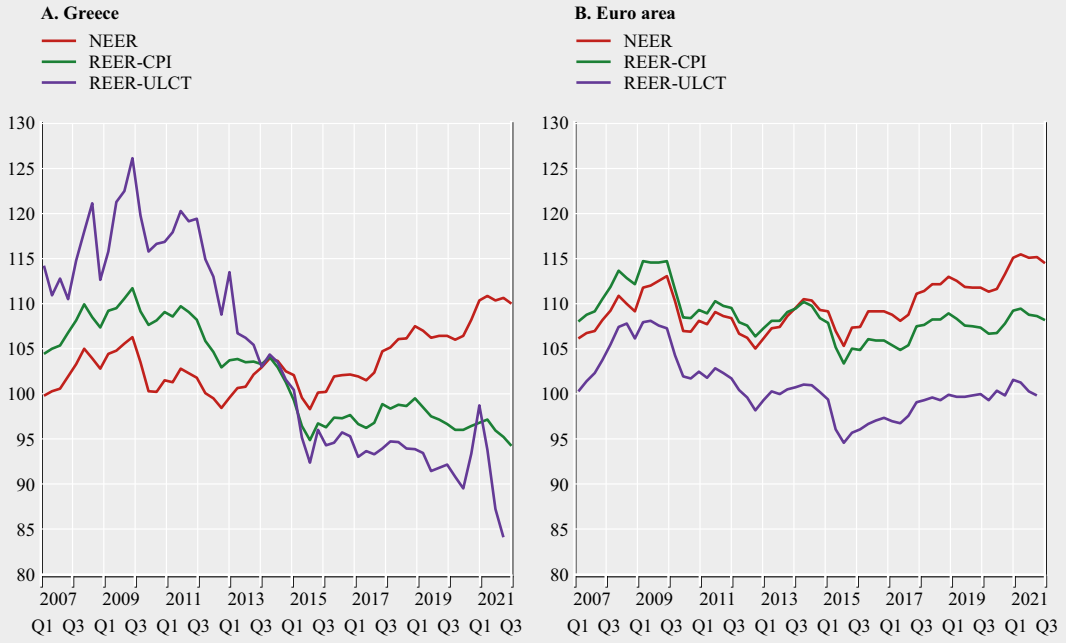
3 INDICES OF PRICE AND NON-PRICE COMPETITIVENESS

3.1 PRICE COMPETITIVENESS INDICATORS: EURO AREA AVERAGE AND GREECE

Price competitiveness is affected by the positive or negative gap between Greek and euro area relative prices, consumer prices and unit labour costs, as well as by the evolution of

Chart 1 Price competitiveness in Greece and the euro area (2007Q1-2021Q3)

(indices 1999Q1 = 100)



Source: ECB, Statistical Data Warehouse (SDW).
Note: NEER: nominal effective exchange rate; REER-CPI: real effective exchange rate deflated by the consumer price index; REER-ULCT: real effective exchange rate deflated by unit labour costs for the total economy.

nominal effective exchange rates. In nominal terms, Greece's price competitiveness worsened to a larger extent compared with the euro area as a whole, limiting competitiveness gains. In addition, the appreciation of the euro affected negatively all euro area countries. However, because of the country's efforts to cope with the economic crisis, price competitiveness in terms of relative prices and unit labour costs improved more for Greece. The effect of the measures to address the socio-economic consequences of the COVID-19 pandemic has not changed the relationship described above (see Chart 1). The positive inflation differential between Greece and euro area countries, which stand as its main trading partners, resulted in competitiveness gains for Greece. Recent developments in price competitiveness in Greece show that price competitiveness based on both the consumer price index (CPI) and unit labour costs has improved. Greece's price competitiveness, whether improving or deteriorating, lies below the euro area average. Factors like energy prices affect differently euro area economies depending on their production model.

3.2 NON-PRICE COMPETITIVENESS INDICATORS: EURO AREA AVERAGE AND GREECE

During the 2007-19 period, the competitiveness of the Greek economy in terms of relative prices and unit labour costs improved because of the policies implemented to address the debt crisis. As a result of this improvement, the country's openness was boosted. However, in terms of structural competitiveness, despite the improvement observed in some indicators, Greece still appears to lag behind the euro area average.

When deciding on which country to invest in, prospective investors, in addition to competitiveness factors in terms of relative prices and

Table 1 Selected structural competitiveness indicators and sources of origin

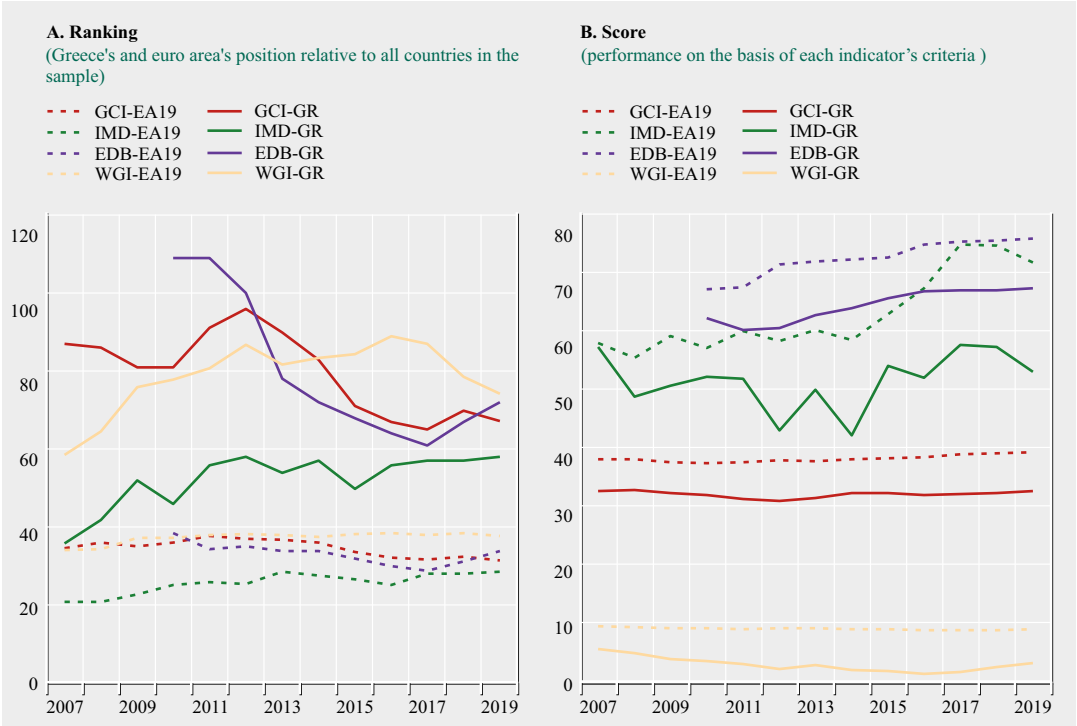
Indicator	Description	Greece's latest developments	Sources
Global Competitiveness Index (WEF-GCI)	Organised in 12 pillars: institutions; infrastructure; ICT adoption; macroeconomic stability; health; skills; product market; labour market; financial system; market size; business dynamism; and innovation capacity.	Although Greece's assessment improved in the latest report for 2019 by 0.5 basis point, it ranked 59th among 141 countries, i.e. two places lower than in the previous report. The best-performing pillars for Greece include health (23rd) and infrastructure (37th), while the most vulnerable ones are still the financial system (115th), due to limited financing to small and medium-sized enterprises (SMEs) and the situation regarding bank stability and non-performing loans, and the labour market (111th), due to high taxation and reduced flexibility in wage formation (25.9.2020).	World Economic Forum (WEF)
World Competitiveness Ranking (IMD-WCR)	Consists of four sub-indices: economic performance; government efficiency; business efficiency; and infrastructure.	Improvement was recorded in two sub-indices, whereas two sub-indices have remained stable, with progress being more pronounced in business efficiency (up to 44th place from 51st) and economic performance (up to 52nd place from 55th). The main challenges for Greece now include: introducing special measures to mitigate the social and economic impact of the COVID-19 pandemic; expanding the national production base by promoting industrial investments; easing access to funding for private enterprises; introducing special programmes for the transformation of local industrial sectors towards industry 4.0; and accelerating the digital transformation of the public sector (17.6.2021).	International Institute for Management Development (IMD)
Ease of Doing Business index (WB-EDB)	Consists of ten pillars: starting a business; dealing with construction permits; getting electricity; registering property; getting credit; protecting minority investors; paying taxes; trading across borders; enforcing contracts; and resolving insolvency.	According to the latest report (2019), Greece's position deteriorated and the country now ranks 79th, from 72nd in 2018. Improvement was recorded in starting a business (WB-SB), protecting minority investors and registering in a business register, while getting credit and enforcing contracts worsened. The procedure of starting a business (11th) and protecting minority investors (37th) improved, as the time to register a company with commercial registry was reduced and the requirement to obtain a tax clearance was removed. Greece ranked lower in 2019 in the "getting credit sub-index" (119th) and in enforcing contracts (146th) (24.10.2019).	World Bank
Worldwide Governance Indicators (WB-WGI)	Comprising six distinct indicators: voice and accountability; political stability and absence of violence/terrorism; government effectiveness; regulatory quality; rule of law; and control of corruption.	There is no composite indicator and Greece improved its average ranking by one position. Specifically, improvement occurred in the subcomponents of Government Effectiveness (65th from 70th), Rule of Law (78th from 83rd) and Control of Corruption (87th from 92nd), while the indicator of Political Stability and Absence of Violence/Terrorism deteriorated (104th from 91st). It is noted that the Worldwide Governance Indicators (WGI) are a research dataset summarising the views on the quality of governance provided by a large number of enterprises, citizen and expert survey respondents in industrial and developing countries. These data are gathered from a number of survey institutes, think tanks, non-governmental organisations, international organisations and private sector firms. The WGI do not reflect the official views of the World Bank, its Executive Directors, or the countries they represent. The WGI are not used by the World Bank Group to allocate resources (25.9.2021).	World Bank
Heritage Index of Economic Freedom	The Index of Economic Freedom evaluates the extent and effectiveness of government activity in 12 areas known to have a significant impact on levels of economic growth and prosperity: property rights; judicial effectiveness; government integrity; tax burden; government spending; fiscal health; business freedom; labour freedom; monetary freedom; trade freedom; investment freedom; and financial freedom.	Greece ranked 100th among 180 countries, up by 6 positions, mainly due to the improvement in government integrity (12.11.2020).	Heritage Foundation
Fraser Economic Freedom	It is a composite index consisting of five major areas in which government policies are assessed: size of government and taxation; legal system and security of property rights; sound money; freedom to trade internationally; business, labour and capital markets regulation.	Greece improved its ranking due to advances in the area of size of government (government investment component), despite a small deterioration in the area of business regulation. The report examines the developments of 2019 (14.9.2021).	Fraser Institute
Corruption Perceptions Index (CPI)	It is a composite index looking at corruption in the public sector: bribery; diversion of public funds; private use of public office; nepotism in public administration; and influence of interest groups on the functioning of the state.	Greece ranked 59th among 180 countries in 2020, higher than in the previous year's report. However, since 2012 it has recorded the highest cumulative progression (by 14 places). Countries performing well in this index invest more in health services and are less likely to breach democratic rules (28.1.2021).	Transparency International
Legatum Prosperity Index	It is a composite index, consisting of twelve pillars: safety and security; personal freedom; governance; social capital; investment environment; enterprise conditions; market access and infrastructure; economic quality; living conditions; health; education; and natural environment.	Greece's position was upgraded by one place (from 42nd to 41st) according to the latest data for 2020.	Legatum Institute

unit labour costs, also consider qualitative factors that could hinder or facilitate the realisation and efficiency of their investment. Such factors include, *inter alia*, the effective functioning of institutions and justice, economic freedom, market flexibility and corporate taxation. Structural competitiveness indicators reflect a country's current situation, as affected by these factors, and the scope for reforms. They also capture both the relative ranking and the absolute score of each country. The relative ranking refers to a country's performance relative to other countries, while the absolute score indicates whether a country's score is moving upwards or downwards. Moreover, as data collection for the compilation of the indicators is mainly based on business surveys, these indicators are affected by changes in the overall macroeconomic conditions. The structural competitiveness of the Greek economy, although still comparatively low vis-à-vis the European and international levels, is improving in some areas, such as reducing business costs in terms of taxation and employer contributions or increasing the efficiency of the public sector. For the purposes of this article, the indicators presented in Table 1 were selected based on the extent and frequency of their use in decision-making, as well as on data availability.

3.3 COMPARISON WITH THE EURO AREA AVERAGE

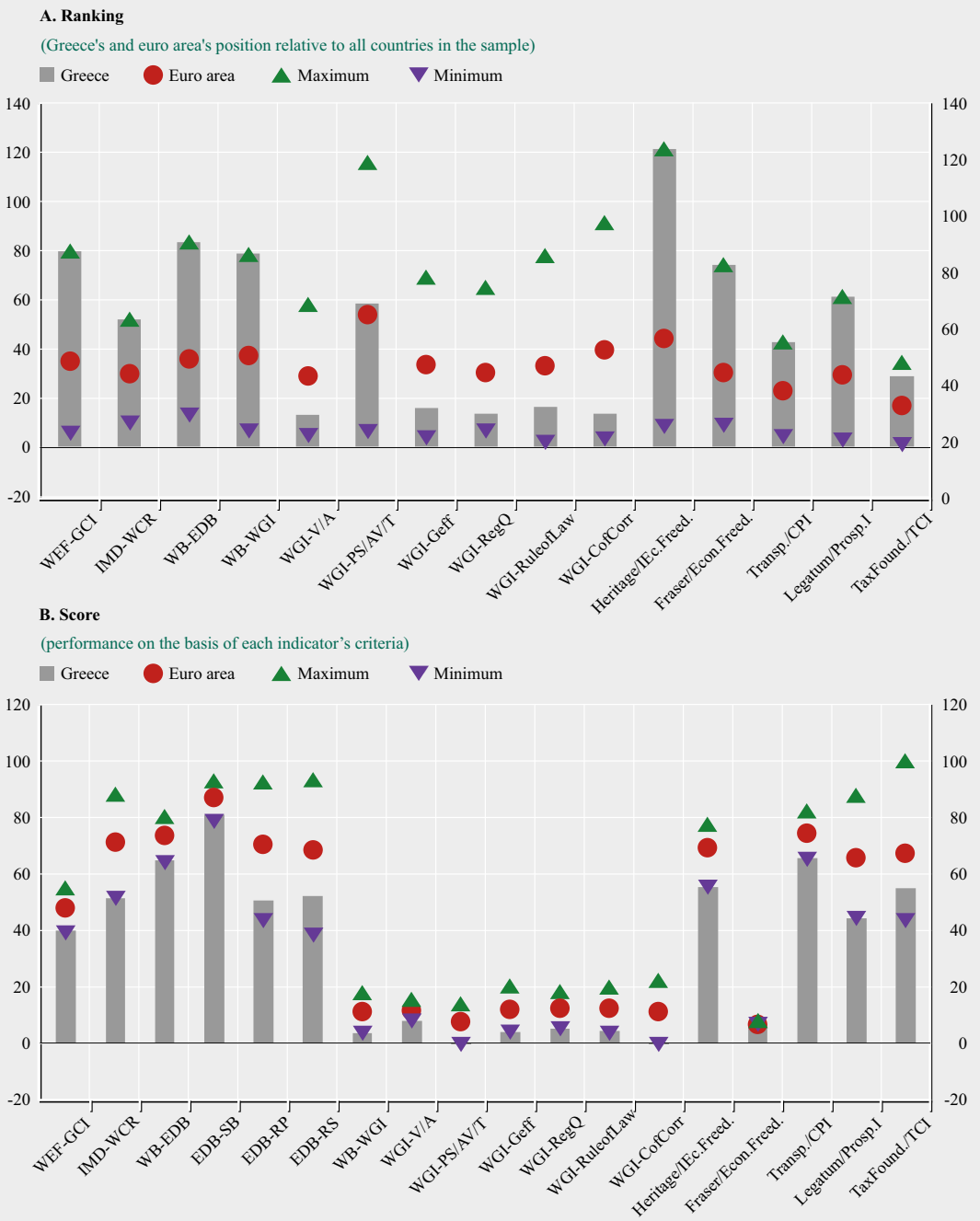
Over time, Greece has lagged behind in key structural competitiveness indicators relative to other euro area countries, with a lower (higher) value corresponding to a better (worse) ranking (see Chart 2A). Indeed, while

Chart 2 Evolution of key structural competitiveness indicators for Greece and the euro area average based on their rankings and scores (2007-2019)



Sources: GCI: World Economic Forum, *Global Competitiveness Report*. IMD: International Institute for Management Development, *IMD World Competitiveness Yearbook*. EDB: World Bank-IFC, *Doing Business*. WGI: World Bank, Worldwide Governance Indicators.
Note: GR: Greece; EA19: euro area - 19 countries.

Chart 3 Greece's position in key structural competitiveness indicators based on rankings and scores relative to the euro area average and the distance from the top- or bottom-ranking country (2007-2019 average)



Sources: WEF-GCI: World Economic Forum, *Global Competitiveness Report*. IMD-WCR: International Institute for Management Development, *IMD World Competitiveness Yearbook*. WB-EDB: World Bank-IFC, *Doing Business*. WB-WGI and all WGIs: World Bank, Worldwide Governance Indicators. Heritage/IEc.Freed.: Heritage Foundation, Index of Economic Freedom. Transp./CPI: Transparency International, Corruption Perceptions Index. Fraser/Econ.Freed.: Fraser Institute, Economic Freedom of the World. TaxFound./TCI: Tax Foundation, International Tax Competitiveness Index. Legatum/Prosp.I: Legatum Institute, Legatum Prosperity Index.
Note: WGI-V/A: voice and accountability, WGI-PS/AV/T: political stability and absence of violence/terrorism, WGI/Geff: government effectiveness, WGI-RegQ: regulatory quality, WGI-RuleofLaw: rule of law, WGI-CofCorr: control of corruption.

the indicators for euro area countries do not fluctuate sharply on average, they deteriorated substantially for Greece during the crisis to recover gradually thereafter. As expected, euro area countries score higher than Greece, with a higher (lower) value pointing to a better (worse) score (see Chart 2B). Chart 3 illustrates Greece's position in key structural competitiveness indicators based on its ranking and score in relation to the euro area average, as well as its distance from the country with the highest or the lowest score. With the exception of governance indicators, Greece's ranking is lower than the euro area average, while in several indicators the country ranks among the last in the euro area, despite the progress made in recent years. The difference between ranking and scoring shows the faster pace of implementation of reforms in other euro area countries.

4 EMPIRICAL ESTIMATION OF EXPORT DEMAND: EURO AREA AND GREECE

The purpose of the empirical analysis that follows is to estimate the main determinants of exports for the euro area and Greece, emphasising the role of institutional quality factors. In order to explore this link, eight panel regressions are estimated (as many as the institutional quality indicators examined). The sensitivity of the results to the choice of a specific index provides a robustness check. In addition, besides revealing common patterns across the 19 member countries regarding export demand and its determinants, the estimates specifically for Greece are reported providing information about the country's position.

4.1 DATA, EMPIRICAL SPECIFICATION AND METHODOLOGY

Our dataset is built using national accounts data (ESA 2010) on the volume of exports (chain-linked volumes: real exports of goods and services at constant 2015 prices) of the 19 euro area member countries. The sample period covers approximately the past decade from 2007 to 2019 and data are of annual frequency. World demand indicators for goods and services for each of the countries are drawn from ECB sources and are used to account for foreign demand (converted from quarterly to annual frequency). Price competitiveness is approximated with the ECB's CPI-deflated real effective exchange rate index for each of the 19 euro area countries.

The impact of institutional quality is measured using the following extensive selection of indicators, which is more informative compared with related recent studies:

- the Global Competitiveness Index (GCI) of the World Economic Forum (WEF), which ranges from 1 to 7;
- the World Competitiveness Ranking (WCR) of the International Institute for Management Development (IMD);
- the World Bank's Ease of Doing Business and Starting a Business indices (WB-EDB, WB-SB);
- the World Bank's Worldwide Governance Indicators (WGI);
- the Index of Economic Freedom of the Heritage Foundation (HERITAGE);
- the Economic Freedom indicator of the Fraser Institute (FRASER);
- the Corruption Perceptions Index (CPI) of Transparency International; and
- the Legatum Prosperity Index by the Legatum Institute[5] (LEGATUM).

The specification adopts the traditional Goldstein and Khan (1985) export demand model, with real exports measured by the export volumes of country i during time t, (x_{it}), as a

5 The definition contained in Table 1 describes the qualitative factors defining prosperity, which include structural competitiveness indicators.

dependent variable explained by foreign demand (y_{it}^{w}), approximating world demand of the countries in the relevant markets,[6] and the corresponding real effective exchange rate ($reer_{it}$). The equation is augmented to include a variable corresponding to each of the above described nine types of institutional quality indicators (I_{it}). Following the literature, a logarithmic functional form is adopted so that the coefficients derived from the estimation are elasticities. Specifically, the augmented export equation takes the following form, with lower case letters corresponding to natural logarithms:

$$x_{it}=a_{it}+\beta_1 y_{it}^{w}+ \beta_2 reer_{it}+\beta_3 I_{it}+\varepsilon_{it} \qquad (1)$$

The estimation method uses panel regressions, combining time series and cross-sectional data, allowing for fixed effects for each country. Using country dummies enables controlling for heterogeneity across countries, thus eliminating common shocks.

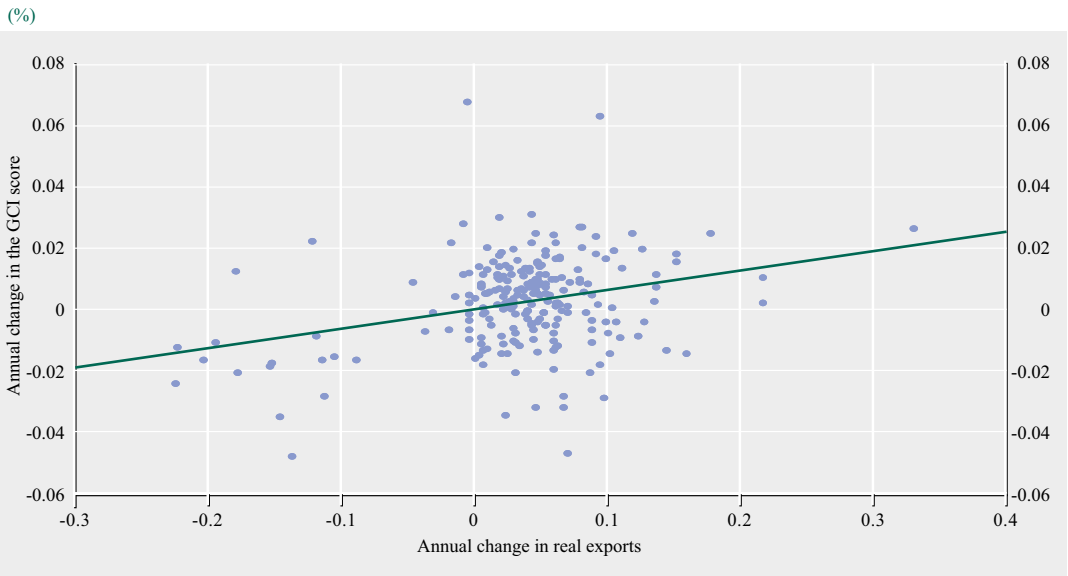
4.2 PANEL ESTIMATION RESULTS

To improve our intuition of the export performance-institutional quality relationship, we first provide a scatter plot (see Chart 4), where the ability of the countries included in the sample to exploit advantages in institutional quality improving export performance can be visualised over the sample period. The WEF's GCI is chosen among the indicators and the chart shows its positive correlation with exports.

Based on the empirical specification, which was determined using the theoretical developments discussed in Section 2 and applying panel OLS to equation (1), we explore the determinants of real exports in the euro area and Greece, paying attention to the institutional factors' effects. Our pooled OLS estimates are presented in Tables 2 and 3. Table 2 uses the indicators measured as scores, while Table 2 uses the same indicators measured as rankings. The Root Mean Square (RMS) at the bottom of the tables measures the efficiency of the empirical estimation. Overall, RMS is rather close to zero, indicating the good performance of the estimated model. The coefficients referring to

6 According to ECB calculations, where world demand is a geometric average of the import volumes of goods and services of a country's major trading partners (the superscript *w* is used to denote world demand).

Chart 4 Institutional efficiency and real exports of euro area countries (2007-2019)



Sources: World Economic Forum, Global Competitiveness Index, and Eurostat.

Table 2 Panel estimation of the export equation adding institutional quality indicators' scores for the euro area and Greece (2007-2019)

(institutional quality indicators calculated as scores)

Dependent variable	Export volume							
	(01)	(02)	(03)	(04)	(05)	(06)	(07)	(08)
Constant	11.260 (20.044)	10.658 (24.41)	11.33 (15.91)	13.651 (21.40)	1.777 (2.956)	9.244 (9.848)	6.074 (5.876)	0.444 (2.321)
y^w_{it}	0.447 (2.381)	1.018 (18.06)	0.824 (6.102)	0.595 (3.866)	0.907 (7.174)	1.230 (17.52)	1.021 (43.14)	0.644 (10.947)
$reer_{it}$	-0.340 (-4.629)	-0.204 (-1.888)	-0.222 (-1.725)	-0.383 (-4.259)	-0.310 (-2.311)	-0.378 (-3.720)	-0.168 (-4.033)	-0.091 (-2.190)
GCI	0.729 [1.451] (3.640, 3.709)	-	-	-	-	-	-	-
WCR	-	0.174 [0.176] (3.131, 2.864)	-	-	-	-	-	-
WGI	-	-	0.167 [0.154] (3.662, 2.991)	-	-	-	-	-
SB	-	-	-	-0.283 [-0.270] (-3.007, -2.777)	-	-	-	-
HERITAGE	-	-	-	-	0.744 [1.035] (2.723, 5.222)	-	-	-
FRASER	-	-	-	-	-	1.139 [1.001] (2.898, 11.039)	-	-
LEGATUM	-	-	-	-	-	-	1.119 [1.284] (4.319, 18.305)	-
CPI	-	-	-	-	-	-	-	0.145 (5.251)
Number of observations	171	130	247	145	188	238	209	247
Trend correction	AR(4) trend squared	AR(5)	AR(5)	AR(5) and linear trend	-	AR(4)	AR(2)	AR(1)
RMS	0.049	0.046	0.072	0.034	0.033	0.046	0.047	0.031

Note: In equation (04) the coefficient of the SB index is negative, which results from the way the indicator is calculated measuring the distance of a country's performance from the best performing country. Country fixed effects were included in the estimation. Time effects were not included. Correction for autocorrelation and trend were used instead, as indicated in each case. T-statistics are in parentheses calculated using heteroscedasticity robust standard errors. The coefficients of the institutional quality indicators regarding Greece are in brackets and are estimated as the coefficient of the interaction term of Greece's fixed effect with the corresponding institutional quality indicator.

the standard variables of foreign demand and price competitiveness have the correct signs (positive and negative, respectively) and are significant, suggesting the importance of these factors in export determination.

Beyond these effects, the high significance of the coefficients of the institutional variables in estimations (1)-(8) and (1)-(7) in Tables 2 and 3, respectively, attests to the importance of institutional factors in explaining export behaviour in the euro area.[7] The same is confirmed for the respective coefficients referring to Greece. More explicitly, the estimates show that beyond the usual factors an improvement in the countries' rankings according to composite institutional quality indicators exerts a favourable effect on exports.

The effect is found to be inelastic for the euro area as a whole, as the value of most of the estimated coefficients is below one, except for two cases (i.e. when LEGATUM and FRASER are considered as scoring indicators). A given percentage improvement, i.e. an average 1%

7 In addition, advancement in institutional quality may have an impact on attracting foreign investors, with additional effects on export performance and economic growth.

Table 3 Panel estimation of the export equation adding institutional quality indicators' rankings for the euro area and Greece (2007-2019)

(institutional quality indicators calculated as rankings)

Dependent variable	Export volume						
	(01)	(02)	(03)	(04)	(05)	(06)	(07)
Constant	12.61 (18.13)	11.81 (29.95)	11.09 (58.31)	11.72 (10.802)	12.69 (16.807)	12.107 (22.99)	12.60 (29.17)
y_{it}^{w}	1.326 (20.046)	1.177 (15.514)	0.883 (14.034)	1.317 (21.09)	1.295 (19.191)	0.770 (8.836)	0.587 (3.840)
$reer_{it}$	-0.591 (-3.953)	-0.293 (-3.301)	-0.163 (-8.253)	-0.476 (-2.176)	-0.573 (-3.658)	-0.345 (-3.512)	-0.385 (-4.942)
GCI	-0.058 [-0.183] (-2.104, -2.384)	-	-	-	-	-	-
WCR	-	-0.071 [-0.438] (-2.805, 2.788)	-	-	-	-	-
WGI	-	-	-0.046 [-0.439] (-2.286, -8.178)	-	-	-	-
EDB	-	-	-	0.085 [0.103] (2.815, 7.389)	-	-	-
HERITAGE	-	-	-	-	-0.088 [-0.330] (-2.854, -2.941)	-	-
FRASER	-	-	-	-	-	-0.050 [-0.266] (-3.157, -2.307)	-
LEGATUM	-	-	-	-	-	-	-0.064 [-0.275] (-1.918, -2.331)
Number of observations	171	218	209	144	133	190	171
Trend correction	AR(4)	AR(4)	AR(2) and linear trend	AR(1) and linear trend	AR(2)	AR(2) and linear trend squared	AR(4) and linear trend squared
RMS	0.056	0.046	0.044	0.065	0.051	0.046	0.049

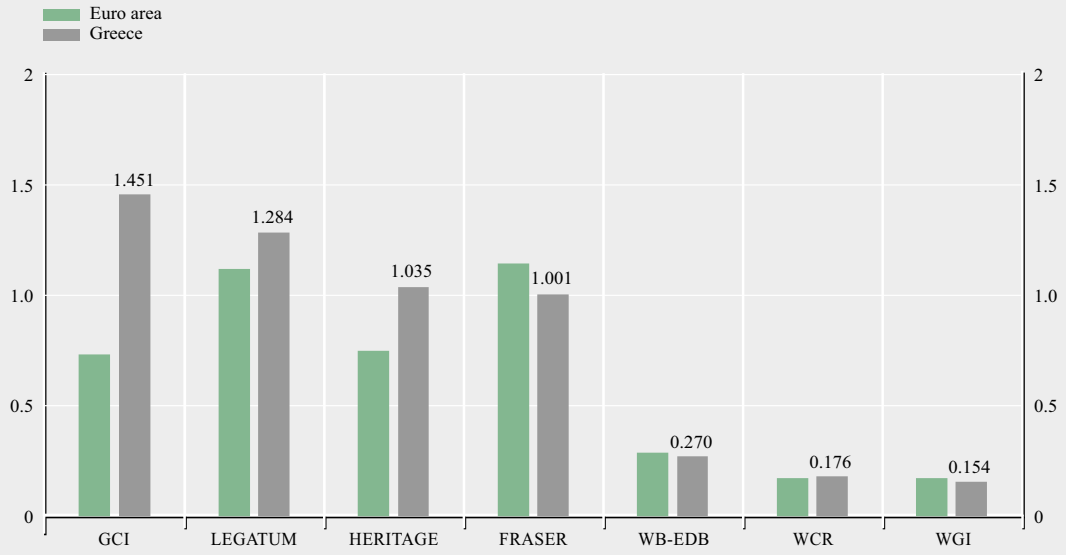
Note: In equation (04) the coefficient of the EDB index is positive, which results from the way the indicator is calculated measuring the distance of a country's performance from the best performing country. Country fixed effects were included in the estimation. Time effects were not included. Correction for autocorrelation and trend were used instead, as indicated in each case. T-statistics are in parentheses calculated using heteroscedasticity robust standard errors. The coefficients of the institutional quality indicators regarding Greece are in brackets and are estimated as the coefficient of the interaction term of Greece's fixed effect with the corresponding institutional quality indicator.

improvement, in the scoring or ranking indicators examined for all 19 euro area countries over the reviewed period leads, with a few exceptions, to less percentage strengthening of exports, i.e. to a 0.6% increase in exports when the indicator represents scores and to a 0.07% increase in exports when the indicator denotes rankings. With regard to Greece, the indicators' effect as score is above unity in four cases (GCI, LEGATUM, HERITAGE and FRASER) and the indicators' effect as ranking is below unity in all cases. Specifically, over the sample period and across the eight indicators, the average impact on exports from a 1% improvement in institutional quality is almost 1% when scores are used and 0.4% when rankings are used.[8] The above estimated greater sensitivity of Greek exports than that of euro area exports, on average, can be interpreted by improvements in Greece's weaker position during that period, compared with most euro area countries, regarding the attainment of good levels of institutional quality that intensified towards the past few years of recovery. Turning to these indicators, most of the euro area countries had already achieved

8 This entails that improvements in the factors measured by the structural competitiveness indicators, thereby reflecting improvements in the business environment and the functioning of institutions, are important for Greece's openness and trade performance.

Chart 5 Effect of selected structural competitiveness indicators' scores on the export volumes of the euro area and Greece

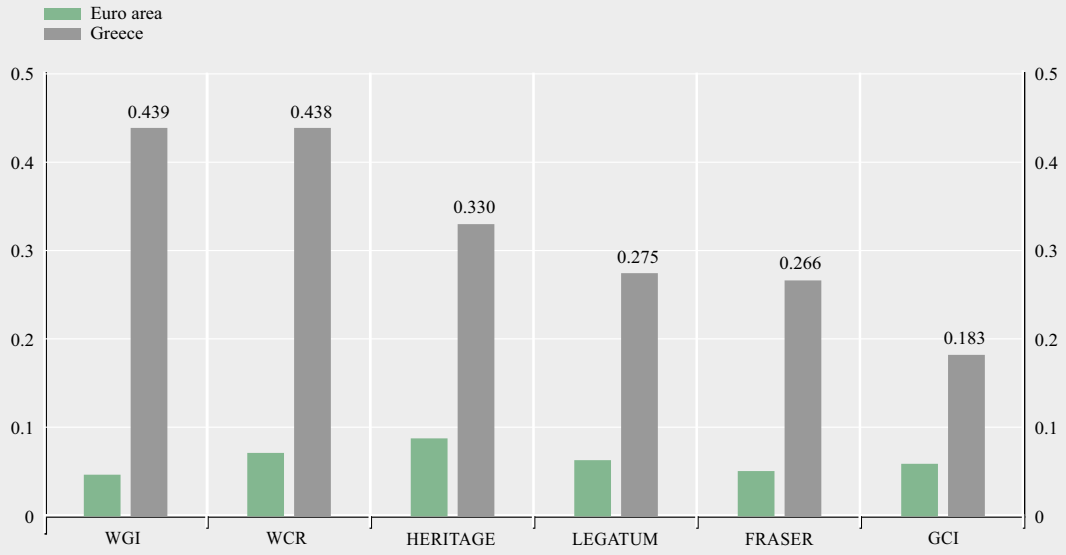
(separate panel regressions)



Sources: GCI: World Economic Forum, *Global Competitiveness Report*. LEGATUM: Legatum Institute, Legatum Prosperity Index. HERITAGE: Heritage Foundation, Index of Economic Freedom. FRASER: Fraser Institute, Economic Freedom of the World. WB-EDB: World Bank-IFC, *Doing Business*. WCR: International Institute for Management Development (IMD), *IMD World Competitiveness Yearbook*. WGI: World Bank, Worldwide Governance Indicators.

Chart 6 Effect of selected structural competitiveness indicators' rankings on the export volumes of the euro area and Greece (2007-2019)

(separate panel regressions)



Sources: WGI: World Bank, Worldwide Governance Indicators. WCR: International Institute for Management Development (IMD), *IMD World Competitiveness Yearbook*. HERITAGE: Heritage Foundation, Index of Economic Freedom. LEGATUM: Legatum Institute, Legatum Prosperity Index. FRASER: Fraser Institute, Economic Freedom of the World. GCI: World Economic Forum, *Global Competitiveness Report*.

higher levels of performance following a more stable path. This also explains the finding of smaller coefficients of the ranking indicators referring to the euro area, compared with those referring to Greece. Generally, according to the above results, the countries in the sample exploit improvements in structural competitiveness to promote growth and openness. This is more pronounced in the case of Greece, confirming the positive contribution of reforms to export performance and growth.

Chart 5 depicts and classifies the eight estimated coefficients of structural competitiveness indicators based on scores and Chart 6 illustrates the corresponding indicators based on rankings for the euro area and for Greece.[9] The separate estimation using each of the indicators identifies, when scores are used, the elements of competitiveness included in the GCI, LEGATUM, HERITAGE and FRASER indicators as the most important in export performance for both the euro area and Greece in particular.

The effects of the indicators based on rankings regarding Greece are of similar size, but significantly higher than those that correspond to the euro area. This result mirrors differences in the speed of implementation of reforms between euro area countries and Greece. Furthermore, the importance of these effects is consistent with improvements in Greece's rankings that are observed over the recent years of the sample. For example, during 2018-19 the GCI records improvements in the pillars regarding health and infrastructure, the composite LEGATUM index is upgraded by one place, while the HERITAGE index is up by six positions. Improvements in WCR and WGI are also recorded in 2020, a year that is not included in our sample.

5 CONCLUSIONS – POLICY RECOMMENDATIONS

This paper, after describing the evolution of selected institutional indicators of structural competitiveness and comparing Greece's average development with that of the euro area, investigates their role in determining exports for the euro area and Greece. The structural competitiveness of the Greek economy, although still low, has improved. However, the pace of implementation of reforms falls short of that of other euro area countries, so that any improvement does not allow Greece to move up vis-à-vis its competitors. During the crisis, Greece's comparative position declined in many international rankings and showed some improvement in the following years. Many of the difficulties that hamper business and investment decisions remain after the crisis, mainly concerning taxation, non-wage labour costs, energy costs, financing costs and the institutional framework.

A review of the recent literature stresses the importance of institutional quality indicators and their effect on export performance, along with alternative approaches to defining structural competitiveness. After estimating a traditional export demand function, augmented to include the selected institutional quality indicators, we describe the results that support the hypothesis of the significant role of non-price competitiveness and comment on their statistical significance. It is shown that exports respond to the key composite structural competitiveness indicators for the euro area as a whole. For Greece in particular, the corresponding export dependency is higher. The recent improvement in the country's competitive position is linked to and positively affects exports, leading to increased openness of the economy.

The relevant policy recommendation refers to the proper use of the available EU funds through Next Generation EU, which is an important opportunity that should not be left

9 When using scores, the coefficient of the indicator is positive (higher score denotes more exports), while, when using rankings, the coefficient is negative (farther from the top/lower ranking implies less exports). Exceptions include the indicators of ease of doing business (WB-EDB, used in Table 3) and starting a business (WB-SB, used in Table 2), where the score is defined as the distance from the best score. Thus, a higher score value shows a deterioration in the quality of the entrepreneurial environment. In this case, the coefficient of the score (ranking) index is expected to be negative (positive) in contrast with the coefficients of the rest of the institutional quality indicators used in this study.

untapped. The use of these funds, as announced and approved by the European Commission, will be directed to the implementation of reforms. These reforms are closely related to non-price competitiveness and, to a smaller extent, also possibly to a price competitiveness improvement, while their implementation will lead to increasing Greece's score in the evaluation of structural competitiveness indicators. The pace of reforms already under way should be accelerated and this will be mirrored in the country's structural competitiveness indicators and expressed as better scores and higher rankings converging towards the performance of the other euro area countries. In addition, competitiveness depends on participation in collaborative production networks and global value chains (GVC). This requires that firms and exporters in particular focus on activities where they have comparative advantage, each specialising in what they do best. Reform efforts targeting improvements in competitiveness and the quality of institutions will lead to the complementarity of firms across borders and promote GVC participation of institutionally sensitive firms, thereby resulting in export promotion, higher export performance and import substitution, ultimately supporting investment and economic growth in the country.

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