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# THE CURRENT ACCOUNT ADJUSTMENT IN GREECE DURING THE CRISIS: CYCLICAL OR STRUCTURAL?

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## ABSTRACT

The substantial narrowing of the Greek current account deficit – by more than 13 percentage points of GDP – constitutes a significant part of the overall adjustment of the economy in the 2008-2019 period. A major issue, however, is related to whether the factors driving this external correction are temporary, due mostly to the economic cycle, or structural, in which case they are expected to be sustained over the medium term. In this paper we evaluate the degree to which cyclical versus structural developments have driven the pattern of correction of the country's external imbalance, as this is essential in assessing its evolution going forward. Our analysis shows that the current account adjustment has in a considerable part been driven by structural factors, which according to our baseline scenario account for 60% of the overall adjustment. Therefore, most of the correction is of a permanent nature, which means that the relatively high deficits of the pre-crisis period are not expected to re-emerge any time soon. Our results are robust to various income elasticities of trade; the non-cyclical component ranges from 47% to 74% of the current account deficit correction.

**Keywords:** cyclically adjusted current account; macroeconomic imbalances; output gap; current account; business fluctuations

**JEL classification:** F32; F40; E32

# Η ΠΡΟΣΑΡΜΟΓΗ ΤΟΥ ΕΛΛΕΙΜΜΑΤΟΣ ΤΟΥ ΙΣΟΖΥΓΙΟΥ ΤΡΕΧΟΥΣΩΝ ΣΥΝΑΛΛΑΓΩΝ ΤΗΣ ΕΛΛΑΔΟΣ ΚΑΤΑ ΤΗ ΔΙΑΡΚΕΙΑ ΤΗΣ ΚΡΙΣΗΣ: ΚΥΚΛΙΚΗ Ή ΔΙΑΡΘΡΩΤΙΚΗ;

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## ΠΕΡΙΛΗΨΗ

Η σημαντική μείωση του ελλείμματος του ισοζυγίου τρεχουσών συναλλαγών της Ελλάδος – πάνω από 13 ποσοστιαίες μονάδες του ΑΕΠ – αποτελεί κεντρικό παράγοντα της συνολικής προσαρμογής της οικονομίας την περίοδο 2008-2019. Ένα μείζον ερώτημα, ωστόσο, σχετίζεται με το αν οι παράγοντες που οδήγησαν σ' αυτή τη διόρθωση της εξωτερικής ανισορροπίας είναι προσωρινοί, αποτέλεσμα κυρίως του οικονομικού κύκλου, ή διαρθρωτικοί, οπότε αναμένεται να διατηρηθούν μεσοπρόθεσμα. Στο παρόν άρθρο εξετάζουμε τη σχετική σημασία των κυκλικών και των διαρθρωτικών παραγόντων που συνέβαλαν στη διόρθωση της ανισορροπίας του εξωτερικού τομέα της χώρας. Αυτό είναι απαραίτητο για την αξιολόγηση της εξέλιξης του εξωτερικού τομέα μεσοπρόθεσμα. Η ανάλυσή μας δείχνει ότι η προσαρμογή του ισοζυγίου τρεχουσών συναλλαγών οφείλεται σε μεγάλο βαθμό σε διαρθρωτικούς παράγοντες, οι οποίοι σύμφωνα με το βασικό σενάριό μας αντιστοιχούν στο 60% της συνολικής προσαρμογής. Επομένως, το μεγαλύτερο μέρος της διόρθωσης είναι μόνιμου χαρακτήρα, πράγμα που σημαίνει ότι τα σχετικά υψηλά ελλείμματα της περιόδου πριν από την κρίση δεν αναμένεται να επανεμφανιστούν σύντομα. Τα αποτελέσματά μας εξακολουθούν να ισχύουν σε διάφορες τιμές εισοδηματικής ελαστικότητας των εμπορικών συναλλαγών και η μη κυκλική συνιστώσα της προσαρμογής κυμαίνεται από 47% έως 74% της συνολικής διόρθωσης του ελλείμματος του ισοζυγίου τρεχουσών συναλλαγών.

# THE CURRENT ACCOUNT ADJUSTMENT IN GREECE DURING THE CRISIS: CYCLICAL OR STRUCTURAL?<sup>1</sup>

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## I INTRODUCTION

The adjustment of the Greek economy in recent years is primarily linked with the significant correction of large macroeconomic imbalances generated in the run-up to the economic crisis of 2008 and includes, inter alia, a major improvement in the external sector. In particular, the reduction of the current account deficit during the crisis was indeed remarkable, since it fell from 15.1% of GDP in 2008 to 1.4% of GDP by the end of 2019 (see Chart 1). This undoubtedly constitutes a success story for the Greek economy.

An important issue – which has drawn a lot of attention recently<sup>2</sup> – refers to the extent to which this adjustment will be sustained over the medium term. This depends on the magnitude of the part of the external correction that can be attributed to the economic cycle, relative to the part that was the result of structural factors, which are independent of the cycle and, therefore, more permanent in nature. In particular, the cyclical part is primarily related to the large negative output gap of the post-crisis period. This in turn was the result of the large decline in domestic demand, which, through a considerable drop in imports, contributed to the reduction of the current account deficit. Moreover, the correction associated with cyclical factors is the result of the deeper recession of the Greek economy in comparison with the economies of its major trading partners, a differential that allowed imports to fall faster than exports, lowering the Greek current account deficit. The size of such cyclical adjustment is what raises

concerns about the sustainability of the overall improvement in the recovery phase of the cycle. That is, as the economy recovers and the country's real GDP approaches its potential level, raising the prospect of a positive output gap in the medium term, the likelihood increases that the large external deficits of the past might re-emerge.

On the other hand, to the extent that a significant part of the current account correction can be attributed to structural factors, the achieved adjustment will be permanent. That is, structural factors are, among other things, associated with competitiveness gains as a result of productivity growth, improved fiscal positions, stronger institutions, a shift of production towards tradable sectors, financial deepening and favourable demographic changes. The evolution of these factors could be of significant importance in capturing broad medium-term trends in external imbalances. For instance, to the extent that the decline in the current account deficit is attributable to rising exports, resulting from competitiveness gains, it reflects structural changes and is expected to persist over the medium term.

Consequently, the answer to the question on whether the current account deficit will eventually return to its pre-crisis level is critically linked with the nature (cyclical or structural) of the achieved external sector correction. The aim of this paper is to investigate which part of

<sup>1</sup> The authors would like to thank H. Balfoussia for her useful comments and invaluable insights. The views expressed are of the authors and do not necessarily reflect those of the Bank of Greece. The authors are responsible for any errors or omissions.

<sup>2</sup> For example, see IMF (2019).

the accomplished adjustment is the result of cyclical factors and thus will fade away in the medium term and which part is due to structural factors and therefore is more likely to stay. In Section 2 we examine in more detail recent developments in the Greek current account. The methodology and data employed are explained in Section 3. The results of the analysis and their robustness check are discussed in Sections 4 and 5, respectively. Finally, the concluding remarks of the analysis are presented in Section 6.

## 2 DEVELOPMENTS IN THE GREEK CURRENT ACCOUNT

As pointed out, the current account deficit reached its peak of EUR 36.6 billion (15.1% of GDP) in 2008 at the outbreak of the global financial crisis and just before the collapse of world trade that followed in 2009 (see Chart 1). The lead-up to the economic crisis (i.e. 2002-2008) was characterised by low private savings, which could not meet the investment needs of the economy and, combined with extensive fiscal imbalances, led to the build-up of sizeable external imbalances.<sup>3</sup> In terms of the trade balance, there had been a rising goods deficit, only partially counterbalanced by the services (mainly travel and sea transport) surplus, which remained rather stable at a relatively low level. As an overall assessment, the country's entry into the Monetary Union increased domestic demand which, reinforced further by a pro-cyclical fiscal policy, pushed upwards imports and the trade deficit, while productive resources were to a great extent trapped into non-tradable sectors.

At the same time, exports of goods were rising and gaining market share, as Greek exporters managed to exploit their position in the South-east European markets,<sup>4</sup> compensating for the loss in cost/price competitiveness (largely due to competition from Asian countries) and for the less favourable product composition of Greek exports (which mainly consisted of low- to medium-technology products).<sup>5</sup> Despite

that, exports remained at approximately one-third of imports and their expansion was not fast enough to outweigh the increasing goods balance deficit. It should also be noted that exports and investment (concentrated mostly in housing construction) have a considerable import content of approximately 31% and 41%, respectively.<sup>6</sup>

The decade after the crisis (i.e. 2009-2019) has been characterised by a substantial improvement in the Greek external balance. The current account deficit dropped by 13.7 percentage points (pp) and reached 1.4% of GDP in 2019. Most of the adjustment can be attributed to exports of goods, which increased to 17.3% of GDP from 9.1% of GDP in 2008. Shrinking domestic demand urged domestic producers to intensify their efforts to enter and expand into foreign markets. At the same time, exports of services adjusted upwards, albeit at a weaker pace due to the underperformance of sea transport and the slow recovery of tourism. Overall, since the end of 2009, exports of goods and services excluding sea transport have increased by 64% at constant prices (while exports of goods increased by almost 62% over the same period). At the same time, imports have dropped by 30% since their peak in 2008. Imports started rising again after 2016 as a response to the improvement of economic activity and the need for replacing capital equipment, which raises concerns over whether the current account improvement can be sustained if growth in all components of domestic demand and exports accelerates. However, despite the fact that imports are needed for growth, there have been some substantial structural changes in the Greek economy during this adjustment, especially on the side of exports, that could help sustain the external rebalancing achieved.

The recovery in competitiveness is complete in terms of cost and almost complete in terms of

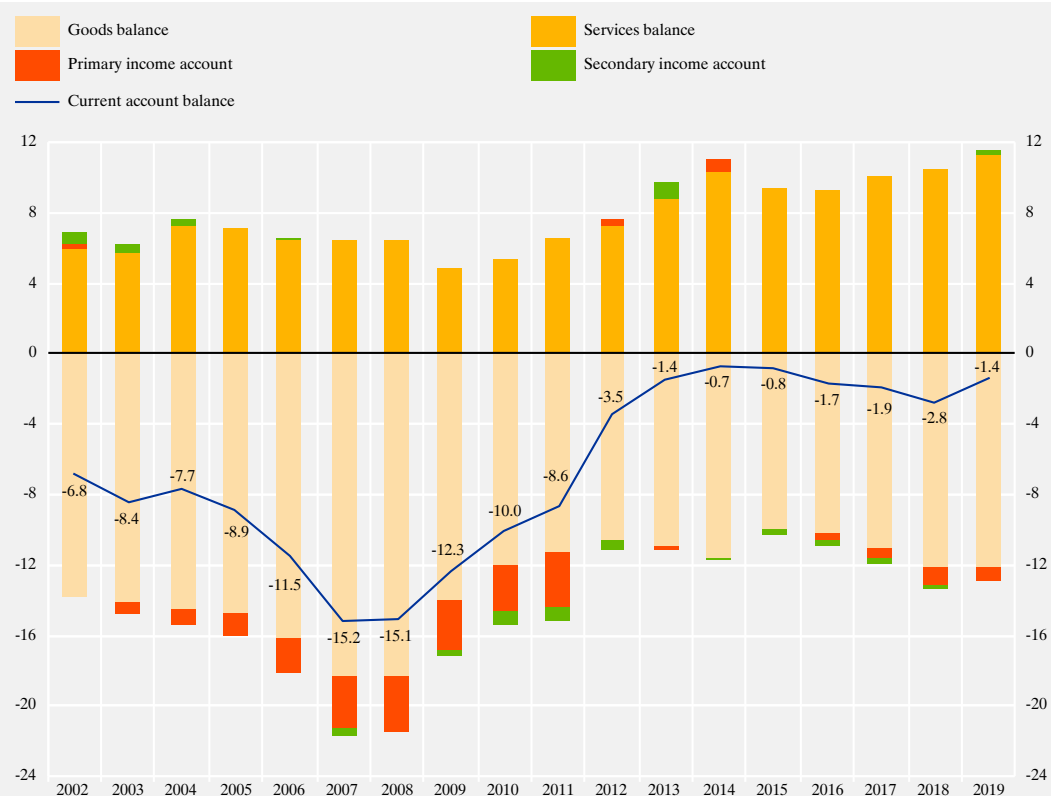
<sup>3</sup> See Bank of Greece (2020).

<sup>4</sup> See Papazoglou (2007).

<sup>5</sup> See Backinezos et al. (2019) and Athanasoglou et al. (2010).

<sup>6</sup> See Bank of Greece (2018a).

Chart I Current account balance components as % of GDP



Sources: Bank of Greece, Balance of Payments Statistics, and ELSTAT, National Accounts.

price, while some substantial improvement in non-price competitiveness has also been achieved. Greek exports, particularly non-oil exports, lost their market share in the beginning of the crisis but started regaining and maintaining their position in international markets since 2016. Continuing the implementation of structural reforms in product markets and institutions will further increase competitiveness, especially non-price. In addition, while the sectoral distribution of Greek exports has not changed considerably, it has started contributing in a positive way to the expansion into foreign markets, allowing exporters to benefit from the prolonged rise in cost/price competitiveness.<sup>7</sup>

Domestic firms have become more export-oriented, although they went through a period of economic contraction.<sup>8</sup> In many sectors, the

proportion of domestic output exported has increased and it is most unlikely that these exporters will retract from their positions in international markets in favour of the domestic market. Furthermore, a considerable share of Greek exports relies on products that are less elastic to foreign demand changes (such as food and pharmaceuticals which represent 26% and 9% of total non-oil exports, respectively) and therefore more resilient to foreign demand changes, as the reaction to the recent (2019) slowdown in the world economy has proven.

With regard to tourism, its performance in 2019 showed that the image of the country has improved significantly, since a considerable

<sup>7</sup> See Backinezos et al. (2019).

<sup>8</sup> See Bank of Greece (2017).

rise in average expenditure per trip was recorded, reflecting a shift towards higher-income travellers, in contrast with developments in past years when travel receipts were driven mainly by the large numbers of arrivals.<sup>9</sup> Besides, since 2002 there has been a quality improvement in the Greek-controlled fleet, which since 2011 is younger than or on a par with the world fleet. This fleet renewal was supported by the exceptionally advantageous freight markets in 2007-2008 and the availability of ship finance in that period. Moreover, Greek-controlled shipping expanded into new sectors such as the carriage of Liquefied Natural Gas that required fresh investment in technologically advanced vessels (Greek Shipping Co-operation Committee). Finally, on the back of all those changes, exports grew as a proportion of imports leading to the contraction of the goods and services balance deficit, which accounts for the bulk of the current account. Also, such changes are more structural in nature and are expected to have more permanent effects on the export performance of the Greek economy.

### 3 METHODOLOGY AND DATA

In the literature, there are two main streams in analysing the adjustment of the current account balance, in order to isolate the cyclically adjusted (or structural) current account. The first stream is based on the intertemporal approach of the current account and, relying on a variety of parameters such as macroeconomic variables, demographics, the financial, political and institutional environment, etc., directly estimates the structural component of the current account. It is mostly employed by international institutions through the use of country panel data.<sup>10</sup> The second stream calculates the cyclically adjusted trade balance indirectly after estimating the cyclical component. The estimation of the latter is based on the output gaps of home and trading partners, as well as on the income elasticities of imports and exports.<sup>11</sup> In our analysis, we follow the methodology employed in the second stream.

Specifically, our methodology closely follows Haltmaier (2014) and is augmented with Fabiani et al. (2016). According to the IMF (2009), “the current account shows flows of goods, services, primary income, and secondary income between residents and nonresidents”. Therefore, in nominal terms, it is presented as:

$$ca = x - m + bpi + bsi \quad (1)$$

where:

ca: current account balance (nominal);

x: exports of goods and services (nominal);

m: imports of goods and services (nominal);

bpi: balance of primary income (e.g. compensation of employees, dividends, interest, etc., nominal); and

bsi: balance of secondary income (e.g. personal transfers, current international assistance, etc., nominal).

Our objective is to separate the cyclical from the non-cyclical element of the current account. In our analysis, the adjustment concerns exclusively the exports and imports of goods and services, i.e. the trade balance.

We first define:

$\Delta X$  ( $\Delta M$ ) as the difference between the potential and the observed level of real exports (imports), i.e. the cyclical component of the exports (imports).

Then from the export side of the trade balance we have:

$$\Delta X = X^* - X \quad \text{or} \quad X^* = X + \Delta X \quad (2)$$

where:

<sup>9</sup> See Bank of Greece (2019a).

<sup>10</sup> See for instance the IMF’s External Balance Assessment (EBA) methodology in Phillips et al. (2013).

<sup>11</sup> See for instance Haltmaier (2014).

$X^*$ : potential exports (real), i.e. the level of exports consistent with trading partners' potential output; and

$X$ : observed exports (real).

Let's define as  $\theta_x$  ( $\theta_M$ ) the elasticity of real exports (imports) with respect to the real GDP of trading partners (of the home economy).

$$\theta_x = \frac{\Delta X/X}{\Delta Y^f/Y^f} \quad (3)$$

where:

$Y^f$ : trading partners' real GDP; and

$\Delta Y^f$ : the difference between the potential real GDP ( $Y^{*f}$ ) and the observed real GDP of trading partners.

Equation (3) can be rewritten as:

$$\frac{\Delta X}{X} = \theta_x \frac{\Delta Y^f}{Y^f} \quad (4)$$

Substituting equation (4) in equation (2), we get:

$$X^* = X + \Delta X = X \left( 1 + \theta_x \frac{\Delta Y^f}{Y^f} \right) \quad (5)$$

The output gap is defined as:

$$y^f = \frac{Y^f - Y^{*f}}{Y^{*f}}$$

and it can be rearranged as:

$$\frac{Y^{*f}}{Y^f} = \frac{1}{1+y^f} \quad (6)$$

Rearranging the last element of equation (5) ( $\frac{\Delta Y^f}{Y^f}$ ) and substituting equation (6), we get:

$$\frac{\Delta Y^f}{Y^f} = -\frac{y^f}{1+y^f} \quad (7)$$

Finally, we substitute (7) into (5) and we get:

$$X^* = X + \Delta X = X \left( 1 - \theta_x \frac{y^f}{1+y^f} \right) \quad (8)$$

or

$$\Delta X = -X \theta_x \frac{y^f}{1+y^f} \quad (9)$$

If we assume that the export prices ( $P_x$ ) remain unchanged, the cyclical component of exports in nominal terms is:

$$\Delta x = -P_x X \theta_x \frac{y^f}{1+y^f} = -x \theta_x \frac{y^f}{1+y^f} \quad (10)$$

and the corresponding cyclically adjusted nominal exports are:

$$x^* = x + \Delta x = x \left( 1 - \theta_x \frac{y^f}{1+y^f} \right) \quad (11)$$

Accordingly, the equations for nominal imports are as follows:

Cyclical component of imports in nominal terms:

$$\Delta m = -P_M M \theta_M \frac{y}{1+y} = -m \theta_M \frac{y}{1+y} \quad (12)$$

Cyclically adjusted nominal imports:

$$m^* = m + \Delta m = m \left( 1 - \theta_M \frac{y}{1+y} \right) \quad (13)$$

Therefore, the cyclically adjusted nominal trade balance is given by:

$$\begin{aligned} tb^* &= x \left( 1 - \theta_x \frac{y^f}{1+y^f} \right) - m \left( 1 - \theta_M \frac{y}{1+y} \right) \\ &= x - m - x \theta_x \frac{y^f}{1+y^f} + m \theta_M \frac{y}{1+y} \\ &= tb - x \theta_x \frac{y^f}{1+y^f} + m \theta_M \frac{y}{1+y} \end{aligned} \quad (14)^{12}$$

It follows from equation (1) that the cyclically adjusted current account (in nominal terms) will be:

$ca^* = tb^* + bpi + bsi$  or

$$ca^* = ca - x \theta_x \frac{y^f}{1+y^f} + m \theta_M \frac{y}{1+y} \quad (15)$$

Finally, the current account as a percentage of nominal GDP ( $Y_{nom}$ ) is:

$$\begin{aligned} \frac{ca^*}{Y_{nom}} &= \frac{ca}{Y_{nom}} - \frac{x}{Y_{nom}} \theta_x \frac{y^f}{1+y^f} \\ &\quad + \frac{m}{Y_{nom}} \theta_M \frac{y}{1+y} \end{aligned} \quad (16)$$

<sup>12</sup> In the special case that  $\theta_x = \theta_M = \theta$ , then  $tb^* = tb - \theta \left( x \frac{y^f}{1+y^f} - m \frac{y}{1+y} \right)$ .

Therefore, the cyclically adjusted current account balance (as a percentage of GDP) results from the difference between the actual balance and the cyclical component. The cyclical component, in turn, depends on the share of nominal exports and imports in GDP, the income elasticities of exports and imports and finally the output gaps of the home economy and of its trading partners.

Thus, in order to isolate the cyclical part of the adjustment, two elements of information are required. The first is related to the intensity of the economic cycle in the home economy and its major trading partners, which is measured by the magnitude of their output gaps. The second concerns the sensitivity of the current account balance to changes in the output gap, which relates to the export and import elasticity of GDP of the trading partners and the home country, respectively.

The impact of the economic cycle on the external sector is primarily reflected in its impact on the trade balance, which is the main part of the current account balance. Changes in the other two parts of the current account (primary and secondary income balances) are considered to be structural in nature.<sup>13</sup>

In our research, we do not estimate the income elasticities of export and imports; we rather employ the elasticities estimated in other research work. In our baseline scenario, we employ an elasticity of 1.5 for both exports and imports with respect to income, which reflects the European Commission's approach as described in Salto and Turrini (2010). We also need to assume home imports and exports as isoelastic to home and foreign GDP, respectively. This means that they are exogenously given constant long-run elasticities,  $\theta_x$  and  $\theta_M$  (Fabiani et al. 2016; Amador and Silva 2019).

The robustness of our results is confirmed by a sensitivity analysis based on a wide range of elasticities from 1.0 to 2.0. This approach allows us to identify the potential discrepancies among research work that employed different

import and export income elasticities. Finally, as trade elasticities differ over time (let alone among countries), our sensitivity analysis allows us to better assess the cyclical and non-cyclical adjustment of the Greek current account deficit.

For the current account components, the Bank of Greece Balance of Payments data for the period 2002-2019 were used. Greece's output gap, as estimated by the Bank of Greece, was employed in our analysis (Bank of Greece 2018b and 2019b), while trading partners' output gap is the trade-weighted output gap of the main trading partners, as provided by AMECO and the IMF's *World Economic Outlook*, and using the ECB's trade shares (see Appendix A).

#### 4 ANALYSIS AND RESULTS

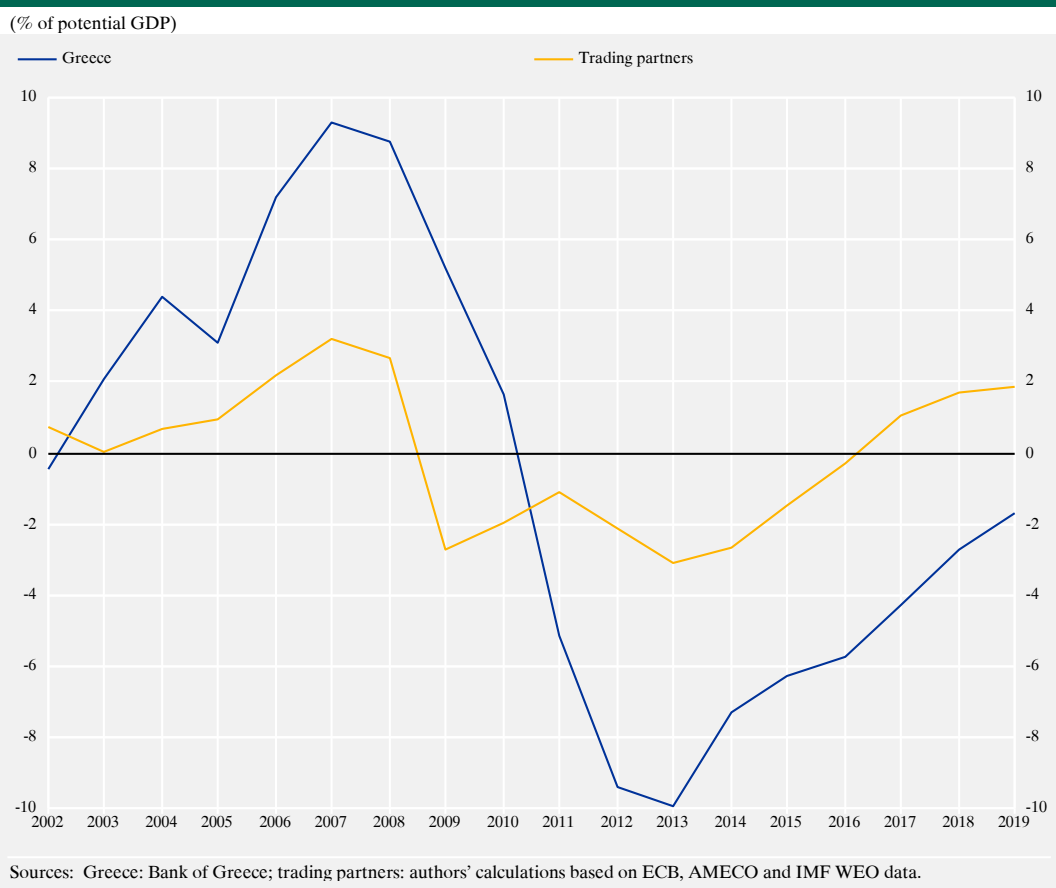
In the period 2003-2010, Greece had a positive output gap, which indicated that actual imports in that period were above the level that corresponds to potential output. Starting from 2011, Greece moved into a negative output gap – as a result of the Greek economic crisis – which peaked in 2013; thereafter, the output gap has been following a gradually narrowing trend (see Chart 2). Thus, imports have been below the level that corresponds to potential output.

Turning to Greece's main trading partners, the magnitude of their trade-weighted output gap is significantly smaller, compared with Greece. This reflects, on the one hand, the magnitude of the Greek recession and, on the other hand, the fact that trading partners' output gap is calculated as the weighted average of 32 countries that may stand at different points in their economic cycles. Overall, for the period 2009-2016, trading partners were – on average – faced by a mildly negative output gap, partly

<sup>13</sup> After all, most of these categories include, on the one hand, receipts, in particular inflows from EU structural funds, and, on the other hand, outflows, primarily interest payments to the support mechanism for servicing public debt. Therefore, they are not linked with the economic cycle, as they are structural in nature.



Chart 2 Output gap: Greece and trading partners



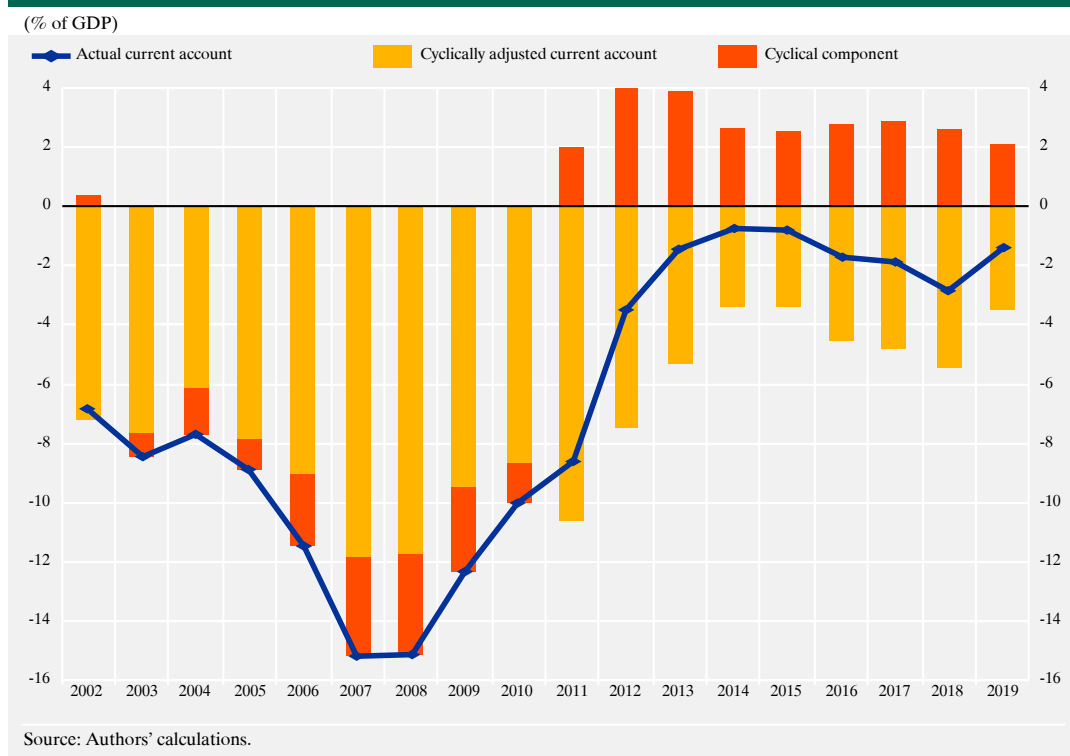
reflecting the global financial crisis and the euro area sovereign crisis (see Chart 2). Therefore, Greek exports were below the level that is consistent with the potential output of trading partners in that period.

As discussed in Section 2, the actual current account deficit kept increasing from 2005 until 2008, as both the cyclical and the non-cyclical components of the trade balance were deteriorating; the former due to the positive output gaps in Greece and in its trading partners. Over the same period, the balance of primary and secondary income (bpi+bsi) was in deficit and widening, before stabilising at around -3.3% of GDP in 2007. From 2009 onwards, the current account deficit is on a downward trajectory and stabilised at around 2% of GDP – on average – in the 2016-2019 period. In the

first years of the Greek economic crisis (2011-2012), the actual current account adjustment was mainly driven by the cyclical component (i.e. Greece's and its trading partners' output gaps) and secondarily by the balance of primary and secondary income. In the years that followed (2013-2015), the non-cyclical component of the trade balance came into play and supported a further adjustment in the actual current account. In the 2016-2019 period, the cyclically-adjusted trade balance hovered around -3.7% of GDP and the respective current account stood at -4.5% of GDP. The cyclical component gradually decreased and remained – on average – at 2.6% of GDP.

The highest current account deficit was recorded in 2008, amounting to EUR 36.6 billion, i.e. 15.1% of GDP (see Chart 1). The

Chart 3 Cyclically adjusted current account (2002-2019)



cyclical part of this deficit was 3.3% of GDP, with the consequent cyclically adjusted deficit of the current account reaching 11.8% of GDP (see Chart 3). In 2019, the current account deficit fell to 1.4% of GDP, recording an improvement of 13.7 pp of GDP since 2008. Of this improvement, 5.4 pp of GDP is attributed to cyclical factors and 8.3 pp to structural factors (see Chart 4). Therefore, 60% of the current account deficit correction can be attributed to structural factors, and the remaining 40% to cyclical factors (trading partners' and Greece's output gap). In greater detail, the improvement in the trade balance (goods and services) was 10.9 pp of GDP, almost equally distributed between the cyclical and the non-cyclical component. The improvement in the primary and secondary income balance, which by definition is structural, amounted to 2.8 pp of GDP.<sup>14</sup>

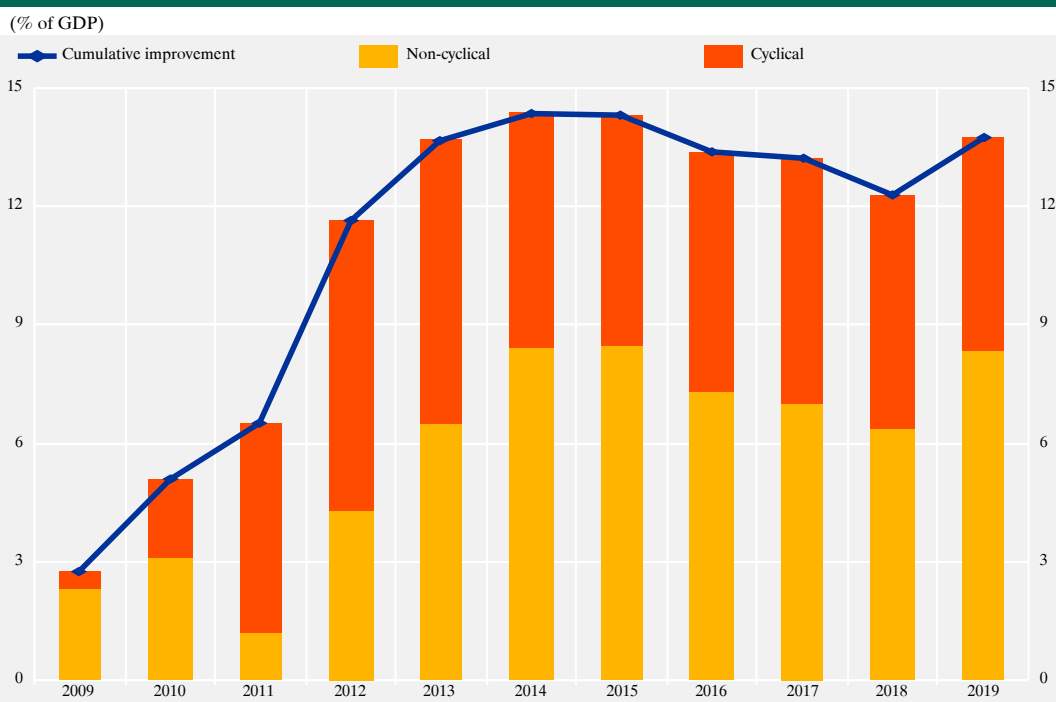
At this point, it would be useful to see how our results compare with the corresponding ones

of previous studies. First, Tressel and Wang (2014) estimated the current account adjustment decomposition for the 2007-2012 period for a number of euro area countries. In the case of Greece, cyclical factors (including output gap, financial conditions and commodity terms of trade) were estimated to have contributed 50% of the actual current account reversal during the above mentioned period.

The ECB (2014) estimated that, in the case of Greece, more than 50% of the current account adjustment in the 2008-2012 period was explained by cyclical factors. This outcome was based on the estimated output gaps by the IMF, the European Commission (EC) and the OECD and followed the first stream methodology described briefly in Section 3. Without prejudice to data revision (both current account and output gap) since 2014, the ECB's

<sup>14</sup> Even if the EU's AMECO database estimates for Greece's output gap are applied, the results are not significantly different (36% cyclical and 64% structural).

Chart 4 Cumulative correction of the current account since 2008



Source: Authors' calculations.

conclusion is in line with our analysis, which indicates that more than 60% of the cumulative adjustment could be attributed to cyclical factors in that period. The EC (2015) also supports that in the initial phase of the adjustment in the deficit countries, the current account deficit contraction was associated with reduced imports on the back of weakened domestic demand.

More recently, the IMF (2019) attempted to decompose the Greek current account adjustment into cyclical and structural factors by using the first stream methodology and utilising –to some extent– the IMF's EBA methodology. They considered as cyclical the output gap, the commodity terms of trade, the credit-to-GDP gaps and volatility (proxied by the VIX index), while structural factors included variables such as the cyclically adjusted fiscal balance, real unit labour cost (ULC), measures of the institutional and political environment, etc. They concluded that the

largest part of the deterioration in the current account between 2004 and 2008 was structural. For the 2008-2018 period, about 75% of Greece's current account correction was attributed to cyclical factors and the remaining 25% to structural factors and policies.

Our analysis, though, indicates that more than 50% of the cumulative adjustment for the 2008-2018 period can be attributed to non-cyclical factors. This discrepancy, apart from methodological differences, may partly reflect data revisions, both of current account data and of output gaps. It should also be noted that in Cubeddu et al. (2019) regarding the EBA 2018 update, the credit gap (i.e. the credit-to-GDP gap) is considered a policy variable rather than a cyclical factor as in the abovementioned research. Had the credit-to-GDP gap been included in the structural factors, the breakdown would have been different and definitely in favour of the structural adjustment.

## Sensitivity analysis with respect to income elasticity of exports and imports

(cumulative share of cyclical and non-cyclical adjustment in the current account deficit, 2008-2019)

Income elasticity of imports ( $\theta_M$ )	Income elasticity of exports ( $\theta_X$ )					
	1.0		1.5		2.0	
	cyclical	non-cyclical	cyclical	non-cyclical	cyclical	non-cyclical
1.0	26	74	27	73	27	73
1.5	39	61	40	60	40	60
2.0	52	48	52	48	53	47

Source: Authors' calculations.

## 5 SENSITIVITY ANALYSIS

In order to investigate the sensitivity of the results to the income elasticities of imports and exports, the current account balance adjustment was calculated for a range of elasticities (1.0-2.0) around the central value (1.5). The values of the elasticities are in line with a number of previous research endeavours (see Appendix B). The effect of the income elasticity of imports is greater than that of exports. Structural factors may account for 47%-74% of the current account deficit correction, depending on the elasticities used (see the table above).

Overall, as regards the trade balance, much of the improvement came from the significant recovery in exports, particularly after 2012, which, coupled with the almost zero output gap of trading partners' economies after 2016, was purely structural in nature.<sup>15</sup> On the other hand, the decline in imports was primarily cyclical, as a result of the decline in domestic demand and the emergence of a large negative output gap. However, to the extent that the prolonged recession also contributed to a decline in potential output, it helped reduce the cyclical portion of the overall adjustment. Finally, given the high import content of exports, the increase in exports also contributed to a rise in the structural share of imports.<sup>16</sup> More generally, the structural changes that took place in recent years in the Greek economy and the consequent shift, albeit gradual, towards a more extroverted growth model appear to be reflected in the sig-

nificant structural adjustment of the current account balance.<sup>17</sup>

## 6 CONCLUSIONS

Greece's external imbalances widened persistently in the lead-up to the 2008 financial crisis and have narrowed considerably afterwards, as the economy went through a major recession. The assessment of the relative importance of structural and cyclical factors in explaining the correction of current account balances is key in evaluating the future development of the external sector. In this paper we assessed the relative significance of structural and cyclical factors behind the considerable reduction of the Greek current account deficit and the analysis relied primarily on the methodology used by Haltmaier (2014). In particular, the cyclical part of the adjustment was estimated using alternative income elasticities of both imports and exports in line with the literature, while the structural part was calculated indirectly as the difference between the overall actual balance and the cyclical part.

Our analysis shows that the current account adjustment has in a considerable part been

<sup>15</sup> See for instance Bardaka and Papazoglou (2019) and Backinezos et al. (2019).

<sup>16</sup> For the participation of Greece in global value chains, see for instance Gibson et al. (2019).

<sup>17</sup> According to Bank of Greece estimates, over the 2010-2017 period (data availability), the volume of tradable goods and services recorded a cumulative increase of 14%, compared with non-tradables.

driven by structural factors, which account for 60% of the overall adjustment according to our baseline scenario. Therefore, most of the correction is of a permanent nature, which means that the relatively high deficits of the pre-crisis period are not expected to re-emerge any time soon. Our results are robust as they largely hold under alternative hypotheses regarding the income elasticities of exports and imports. That is, even though the deep recession that the country experienced has indeed contributed to the correction of the external imbalance, most of the adjustment was structural, reflecting a gradual shift in Greece's growth model. This has manifested itself to a significant extent in the fact that the country is turning into a more

open economy as a result of its enhanced export performance.

However, given the fact that a significant part of the adjustment came from cyclical factors and the high negative size of net international investment position, the above conclusions should not lead to complacency. On the contrary, persistent structural reforms aimed at enhancing the overall competitiveness of the Greek economy and shifting production towards tradable goods and services should remain among the main economic policy priorities. That is, targeted policy initiatives must be at the centre of the reform effort, as they are essential in sustaining the reduction of external imbalances over the medium term.

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## APPENDIX A

# CONSTRUCTION OF TRADE-WEIGHTED TRADING PARTNERS' GDP AND POTENTIAL GDP

Trading partners' GDP (potential GDP) was constructed as their trade-weighted GDP (potential GDP). We have used the export trade weights of Greece's main trading partners in manufactured goods, as defined in Sections 5 to 8 of the Standard International Trade Classification (SITC 5-8), i.e. excluding trade in services, agricultural products, raw materials and energy products. As data were available up until 2015, for the 2016-2019 period the trade weights refer to the last available observation (i.e. 2013-2015 period level). The trade weights, as calculated by the ECB, are based on bilateral data on trade in manufactured goods for the periods 1995-97, 1998-2000, 2001-03, 2004-06, 2007-09, 2010-12 and 2013-15, the last update having been made in 2017. The export trade weights were retrieved from the ECB Statistical Data Warehouse (key: WTS.A.GR.xx.Z0Z.X0.X.MAN.F). The aggregated trade share of the 32 countries used amounts to approximately 70% of Greek exports of manufactured goods (see Table A1). The selection of these countries was also driven by the availability of potential output data in AMECO or the IMF's WEO. The

methodology for the construction of the geometric weighted average of trading partners' GDP and potential GDP is similar to the one of the export demand index in Hubrich and Karlsson (2010).

GDP data were retrieved from the Eurostat website. AMECO potential GDP data (updated on 6 May 2020) were used, except for Australia, Canada, Japan and Norway. For these four countries, the IMF's October 2019 World Economic Outlook database was used, as the respective data were not available in AMECO. It should be noted that the April 2020 WEO database does not include potential output data, due to the high level of uncertainty in current global economic conditions.

Finally, trading partners' GDP and potential GDP, reflecting foreign demand and potential foreign demand, respectively, were chain-linked so as to avoid any changes stemming from the variation of the trade weights across periods (i.e. 1995-97, 1998-2000, 2001-03, 2004-06, 2007-09, 2010-12 and 2013-15).

**Table A1 Trading partners**

Euro area	EU – non-euro area	Non-EU
Austria	Bulgaria	Australia
Belgium	Croatia	Canada
Cyprus	Czechia	Japan
Estonia	Denmark	Norway
Finland	Hungary	United Kingdom
France	Poland	United States
Germany	Romania	
Ireland	Sweden	
Italy		
Latvia		
Lithuania		
Luxembourg		
Malta		
Netherlands		
Portugal		
Slovakia		
Slovenia		
Spain		



# APPENDIX B

## LONG-RUN ESTIMATIONS FOR INCOME ELASTICITIES OF EXPORTS AND IMPORTS

**Table B1 Exports**

Researcher	Foreign income elasticity	Estimation period	Dependent variable	Foreign income
Senhadji and Montenegro (1999)	2.81 (OLS and Phillips-Hansen's Fully Modified)	1960-1993	Real exports of goods and non-factor services	Weighted average of trading partners' GDP minus exports
Caporale and Chui (1999)	2.38 (DOLS); 2.10 (ARDL)	1960-1992 (annual data)	Export volumes of goods and services	Export shares-weighted GDP
Pain et al. (2005)	A unit income elasticity imposed	1982-2002 (quarterly data)	Export volumes of goods and services	Export market share (market share-weighted sum of partner countries' imports)
Sideris and Zonzilos (2005)	1.00 (supported by data)	1980:q1-2000:q4 (quarterly data)	Export volumes of goods and services	Weighted average of import volumes of main trading partners
Algieri (2014)	1.81 (range: 1.41-2.46) <sup>1</sup> (VECM)	1980:q1-2012:q3 (quarterly data)	Real exports of goods and services	– Corrected world GDP: real world GDP in USD adjusted for PPP – Foreign demand: weighted average of import volumes of main trading partners
Morin and Schweltnus (2014)	1.00 (imposed, but supported by data)	1992:q2-2012:q2 (quarterly data)	Export volumes of goods and services	Export market share (market share-weighted sum of partner countries' imports)
Christodouloupoulou and Tkačevs (2016)	0.91 (range: 0.43-1.45) <sup>2</sup>  0.93 (range: 0.87-0.98) <sup>2</sup>	2000:q1-2013:q1 (quarterly data)	Export volumes of goods  Export volumes of services	Geometric weighted average of trading partners' imports
Bragoudakis et al. (2016)	0.83 (Engle-Granger cointegration)	1980-2015 (annual data)	Export volumes of goods and services	Weighted average of import volumes of main trading partners
Bardaka (2017)	1.60 (Johansen cointegration)	2002-2017 (quarterly data)	Export volumes of goods and services	Trade share-weighted partner countries' GDP

1 The figure refers to the average estimated long-run elasticity of three alternative models. The foreign income elasticity was estimated at 2.46 when corrected world GDP was used and at 1.56 and 1.41 when foreign demand was used.

2 The figure refers to the average estimated long-run elasticities of a model with different Harmonised Competitiveness Indicators (HCI) based on CPI, CPI for Services, PPI, ULCM, ULCT and GDP deflators. Significant at the 1% and 5% level.

**Table B2 Imports**

Researcher	Domestic income elasticity	Estimation period	Dependent variable	Domestic income
Caporale and Chui (1999)	1.32 (DOLS); 1.58 (ARDL)	1960-1992 (annual data)	Import volumes of goods and services	Real GDP
Pain et al. (2005)	A unit income elasticity imposed	1982-2002 (quarterly data)	Import volumes of goods and services	Components of domestic demand
Sideris and Zonzilos (2005)	1.00 (imposed)	1980:q1-2000:q4 (quarterly data)	Import volumes of goods and services	Weighted sum of the import content of the domestic demand components
Morin and Schwellnus (2014)	1.62 <sup>1</sup>	1992:q2-2012:q2 (quarterly data)	Import volumes of goods and services	Components of domestic demand
Christodouloupoulou and Tkačevs (2016)	1.56 (range: 1.47-1.68) <sup>2</sup>  0.22 (range: -0.07-0.57) <sup>3</sup>	2000:q-2013:q1 (quarterly data)	Import volumes of goods  Import volumes of services	Private consumption + gross capital formation + government consumption
Bragoudakis et al. (2016)	1.0 (restricted); 1.23 (unrestricted) (Engle-Granger cointegration)	1980-2015 (annual data)	Import volumes of goods and services	Weighted sum of the import content of the domestic demand components
Bardaka (2017)	1.41 (Johansen cointegration)	2002-2017 (quarterly data)	Import volumes of goods and services	Real GDP

1 Based on the estimated impulse response for import volume generated by a 1% increase in total expenditure after 70 quarters (see Table A.7 therein).

2 The figure refers to the average estimated long-run elasticity of a model with different Harmonised Competitiveness Indicators (HCI) based on CPI, CPI for Services, PPI, ULCM, ULCT and GDP deflators. Significant at the 1% level.

3 The figure refers to the average estimated long-run elasticity of a model with different Harmonised Competitiveness Indicators (HCI) based on CPI, CPI for Services, ULCT and GDP deflators. Not significant at the 10% level.