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GREEK EXPORT PERFORMANCE: A CONSTANT MARKET SHARE ANALYSIS

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ABSTRACT

Following the gains of Greek non-fuel goods export market shares in the period 2005-2008, a continuous decline was recorded in the period 2009-2015, with their recovery starting in 2016. In this paper, we decompose the changes in the Greek export market shares during the pre- and post-crisis periods by employing the constant market share analysis framework. Our results indicate that the pre-crisis market share gains can be attributed to the strong positive effect stemming from the geographical distribution of exports, fuelled by the strong trade growth in Greece's main export markets (i.e. the euro area and Southeast Europe). The effect of the product composition of exports was almost neutral, while the competitiveness effect eroded more than half of the gains in the structure effect. In 2009-2018, the Greek export market share posted a decline that was mainly driven by the adverse competitiveness effect. The analysis of the last period (2016-2018) indicates a number of important findings. The adverse competitiveness effect is diminishing; the structure effect turns from negative in 2009-2012 to positive in 2016-2018, driven mainly by the geographical distribution effect and secondarily by the product composition effect. However, despite the recent recovery, the market shares have not yet reached their 2008 levels.

Keywords: constant market share, Greek exports, export performance, competitiveness effect, structure effect

JEL classification: F14, L60, O52, C60

ΕΞΑΓΩΓΙΚΗ ΕΠΙΔΟΣΗ ΤΗΣ ΕΛΛΑΔΟΣ: ΜΙΑ ΑΝΑΛΥΣΗ ΣΤΑΘΕΡΩΝ ΜΕΡΙΔΙΩΝ ΑΓΟΡΑΣ ΤΩΝ ΕΞΑΓΩΓΩΝ ΑΓΑΘΩΝ

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ΠΕΡΙΛΗΨΗ

Μετά την άνοδο των μεριδίων αγοράς των ελληνικών εξαγωγών αγαθών (χωρίς καύσιμα) κατά την περίοδο 2005-2008, παρατηρήθηκε συνεχής υποχώρησή τους την περίοδο 2009-2015, ενώ η ανάκαμψή τους ξεκίνησε το 2016. Στην παρούσα εργασία αναλύουμε τις μεταβολές στα μερίδια αγοράς των ελληνικών εξαγωγών κατά τις περιόδους πριν και μετά την κρίση, χρησιμοποιώντας τη μεθοδολογία της "ανάλυσης σταθερών μεριδίων αγοράς". Η ανάλυσή μας δείχνει ότι η άνοδος των μεριδίων αγοράς πριν από την κρίση μπορεί να αποδοθεί στο έντονο θετικό αποτέλεσμα που προκύπτει από τη γεωγραφική κατανομή των εξαγωγών, το οποίο τροφοδοτείται από τη μεγάλη αύξηση των εμπορικών συναλλαγών στις κύριες εξαγωγικές αγορές της Ελλάδος (δηλ. τη ζώνη του ευρώ και τη Νοτιοανατολική Ευρώπη). Το αποτέλεσμα της σύνθεσης των εξαγωγών κατά προϊόν ήταν σχεδόν ουδέτερο, ενώ το αποτέλεσμα ανταγωνιστικότητας αντιστάθμισε περισσότερο από το ήμισυ του θετικού αποτελέσματος σύνθεσης των εξαγωγών. Κατά την περίοδο 2009-2018, το μερίδιο αγοράς των ελληνικών εξαγωγών σημείωσε πτώση, που οφειλόταν κυρίως στο αρνητικό αποτέλεσμα ανταγωνιστικότητας. Από την ανάλυση της τελευταίας περιόδου (2016-2018) προκύπτουν ορισμένα σημαντικά συμπεράσματα. Το αρνητικό αποτέλεσμα ανταγωνιστικότητας μειώνεται, ενώ το αποτέλεσμα σύνθεσης μετατρέπεται από αρνητικό το 2009-2012 σε θετικό το 2016-2018, κυρίως λόγω της γεωγραφικής κατανομής και δευτερευόντως λόγω της κατά προϊόν σύνθεσης. Ωστόσο, παρά την πρόσφατη ανάκαμψη, τα μερίδια αγοράς δεν έχουν ακόμη φθάσει στα επίπεδα του 2008.

GREEK EXPORT PERFORMANCE: A CONSTANT MARKET SHARE ANALYSIS[1]

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I INTRODUCTION

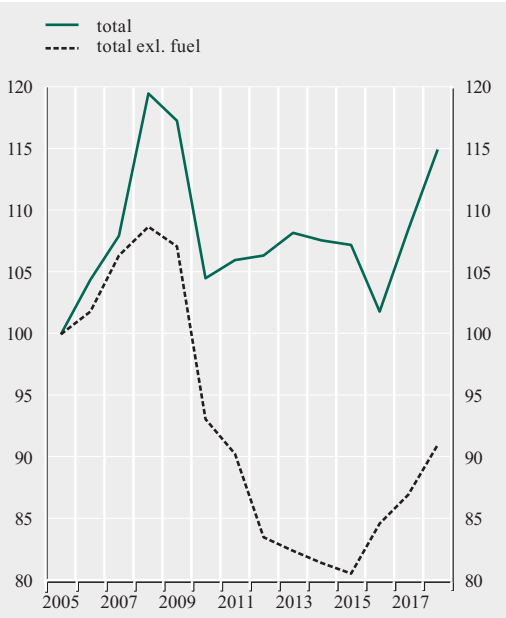
The positive developments in the external sector of the Greek economy, which materialised despite the significant contraction of economic activity that followed the outbreak of the crisis, are largely the result of the exceptional performance of Greek exports of goods, which have increased by more than 50% at constant prices since 2009 (from 7.5% of GDP in 2009 to 17.5% of GDP in 2018). This process reflects the dynamic shift of Greek firms towards foreign markets, as a result of the collapse of domestic demand, and was primarily based on both the recovery of global demand and the improvement of cost and price competitiveness through the gradual recouping of the losses of the previous decade (2000-2010). This paper evaluates the export performance of the Greek economy in comparison with the performance of the rest of the world, by analysing the evolution of Greece's export market shares. Changes in a country's market shares depend on its competitiveness as well as on the sectoral and geographical structure of its exports. In order to assess the impact of these factors on Greek exports, the commonly used "Constant Market Share Analysis" (CMSA) is conducted for the period 2005-2018, with particular emphasis on the period after the global economic crisis of 2008, which mostly coincides with the years of the Greek economic crisis. The analysis focuses on exports of goods, chiefly due to data availability issues. Besides, the adjustment of the external sector relied mainly on the favourable developments in goods exports. The analysis also excludes fuel exports, in order to avoid a distortion of the results for the rest of the exporting sectors as a consequence of the extensive adjustment of the market share of fuel exports, which represent almost one-third of total exports of goods. An additional reason for this exclusion is the fact that exports of fuels are strongly influenced by the volatility of international oil prices.

Underlying the CMSA approach is the idea that the product and destination structure of exports can affect the position of a country in foreign markets. If the country specialises in products and markets where demand is growing faster in comparison with other markets, then its exports will outgrow world exports and thus its aggregate market share will increase, even if individual product and destination market shares remain constant. This is defined as the "structure effect". The difference between the actual change in market shares and the structure effect is the "competitiveness effect", which is a "pure" market effect and incorporates the impact of all factors, besides structure, that determine the market share of the exporting country. This methodology enables us to evaluate the contribution of key products and destinations to the evolution of export performance, as well as the impact of other factors that affect market shares, such as price and non-price competitiveness. The CMSA was initially used by Tyszynski (1951). Since then, several refinements have taken place, aimed at addressing its limitations. The CMSA method used in this analysis follows the

1 The authors would like to thank C. Papazoglou and T. Kosma for their useful comments and invaluable insights into the issues discussed in this article. The views expressed are those of the authors and do not necessarily reflect those of the Bank of Greece. The authors are responsible for any errors or omissions.

Chart 1 Greek export market shares (2005-2018)

(Greek exports as % of world exports, current prices, 2005=100)



Source: United Nations, COMTRADE database; authors' own calculations.

refined formulation suggested by Nyssens and Poullet (1990), according to which the change in the market share is approximated by the difference between a country's export growth and the export growth of the "world". This methodology has been employed in the analysis of the market share evolution in a number of countries/areas such as the euro area, Portugal, Spain, Ireland, and Canada (see Task Force of the MPC of the ESCB 2005; Amador and Cabral 2008; Jiménez and Martin 2010; Pina 2011; de Munnik, Jacob and Sze 2012; Pandiella 2015).

The contribution of this study is twofold. First, it applies a refined CMSA methodology for the period before and after the sovereign debt crisis; second, it investigates the key drivers of the Greek export market shares in major geographical destinations and major exporting sectors, attempting to point out any idiosyncrasies of these markets. Specifically, the CMSA methodology is applied separately to (a) four destination markets, i.e. the euro area, South-east Europe (SEE), advanced economies outside the euro area, and the rest of the world; and (b) four product sectors, namely food, beverages and tobacco (including all processed and unprocessed products); chemicals and plastics (including pharmaceuticals); machinery and transportation equipment; and other manufactured products (which includes all manufactured products not classified in the other three sectors).

The paper is organised as follows: the next section provides an overview of recent developments in the Greek and world export markets, while Section 3 contains a literature review and a presentation of the methodology used. The description of the data follows in Section 4. The analysis of the CMSA results is presented in Section 5. Finally, Section 6 summarises the conclusions and policy implications of the study.

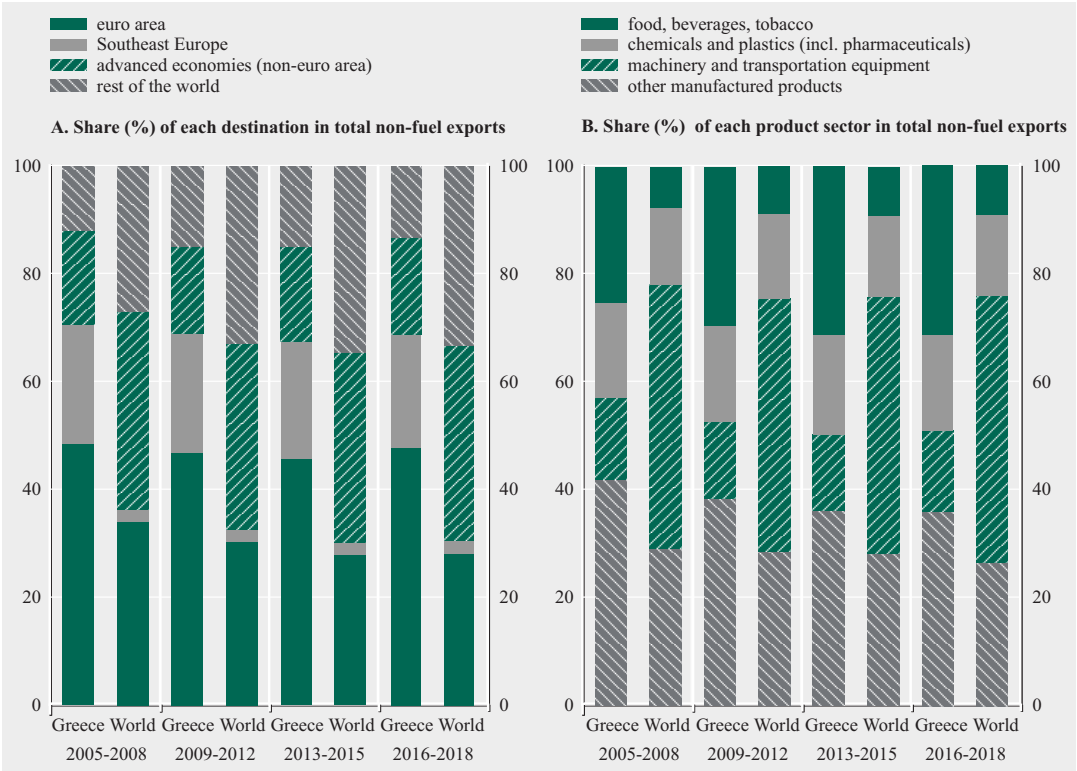
2 DEVELOPMENTS IN THE GREEK EXPORT MARKET SHARES AND THE STRUCTURE OF GREEK AND WORLD EXPORTS BY PRODUCT AND GEOGRAPHICAL DESTINATION

The market share of Greek exports showed a considerable improvement until 2008 (see Chart 1), despite the continued losses of cost/price competitiveness since 2000.[2] After an initial decline due to the outbreak of the 2008 crisis, it followed an upward trend, which, with the exception of 2015-2016, continued through 2018. However, this picture is significantly affected by the increase in the market share of fuel exports, which kept rising during the period under consideration and had more than tripled by the end of 2018. This can be attributed only partially to price increases, given that at the same time fuel exports, at constant prices, increased at an average annual rate of 16% and their share in total Greek

2 According to the Harmonised Competitiveness Indicators published by the ECB (Statistical Data Warehouse), Greece's competitiveness in terms of cost and prices declined by 29% and 19%, respectively, between 2000 and 2009. However, a significant recovery took place in 2010-2015, with cost and price competitiveness improving by 24% and 13%, respectively.

Chart 2 Breakdown of Greek exports by geographical destination and product sector (excluding fuel)

(current prices)



Source: United Nations, COMTRADE database; authors' own calculations.

exports rose from 11% in 2005 to 35% in 2018. This exceptional export performance of the fuel sector is to a great extent the result of the significant growth of investment in the sector.[3] The market share of non-fuel goods increased during the period 2005-2008 at a slower pace than the aggregate, and declined throughout the period 2009-2015, before recovering from 2016 onwards. After 2009, the growth of Greek non-fuel exports was weaker than that of world exports and, as a result, Greek export market shares declined. Their recovery since 2016 is encouraging, although they have not returned as yet to their 2008 level.

The position of Greek exports in foreign markets depends largely on their composition by product and geographical destination, which is significantly different from that of world exports (see Chart 2). The analysis of exports excluding fuels shows that the share of other manufactured products, mostly low-to-medium tech products, in Greek exports is the largest and declined significantly during the period 2005-2018, mainly in favour of the food, beverages and tobacco sector.[4] Both sectors account for higher percentages of Greek exports compared with the structure of world exports, which overall is more stable and heavily reliant (by close to 50%) on exports of machinery and transportation equipment. At the same time, no major changes in the geographical distribution of Greek exports were observed during the period 2005-2018, with the member countries of the euro area absorbing 48% of Greek exports. World exports depend

3 For a discussion of the factors that determine and contribute to export activity for refined oil products, see Mpardaka and Papazoglou (2019).
4 See also Bank of Greece (2019).

less than Greek exports on the euro area market, as the other advanced economies absorb a larger share of world exports. Moreover, the SEE market represents a relatively minor destination for world exports, while it is a considerably more important market for Greek products.

3 THE CONSTANT MARKET SHARE ANALYSIS (CMSA) METHODOLOGY AND PREVIOUS RESEARCH ON GREEK EXPORTS

The CMSA is essentially an arithmetic breakdown of the change in the export market share, which —according to the formulation employed in our analysis— is approximated by the difference between the rate of change in Greek exports and the rate of change in world exports between any two periods t-1 and t. This is called **the total effect (TE)**:

$$g - g^* = \sum_i \sum_j \theta_{ij}\, g_{ij} - \sum_i \sum_j \theta^*_{ij} g^*_{ij} \qquad (1)$$

where:

$g = \frac{x_t - x_{t-1}}{x_{t-1}}$ $(g^* = \frac{x^*_t - x^*_{i-1}}{x^*_{t-1}})$ is the rate of change in total Greek (world) exports between t-1 and t,

g_{ij} (g^*_{ij}) is the rate of change in Greek (world) exports of product i to destination j between t-1 and t, and

$\theta_{ij} = \frac{x_{ij\,t-1}}{x_{t-1}}$ $(\theta^*_{ij} = \frac{x^*_{ijt-1}}{x^*_{t-1}})$ is the share of exports of product i to destination j in total Greek (world) exports in t-1.

A positive (negative) sign of the difference between the two rates of change denotes an increase (decrease) in the market share of Greek exports.

Equation (1) is finally written as

$$g - g^* = \left[\sum_i \sum_j (\theta_{ij} - \theta^*_{ij})\, g^*_{ij}\right] + \left[\sum_i \sum_j \theta_{ij}\, (g_{ij} - g^*_{ij})\right] \qquad (2)$$

where the first term in brackets is the structure effect and the second term is the competitiveness or "pure" market effect.

The structure effect (SE) expresses the growth differential between Greek and world exports as the weighted average of export growth rates in individual product/destination markets. The weights are the differences in the shares of individual products/destinations in total Greek and world exports $(\theta_{ij} - \theta^*_{ij})$, reflecting the country's specialisation relative to the rest of the world. This term incorporates the comparative advantage of the country. A positive (negative) sign means that the country specialises in products and destinations where demand is growing faster (slower) than world demand, leading to gains (losses) in market share, even when individual market shares are constant.

The structure effect can be further decomposed into three terms that account separately for the effects of (i) the product composition and (ii) the geographical distribution of exports, as well as (iii) the interaction between these two, in the following way:

$$\sum_i (\theta_i - \theta^*_i) g^*_i + \sum_j (\theta_j - \theta^*_j)\, g^*_j + \sum_i \sum_j \left[(\theta_{ij} - \theta^*_{ij}) - (\theta_i - \theta^*_i)\frac{\theta^*_{ij}}{\theta^*_i} - (\theta_j - \theta^*_j)\frac{\theta^*_{ij}}{\theta^*_j}\right] g^*_{ij}$$

where

$\theta_i = \sum_j \theta_{ij}$ $\left(\theta^*_i = \sum_j \theta^*_{ij}\right)$ is the share of product i in total Greek (world) exports in period t-1,

$\theta_j = \sum_i \theta_{ij}$ $(\theta^*_j = \sum_i \theta^*_{ij})$ is the share of destination j in total Greek (world) exports in period t-1 and

$g^*_i = \frac{\sum_j \theta^*_{ij}\, g^*_{ij}}{\theta^*_i}$ $(g^*_j = \frac{\sum_i \theta^*_{ij}\, g^*_{ij}}{\theta^*_j})$ is the rate of change in world exports of product i (to destination j) between t-1 and t.

In turn, the three terms of the sum are explained as follows:

(i) The product composition effect (PCE). This reflects the impact of the diversification of Greek exports by product relative to world exports. A positive (negative) sign of this term

means that Greek exports include products for which demand is rising faster (slower) than world demand.

(ii) The geographical distribution effect (GDE). This reflects the effect of the diversification of Greek exports by geographical destination relative to world exports. A positive (negative) sign of this term means that Greek exports are directed to markets where demand is growing faster (slower) than in the world market.

(iii) The interaction effect (IE). This is the effect of the interaction of product and geographical structure and reflects the fact that the demand conditions that an exported product faces differ across destinations. The greater the interdependence between the product and the destination, the larger in absolute value is the IE.

The competitiveness or "pure" market effect (CE) is a residual that measures the difference between the actual change in the market share and the change measured by the structure effect. It reflects the impact of the changes in the individual product/destination market shares as reflected in the difference of export growth rates $(g_{ij} - g^{*}_{ij})$, weighted by the respective shares in total exports (θ_{ij}), which in turn are assumed to be constant and equal to their level observed at the beginning of the period. This term captures the impact of factors that, given a country's specialisation in products and geographical areas, determine both cost/price competitiveness and structural competitiveness. A positive (negative) sign on this term means that the country gains (loses) market share.

The formulation employed in this study addresses a number of limitations that have been identified in the traditional CMSA methodology.[5] In more detail:

1. *Index number problem:* In the traditional CMSA, the weights (i.e. market shares) of the initial period were used, thereby overlooking the fact that the export structure of a country changes continuously. In our analysis, this is addressed by calculating annual changes and then aggregating the changes over a period, as the structure of exports is not expected to change considerably from one year to another. This approach was one of the solutions suggested by Milana (1988).

2. *Asymmetric calculation of product and geographical effects:* In the traditional CMSA, the calculation sequence of the two effects could impact the outcome, as the interaction term was included in either the one or the other. In our analysis, the interaction effect is calculated explicitly; thus a product, a geographical and an interaction effect are calculated.

Despite these refinements, a couple of limitations still remain. First, the level of data disaggregation (product and area) can affect the results of the analysis.[6] A finer disaggregation of the data tends to increase the structure effect and decrease the competitiveness effect. The level of disaggregation is at the discretion of the researcher and is usually based on data availability. In our analysis, the selection of the geographical areas along with a two-digit level product disaggregation allows us to strike a fine balance between data availability and data granularity.[7] Second, the analysis is performed in export values rather than volumes. This is dictated by the lack of export volume data at the required level of disaggregation. With a view to minimising any further price effects, energy products, which are generally characterised by volatile prices, were excluded from our analysis.

To the best of our knowledge, the most recent CMSA on Greek exports was conducted by Athanasoglou, Backinezos and Georgiou

5 For a discussion of the CMSA methodology and its shortcomings, see for example Richardson (1971a, b) and Milana (1988).
6 See Richardson (1971b).
7 The analysis at the two-digit level was employed by Jiménez and Martin (2010), de Munnik, Jacob and Sze (2012) and Pandiella (2015). The Task Force of the MPC of the ESCB (2005) uses the three-digit level, while Amador and Cabral (2008) a four-digit level product disaggregation.

(2010). The authors employed the traditional CMSA methodology[8] extended by refining the calculation of the product and the geographical effect, so as to minimise the asymmetric element in the calculation of such effects. Their analysis was performed for the period 1996-2006 and indicated that —overall— the geographical effect had a significant positive impact, while the competitiveness effect was of a smaller magnitude and the commodity composition effect was negative and declining in absolute value.[9] As our analysis covers the period from 2005 onwards and employs a further refined CMSA methodology, it is not directly comparable. However, their assessment on the significant role of the geographical effect in the pre-crisis period is confirmed by our analysis as well.[10]

A Task Force of the MPC of the ESCB (2005) performed a CMS analysis on developments in the market share of the euro area as a whole (i.e. extra-euro area trade) for the period 1985-2001, using the same methodology as in our study. They concluded that the euro area market share loss could be attributed to an underspecialisation in fast-growing markets such as those in Asia (especially in the 1990s and after the Asian crisis in 1998) and to a lesser extent to the United States and Japan. The former result was partly attributed to the intra-area trade in Asia (assisted also by the proximity of the Asian countries) and associated with outsourcing to China. The product effect turned out to be —in general— neutral. For the period 1985-2001, the competitiveness effect accounted for one-third of the loss, while the structure effect for the remaining two-thirds.

Jiménez and Martin (2010) used the CMSA framework for the euro area and its member countries over the period 1994-2007. As far as Greece is concerned, its market share declined throughout this period by approximately 0.6% per annum, due to both the competitiveness effect (-0.3% p.a.) and the structure effect (-0.3% p.a.), despite the fact that the geographical distribution effect was positive (0.5% p.a.). In the subperiod 2001-2007, the Greek export market share was increasing by 4.4% p.a., as all effects were positive; the greatest effect was the competitiveness effect (2.2% p.a.), while the geographical distribution effect was 1.5% p.a. In the case of the geographical distribution effect, the euro area, the rest of the EU and the rest of Europe had a positive contribution (slightly higher than 4%), while other destinations (e.g. the United States, China, the rest of the world) had a negative contribution of approximately 3%. Although our analysis started from 2005, the importance of the geographical effect in the pre-crisis period is confirmed in our analysis as well. In addition, our results are similar as regards the contribution of the destination markets to the geographical effect (see Table 2). However, our analysis indicates that the competitiveness effect in the pre-crisis period (2005-2008) is negative. This divergence could stem from the positive effects of non-price competitiveness in the early years of Greece's euro area participation, which is captured by Jiménez and Martin (2010) as their analysis covers the period 2001-2007.

Amador and Cabral (2008), using the same methodology as in this study, analysed the evolution of the export market share of Portugal in comparison with the respective developments for Spain, Ireland, Greece and Italy. They found that the Greek market share increased by 55.7% in the period 1968-2006 (the respective increase for Portugal was 14.5%). Additionally, the structure effect is slightly positive for Greece, as it benefits from a small positive impact of the geographical distribution of exports. Specifically, the geographical structure

8 They decomposed the growth of Greek exports into four effects: world growth; commodity competition; geographical structure; and competitiveness effect.

9 The commodity disaggregation was at the four-digit level and commodities were further classified according to their technological intensity. Energy products were excluded.

10 An earlier analysis was performed by the IMF (2007) and focused on Greek export changes for the period 1992-2005. The study found that, for the subperiod 2000-2005, the increase in Greek exports (9.8% p.a.) is attributed to the world trade effect (i.e. rising world trade) and —to a lesser extent— to the positive market distribution effect stemming from the rapidly growing SEE economies. However, marginally negative effects were calculated for commodity composition (tilted towards goods for which world demand has been growing at below-average rates) and for competitiveness (i.e. residual effect).

effect is favourable, due to the positive contribution from Greece's non-specialisation in the US market (a market growing below world average in the period examined) and from its higher specialisation in the Bulgarian and Romanian markets. The product structure effect though was unfavourable.

4 DATA

The analysis is based on data from the United Nations database COMTRADE and uses bilateral trade data on merchandise exports of goods (in US dollars) for the period 2005-2018. Greece's market shares are calculated in relation to a group of 60 countries, which is defined as the "world" and includes the country's major trading partners (see the Appendix).

However, exports from Greece and the "world" are also directed to countries other than the group of partners. Included in this analysis are only those countries for which data are available for the whole period, accounting for about 90% of Greek exports and around 85% of exports of the "world". It should be noted that the euro area data include total exports of each member country, both intra- and extra-euro area. As a further enhancement, we have excluded the value of Greek exports from the "world" aggregate. This improvement is expected to have a small impact in the case of Greece; however, for large countries this impact could be significant. Also, 59 products are used from the two-digit categories of the Standard Classification of International Trade (SITC Rev. 4), excluding fuels and non-classified goods (see the Appendix). Fuels are excluded because of the volatility of oil prices which may distort the results. In addition, both the market shares of Greek fuel exports and the share of the latter in total Greek exports recorded changes more extensive than the average during the period under consideration, which may also distort the results. Note that all calculations are made in nominal terms, given the lack of sufficient data for the desired sectoral and geographical analysis merchandise trade in volume terms. As a result, it is not possible to separate the effects of changes in prices and in volumes, respectively, on market shares. A final note of caution relates to USD/EUR exchange rate movements. Since the figures are denominated in US dollars (USD), developments are also affected by fluctuations in the dollar exchange rate. For example, if the portion of USD-priced exports is lower for Greece than for the rest of the world, an appreciation of the USD vis-à-vis the euro leads, ceteris paribus, to a decrease in Greece's market share. Therefore, changing exchange rates and prices will have an impact on the evolution of market shares, thus affecting the competitiveness effect.[11]

5 RESULTS OF THE CMSA

5.1 OVERALL RESULTS

The analysis covers the 2005-2018 period; it includes several years prior to the Greek economic crisis and extends to the more recent years (2018). In order to facilitate the analysis, the period under consideration is divided into four distinct subperiods. The first subperiod refers to the years prior to the economic crisis, i.e. 2005-2008. The other three span the period from the start of the economic crisis to the most recent past, i.e. 2009-2018. In particular, the second subperiod (2009-2012) captures the onset of the Greek economic crisis, the initiation of the first economic adjustment programme, the pricing-in of the Greek redenomination risk and the implementation of the PSI programme. These events are expected to have impacted the availability of credit to Greek exporters.[12] The third subperiod (2013-2015) —still amid the Greek economic crisis— marks the stabilisation of the economy and runs until the resurgence of the Greek redenomination risk and the imposition of capital

11 On the mechanical impact of the USD exchange rate on USD-denominated exports, see also Task Force of the MPC of the ESCB (2005) and Amador and Cabral (2008).
12 For a discussion on credit and exports, see inter alia Del Prete and Federico (2014).

Table 1 Results of the constant market share analysis*

(excluding fuel, percentage changes, current prices)

Year/ Period	Exports growth rate		Total effect	Competitive-ness effect	Structure effect	Breakdown of the structure effect		
	Greece	World				Product composition effect	Geographical distribution effect	Interaction effect
	1	2	3=1-2=4+5	4	5=6+7+8	6	7	8
2005	8.5	9.6	-1.1	-2.1	1.0	0.3	0.4	0.3
2006	18.4	16.2	2.2	-4.8	7.0	1.1	3.5	2.5
2007	12.7	7.9	4.8	0.8	4.0	-1.2	5.2	0.1
2008	16.0	13.5	2.5	-2.9	5.3	1.7	2.9	0.8
2009	-20.5	-19.3	-1.2	-1.3	0.1	3.2	-3.5	0.5
2010	5.3	21.2	-15.8	-8.3	-7.5	-1.5	-7.6	1.6
2011	13.9	17.4	-3.5	-5.7	2.2	2.3	0.9	-1.0
2012	-8.6	-1.3	-7.3	-3.4	-3.9	-1.6	-4.6	2.3
2013	1.9	3.4	-1.4	-3.2	1.8	0.5	0.7	0.7
2014	1.2	2.5	-1.3	-1.9	0.6	-1.1	0.6	1.1
2015	-9.3	-8.4	-0.9	1.9	-2.8	-1.2	-2.4	0.8
2016	2.8	-2.1	4.9	1.5	3.4	-0.4	2.8	0.9
2017	6.1	3.2	2.9	-1.6	4.6	3.1	2.0	-0.5
2018	20.2	14.3	5.9	6.4	-0.5	-1.0	1.4	-1.0
Averages								
2005-2008	13.9	11.8	2.1	-2.3	4.3	0.5	3.0	0.9
2009-2018	1.3	3.1	-1.8	-1.6	-0.2	0.2	-1.0	0.5
2009-2012	-2.5	4.5	-7.0	-4.7	-2.3	0.6	-3.7	0.8
2013-2015	-2.1	-0.8	-1.2	-1.1	-0.1	-0.6	-0.4	0.9
2016-2018	9.7	5.1	4.6	2.1	2.5	0.6	2.1	-0.2

Source: United Nations, COMTRADE database; authors' own calculations.
* Table 1 should read as follows: column 3 is the difference of columns 1-2 or the sum of columns 4+5, and column 5 is the sum of columns 6+7+8. Due to rounding, numbers may not add up to totals.

controls in June 2015. The fourth subperiod refers to the more recent years, i.e. 2016-2018, during which the economy —despite the presence of capital controls— gradually entered a phase of recovery, mostly driven by strong export performance.

The pre-crisis subperiod is associated with increasing market shares of Greek exports, as is also the case with the fourth subperiod, while the two subperiods in between are characterised by declining market shares. It appears that the market share gains during the first (pre-crisis) subperiod were more than offset by the considerable drop during the subsequent two subperiods, affected also by financing constraints due to credit scarcity and the imposition of capital controls.[13] Despite the reversal of its downward trend that took place in the last subperiod, the Greek export market share at the end of 2018 still fell short of its end-2008 level. The results of the CMSA are summarised in Table 1 and Chart 3, where changes in market shares are broken down into components. In addition, the contribution of each destination area to the geographical distribution effect and the contribution of each product category

13 For a further discussion on exports, capital controls and the credit crunch in Greece, see Kotidis and Malliaropulos (2018).

Chart 3 Results of the constant market share analysis (all destinations and all products)

(excluding fuel, percentage changes, current prices)

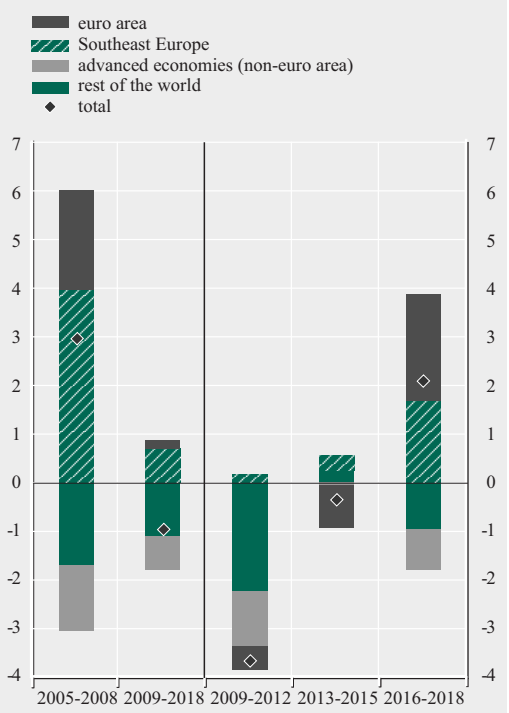
Source: United Nations, COMTRADE database; authors' own calculations.

to the product composition effect are shown in Charts 4 and 5.

Turning to a more detailed analysis, with respect to the pre-crisis subperiod (2005-2008), Greek exports appear, on average, to have gained market share, which can be attributed to the particularly strong positive structure effect that counterbalanced the large negative competitiveness effect. At this point, it should be noted that the developments in market shares, as captured by the competitiveness effect, are consistent with the decline in price/cost competitiveness observed throughout the 2000-2009 period and the prolonged appreciation of the real exchange rate. However, these competitiveness effect developments incorporate also the effect of non-price factors that may be associated with the position of the country in the international market, other than those related to the product/destination structure of Greek exports. The impact of the geographical distribution is almost exclusively responsible for the positive structure effect, as the product composition effect was quite small. The high growth rates of the euro area and SEE, which then absorbed 70% of Greek exports, explain the strong positive effect connected with the geographical composition, as indicated by the contribution of both areas (see Chart 4). On the other hand, the contribution of the advanced economies and the rest of the world to the geographical distribution effect was negative. Regarding the product composition effect, the contribution of food, beverages and tobacco, chemicals and plastics, and other manufactured products combined was almost offset by the negative contribution of machinery and transportation equipment (see Chart 5).

Chart 4 Contribution of destination markets to the geographical distribution effect

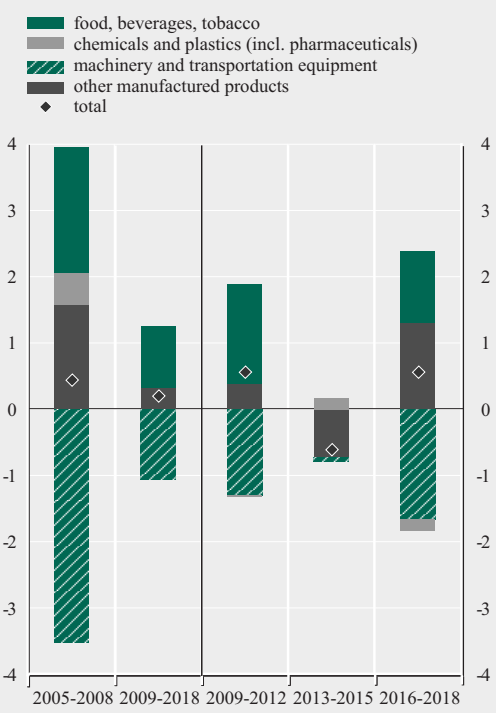
(excluding fuel, percentage changes, current prices)



Source: United Nations, COMTRADE database; authors' own calculations.

Chart 5 Contribution of product sectors to the product composition effect

(excluding fuel, percentage changes, current prices)



Source: United Nations, COMTRADE database; authors' own calculations.

This positive trend was reversed in the subsequent two subperiods (2009-2012 and 2013-2015) after the crisis broke out and Greek export market shares entered a path of decline. However, the declining trend began to decelerate (2013-2015), and in the last subperiod (2016-2018) Greek export market shares started increasing. The loss of market share is linked with the negative impact of both the competitiveness effect and the structure effect. The negative competitiveness effect appears to dominate, at least initially, even though it followed a declining trend, reflecting mostly the impact of: (a) the gradual recouping of pre-crisis price and cost competitiveness losses; and (b) the structural reforms implemented, in particular the measures aimed to enhance labour market flexibility. The fact that these competitiveness gains were not enough to support an even better performance can be associated with the still low ranking of the country in terms of non-price competitiveness. More specifically, financing constraints, coupled with excess bureaucracy and an unfavourable tax system, posed considerable obstacles to the attempts of exporting firms to enter new markets, in terms of new products and/or new destinations, and increase their shares in both old and new export markets.[14] To some extent, as mentioned earlier, the currency of denomination and exchange rate movements also affect the results.[15]

Regarding the structure effect, this turned negative —on average— in the 2009-2015 period, due to an adverse geographical distribution effect, while the product composition effect

14 See also the World Bank's *Doing Business reports* (various issues).
15 It is recalled that our analysis is performed on nominal USD-denominated export data. A depreciation of the euro vis-à-vis the USD will initially have a negative effect on Greece's nominal market shares, but a positive effect is expected to follow on the back of improved price competitiveness.

had a minimal impact. Specifically, the geographical distribution effect was particularly profound in the period 2009-2012, reflecting the global slowdown, and was more intense in the markets outside the euro area and SEE, i.e. the main destinations of Greek exports. However, it should be noted that the SEE region has always a positive contribution (see Chart 4), having the advantage of proximity and, in many cases, of shared borders that reduces freight costs.[16] On the other hand, the product composition effect had a minimal impact, as the small positive effect in the second subperiod was offset by a negative effect of equal magnitude in the third subperiod. The main positive contribution came from food, beverages and tobacco, while the effect from machinery and transportation equipment partly eroded these gains (see Chart 5).

In the last subperiod (2016-2018), a strong positive total effect was recorded, which indicates that the solid growth of Greek exports was associated with significant gains in market shares. In particular, the structure effect constituted the main force behind the gains in Greek export market shares. Indeed, the geographical distribution effect appears to have recovered and turned strongly positive, especially on account of the euro area and SEE, largely reflecting the high growth rates recorded in both these regions. The product composition effect turned positive and increased in absolute size relative to past subperiods on the back of the strong contribution of food, beverages and tobacco and of other manufactured products. The competitiveness effect was also positive, although smaller than the structure effect.

Overall, for the period that followed the crisis, the loss of market share of Greek exports is primarily linked with a negative, although diminishing, competitiveness effect, despite the considerable gains in price and cost competitiveness. That means that other factors, mainly related to non-price competitiveness such as difficulties in access to credit and political uncertainty, kept the competitiveness effect negative, although declining in absolute size. In addition, the drastic decline in the positive geographical distribution effect contributed to this result as well. Finally, it should be pointed out that the product composition effect of Greek exports throughout the period under consideration (before and after the crisis) is limited, which can be attributed to the fact that Greek exports traditionally consist of mostly low- and medium-technology products with not so fast increasing demand. Specifically, the sector of machinery and transportation had a negative contribution in all subperiods. At the same time, the sector of food, beverages and tobacco had a positive contribution.

5.2 RESULTS FOR THE INDIVIDUAL PRODUCT/DESTINATION MARKETS

In this subsection, we will examine the importance of the structure and competitiveness effects within broad destination and product markets, in an attempt to isolate the influence of specific characteristics of these destinations and products that make them more important for Greek exports. The distinct groups of countries belonging to the euro area and SEE have been chosen, as they receive the bulk of Greek exports. Both areas are of special interest because of the membership status and proximity, respectively. Two additional groups of countries are considered, with the first comprising the advanced economies outside the euro area and the second all other destinations. The grouping of products is based on their ranking in the revealed comparative advantage (RCA) status. The individual product categories are "food, beverages and tobacco", "chemicals and plastics", "machinery and transportation equipment" and "other manufactured products". The first two groups include products in which the country has a comparative advantage and therefore a relatively higher market share than the overall market share, while the third group

16 For a discussion on a gravity model approach for Greek exports, see for instance Papazoglou (2007).

Table 2 Results of the constant market share analysis by geographical destination*

(excluding fuel, percentage changes, current prices)

		Exports growth rate		Total effect	Competitiveness effect	Structure effect	Breakdown of the structure effect		
		Greece	World				Product composition effect	Geographical distribution effect	Interaction effect
	Period	1	2	3=1-2=4+5	4	5=6+7+8	6	7	8
Averages									
Euro area	2005-2008	13.2	11.3	1.8	-0.2	2.1	0.8	0.9	0.4
	2009-2018	1.7	1.4	0.2	-0.1	0.4	0.2	-0.3	0.5
	2009-2012	-3.8	-0.4	-3.4	-4.0	0.6	1.1	-1.2	0.6
	2013-2015	-0.5	-1.4	0.9	1.7	-0.8	-0.4	-1.5	1.1
	2016-2018	11.1	6.7	4.4	3.2	1.2	-0.3	1.9	-0.4
Southeast Europe	2005-2008	17.3	18.6	-1.3	-6.6	5.2	3.8	2.0	-0.5
	2009-2018	-0.4	3.3	-3.7	-3.6	-0.1	0.0	0.3	-0.4
	2009-2012	-4.4	3.0	-7.4	-6.4	-1.0	0.9	-1.6	-0.3
	2013-2015	-3.9	0.8	-4.7	-4.3	-0.4	0.1	0.7	-1.2
	2016-2018	8.3	6.0	2.3	-0.4	2.7	-0.1	2.7	0.1
Advanced economies (non-euro area)	2005-2008	8.0	8.2	-0.2	-3.1	3.0	2.2	0.8	0.0
	2009-2018	2.4	3.3	-1.0	-0.6	-0.4	-0.2	-0.7	0.5
	2009-2012	-3.1	4.7	-7.8	-6.4	-1.4	-0.7	-1.8	1.1
	2013-2015	4.0	0.5	3.4	3.5	-0.1	-0.4	0.4	-0.1
	2016-2018	8.1	4.3	3.8	3.1	0.7	0.7	-0.3	0.3
Rest of the world	2005-2008	21.1	17.3	3.8	-0.4	4.1	-0.1	6.2	-1.9
	2009-2018	2.3	4.6	-2.3	-2.0	-0.3	0.2	-1.8	1.3
	2009-2012	6.1	9.4	-3.3	-2.0	-1.3	1.0	-3.8	1.5
	2013-2015	-10.1	-1.9	-8.2	-9.2	1.0	0.2	-0.8	1.6
	2016-2018	9.7	4.7	5.0	5.1	-0.1	-0.7	-0.3	0.8

Source: United Nations, COMTRADE database, January 2019; authors' own calculations.
* Table 2 should read as follows: column 3 is the difference of columns 1-2 or the sum of columns 4+5, and column 5 is the sum of columns 6+7+8. Due to rounding, numbers may not add up to totals.

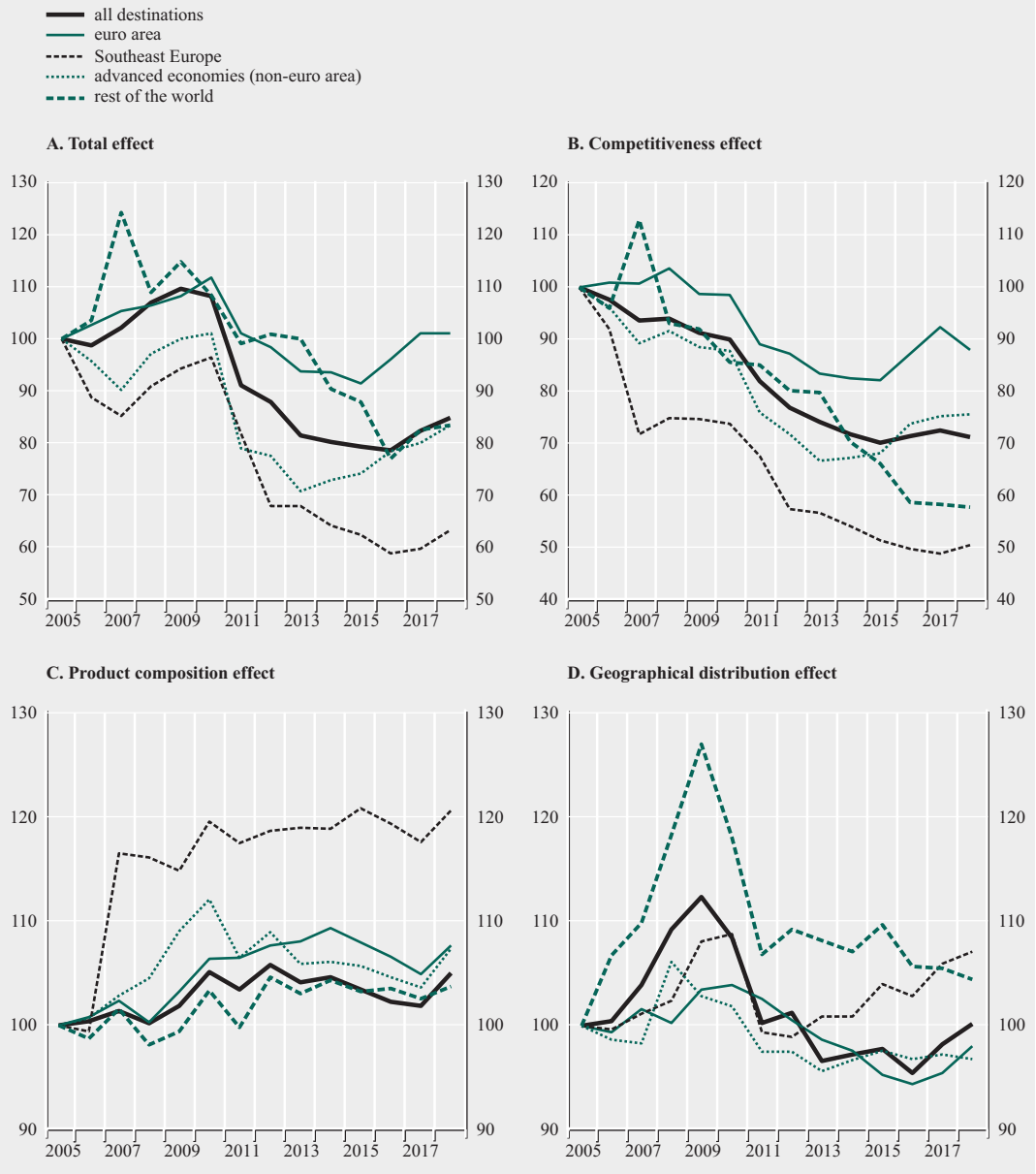
includes products characterised by dynamic export activity, despite their relatively smaller market shares. This analysis differs from the one in Section 5.1 as it focuses on each market and on each product category and attempts to break down the change in the export market share in each individual market into the different components, as described in Section 3.

5.2.1 Analysis by geographical destination

Although our analysis for each individual destination area revealed a number of common trends, a number of notable differences were identified. Table 2 and Chart 6 show the detailed results for the different markets and subperiods. In the pre-crisis subperiod (2005-2008), despite the negative competitiveness effect, Greek exports were gaining market shares on the back of a strong structure effect, with the exception of the SEE region, where this effect did not compensate for the negative competitiveness effect, resulting in market share loss in this area. In the euro area, the impact of the negative competitiveness effect is marginal compared with the other regions. This finding could reflect the positive effects

Chart 6 Results of the constant market share analysis by geopraphical destination (2005-2018)

(2005=100)



Source: United Nations, COMTRADE database; authors' own calculations.

of Greece's participation in the currency union. At the same time, the product composition effect is larger in SEE and the non-EU advanced economies relative to other regions. It is also almost equal to the geographical distribution effect in the euro area. Especially in the advanced economies, the product composition effect is the dominant driver of the structure effect. The geographical distribution effect is stronger in the rest of the world than in the other markets.

In the post-crisis period (2009-2018), the competitiveness effect, which prevails over the

structure effect, is negative, with lower absolute values in the euro area and the advanced economies than in the other areas. At the same time, the structure effect is weak. In the recent subperiod (2016-2018), with the exception of the SEE region, the competitiveness effect was positive in the other three areas, with the advanced economies posting the strongest effect among them. The structure effect was positive in all areas apart from the rest of the world, driven by the geographical effect in the euro area and the SEE countries and by the product effect in the non-euro area advanced economies.

5.2.2 Analysis by product category

In the pre-crisis period, our analysis for each product category indicated that —in general— Greek exports gained market share in all the key product markets, except that of other manufactured products, which includes most of the traditional Greek exports (textiles and apparel, metals, non-metallic minerals) characterised by low-to-medium technological content (see Table 3 and Chart 7). This development was the result of a positive structure effect, driven by the geographical distribution of exports within each market. Only in the

Table 3 Results of the constant market share analysis by product sector*

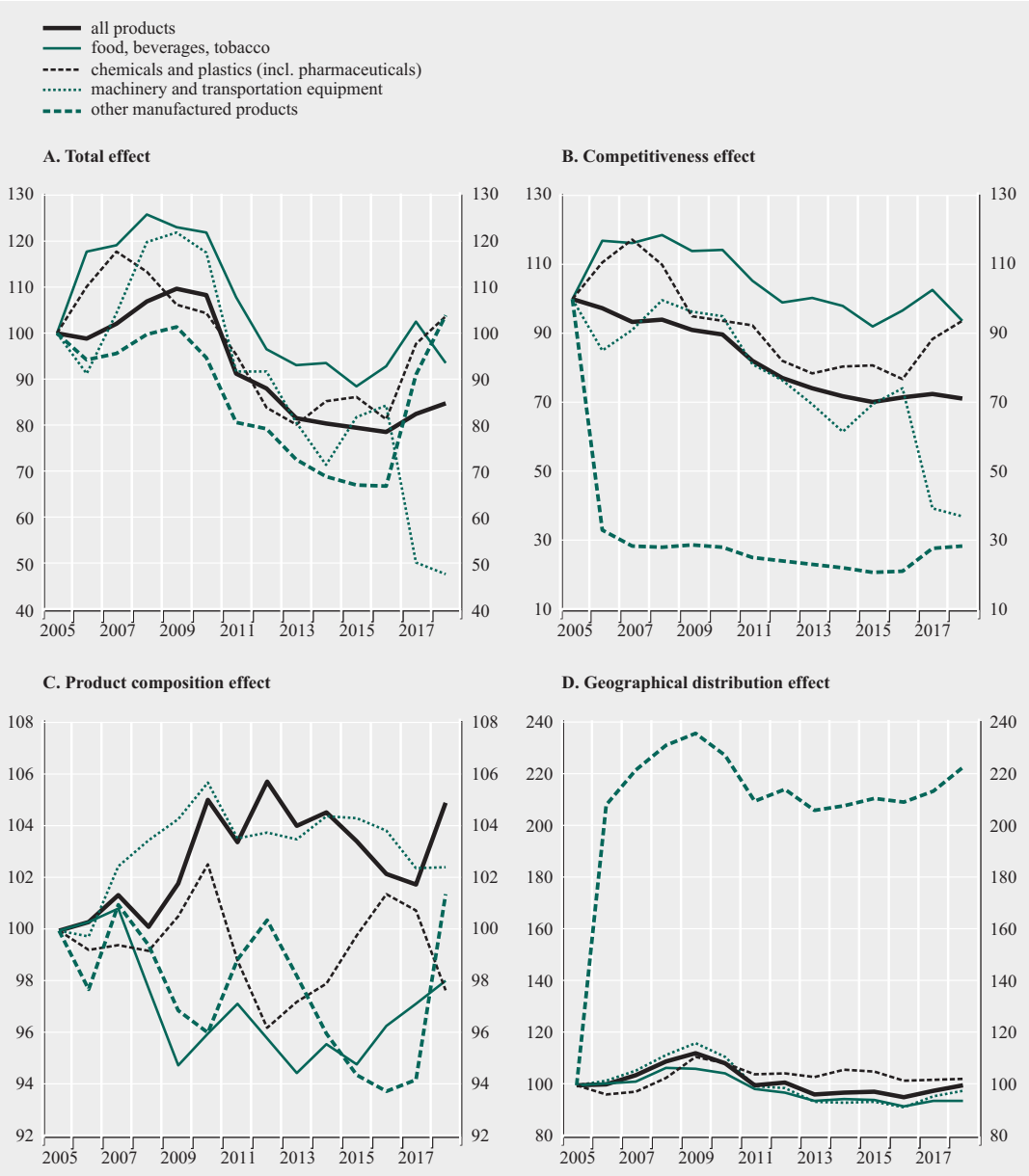
(excluding fuel, percentage changes, current prices)

		Exports growth rate		Total effect	Competitiveness effect	Structure effect	Breakdown of the structure effect		
		Greece	World				Product composition effect	Geographical distribution effect	Interaction effect
	Period	1	2	3=1-2=4+5	4	5=6+7+8	6	7	8
Averages									
Food, beverages, tobacco	2005-2008	18.5	11.9	6.7	4.9	1.7	-1.3	1.6	1.4
	2009-2018	2.1	4.3	-2.2	-1.4	-0.8	0.2	-1.2	0.2
	2009-2012	0.5	7.1	-6.6	-3.0	-3.6	-0.1	-3.1	-0.5
	2013-2015	-1.0	-0.9	0.0	-1.0	1.0	0.7	-0.7	1.1
	2016-2018	7.3	5.9	1.4	0.3	1.1	0.1	0.7	0.3
Chemicals and plastics (incl. pharmaceuticals)	2005-2008	14.9	13.2	1.7	-0.5	2.2	0.1	2.7	-0.6
	2009-2018	2.7	3.5	-0.8	0.0	-0.8	-0.5	-0.5	0.1
	2009-2012	-1.6	5.1	-6.7	-4.2	-2.5	-0.8	-1.8	0.1
	2013-2015	-1.5	-2.1	0.6	-0.4	1.0	1.4	-0.3	-0.1
	2016-2018	12.5	6.9	5.7	6.1	-0.4	-1.9	1.2	0.2
Machinery and transportation equipment	2005-2008	16.6	11.2	5.3	0.1	5.2	1.1	3.9	0.3
	2009-2018	0.9	3.2	-2.2	-1.5	-0.8	0.0	-1.5	0.7
	2009-2012	-5.5	3.9	-9.4	-7.0	-2.4	-0.2	-5.2	3.0
	2013-2015	2.2	0.2	2.0	2.9	-0.9	0.1	-0.8	-0.2
	2016-2018	8.1	5.1	3.0	1.4	1.6	0.2	2.7	-1.3
Other manufactured products	2005-2008	10.5	11.9	-1.4	-6.1	4.8	-0.3	3.4	1.7
	2009-2018	0.8	2.6	-1.9	-2.5	0.6	0.5	-0.4	0.5
	2009-2012	-3.4	4.5	-7.9	-5.2	-2.7	0.4	-3.3	0.1
	2013-2015	-4.5	-1.9	-2.6	-2.8	0.1	-1.5	0.5	1.2
	2016-2018	11.6	4.6	7.0	1.3	5.7	2.9	2.6	0.2

Source: United Nations. COMTRADE database; authors' own calculations.
* Table 3 should read as follows: column 3 is the difference of columns 1-2 or the sum of columns 4+5, and column 5 is the sum of columns 6+7+8. Due to rounding, numbers may not add up to totals.

Chart 7 Results of the constant market share analysis by product sector (2005-2018)

(2005=100)



Source: United Nations COMTRADE database; authors' own calculations.

food, beverages and tobacco sector was the competitiveness effect significantly positive. This is an exception to the situation in the total product market. In all other markets, the competitiveness effect was negative and only recently (2016-2018) there has been a strong reversal in the sectors of chemicals and plastics and of other manufactured products. In all product categories, the strongly negative geographical effect in the early years of the crisis (2009-2012) weakened in the following subperiod and turned positive in the recent period. This effect could reflect the economic growth trajectory of the main Greek export markets

(i.e. the euro area and SEE). Another striking finding is the strong positive product composition and geographical distribution effects of other manufactured products in the recent period that can be attributed to improvements in the technological content, quality and marketing of these products.

6 CONCLUSIONS

This analysis examined the evolution of the total market share of Greek exports in the world market during the period 2005-2018, with particular focus on the period after the 2008 crisis, and investigated the effects of their composition by product and by geographical destination on Greece's position in foreign markets. Changes in market shares were approximated by the growth differential between Greek exports and exports of Greece's major trading partners that are defined here as the "world".

According to the results of the analysis, during the pre-crisis period (2005-2008), Greek exports gained market share, as their growth rate outpaced world export growth. By contrast, the increase in Greek exports during most of the period 2009-2018 was slower than the corresponding increase in world exports, resulting in an average annual market share loss of 1.8%. However, the loss is concentrated in the period 2009-2015, as the most recent period of 2016-2018 saw an increase of about 4.6% in the share of Greek exports in the world export market. Greek export market shares have not yet returned to their 2008 levels, despite the significant cost and price competitiveness gains during the period 2010-2015.

It should be noted that a large part of the changes in market shares, in this analysis, is explained by the product/destination structure of Greek exports, while the calculated competitiveness effect is a residual that includes all factors other than prices and structure, which could strengthen the country's position in foreign markets, but have not yet had time to exert an adequate positive influence.

The limited impact of the product composition of Greek exports should also be stressed, and this concerns the period both before and after the crisis. This means that Greek exports consist mainly of products for which demand is below the world average. Therefore, an improvement in the performance of Greek exports would require a shift to high-demand products on the world markets. This requires a further restructuring of the country's production base with the aim of strengthening industries with higher technology content. Of course, attracting sufficient foreign investment in these sectors would be an important prerequisite for this to happen. Finally, Greek exports could benefit from a further expansion of their share into more dynamic markets such as South East Asia, although so far the destination structure of Greek exports seems to have had a rather positive influence.

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APPENDIX

Greece's major trading partners – "World"

EU Member States		Non-EU countries	
Austria	Italy	Albania	Mexico
Belgium	Latvia	Algeria	Morocco
Bulgaria	Lithuania	Argentina	New Zealand
Croatia	Luxembourg	Australia	Norway
Cyprus	Malta	Brazil	Republic of North Macedonia
Czechia	Netherlands	Canada	Philippines
Denmark	Poland	Chile	Russian Federation
Estonia	Portugal	China	Serbia
Finland	Romania	Egypt	Singapore
France	Slovakia	Hong Kong	South Africa
Germany	Slovenia	Iceland	South Korea
Greece	Spain	India	Switzerland
Hungary	Sweden	Indonesia	Thailand
Ireland	United Kingdom	Israel	Turkey
		Japan	Ukraine
		Malaysia	United States of America

Geographical destination areas

Euro area			
Austria	France	Lithuania	Slovakia
Belgium	Germany	Luxembourg	Slovenia
Cyprus	Ireland	Malta	Spain
Estonia	Italy	Netherlands	
Finland	Latvia	Portugal	
Southeast Europe			
Albania	Croatia	Serbia	Turkey
Bulgaria	Romania	Republic of North Macedonia	
Advanced economies (non-euro area)			
Czechia	Sweden	Canada	South Korea
Denmark	Switzerland	Israel	United States of America
Iceland	United Kingdom	Japan	
Norway	Australia	New Zealand	
Rest of the world			
Belarus	Egypt	Syria	Singapore
Hungary	Iran	China	Thailand
Poland	Kuwait	Hong Kong	Argentina
Russian Federation	Morocco	India	Brazil
Ukraine	Oman	Indonesia	Chile
Algeria	Qatar	Malaysia	Mexico
Bahrain	Saudi Arabia	Philippines	South Africa

SITC code (two-digit) and description

Food, beverages & tobacco	
00	Live animals other than animals of division 03
01	Meat and meat preparations
02	Dairy products and birds' eggs
03	Fish (not marine mammals), crustaceans, molluscs and aquatic invertebrates, and preparations thereof
04	Cereals and cereal preparations
05	Vegetables and fruit
06	Sugars, sugar preparations and honey
07	Coffee, tea, cocoa, spices, and manufactures thereof
08	Feeding stuff for animals (not including unmilled cereals)
09	Miscellaneous edible products and preparations
11	Beverages
12	Tobacco and tobacco manufactures
22	Oil-seeds and oleaginous fruits
29	Crude animal and vegetable materials, n.e.s.
41	Animal oils and fats
42	Fixed vegetable fats and oils, crude, refined or fractionated
43	Animal or vegetable fats and oils, processed; waxes of animal or vegetable origin; inedible mixtures or preparations of animal or vegetable fats or oils, n.e.s.
Chemicals & plastics	
23	Crude rubber (including synthetic and reclaimed)
27	Crude fertilizers, other than those of division 56, and crude minerals (excluding coal, petroleum and precious stones)
51	Organic chemicals
52	Inorganic chemicals
53	Dyeing, tanning and colouring materials
54	Medicinal and pharmaceutical products
55	Essential oils and resinoids and perfume materials; toilet, polishing and cleansing preparations
56	Fertilizers (other than those of group 272)
57	Plastics in primary forms
58	Plastics in non-primary forms
59	Chemical materials and products, n.e.s.
62	Rubber manufactures, n.e.s.
Machinery & transportation equipment	
71	Power-generating machinery and equipment
72	Machinery specialized for particular industries
73	Metalworking machinery
74	General industrial machinery and equipment, n.e.s., and machine parts, n.e.s.
75	Office machines and automatic data-processing machines
76	Telecommunications and sound-recording and reproducing apparatus and equipment
77	Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical counterparts, n.e.s., of electrical household-type equipment)
78	Road vehicles (including air-cushion vehicles)
79	Other transport equipment
87	Professional, scientific and controlling instruments and apparatus, n.e.s.
88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks
Other manufactured products	
21	Hides, skins and furskins, raw
24	Cork and wood
25	Pulp and waste paper
26	Textile fibres (other than wool tops and other combed wool) and their wastes (not manufactured into yarn or fabric)
28	Metalliferous ores and metal scrap
61	Leather, leather manufactures, n.e.s., and dressed furskins
63	Cork and wood manufactures (excluding furniture)
64	Paper, paperboard and articles of paper pulp, of paper or of paperboard
65	Textile yarn, fabrics, made-up articles, n.e.s., and related products
66	Non-metallic mineral manufactures, n.e.s.
67	Iron and steel
68	Non-ferrous metals
69	Manufactures of metals, n.e.s.
81	Prefabricated buildings; sanitary, plumbing, heating and lighting fixtures and fittings, n.e.s.
82	Furniture and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings
83	Travel goods, handbags and similar containers
84	Articles of apparel and clothing accessories
85	Footwear
89	Miscellaneous manufactured articles, n.e.s.