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Structural and Cyclical Factors of Greece's Current Account Balances: A Note

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STRUCTURAL AND CYCLICAL FACTORS OF GREECE'S CURRENT ACCOUNT BALANCES: A NOTE

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Abstract

This note examines the relative importance of cyclical and structural factors in determining Greece's current account performance. I use a number of filters to remove the long-term component and isolate the cyclical factors. It is shown that for the last 15-years the structural component explains most of the variation in the current account. Cyclical factors show a small increase in importance during the economic crisis. Thus, for any improvement in the current account to become permanent emphasis should be placed, among others, on the adjustment of structural factors such as the development of import substitution and export promotion strategies and in finding ways to improve flows of trade-financing to exporting firms.

JEL- classification: C01, F14
Keywords: Cyclical factors, structural factors, current account performance, filtering methods

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1. Introduction

The Greek current account deficit has been widening during the last decade until 2008, when it reached €35 billion or 15.6% of GDP. Since then, and during the economic crisis, it improved and, in 2013, it recorded a surplus for the first ever time. The question that arises is whether this improving trend in Greece's current account may be reversed when economic activity regains momentum[1] and the extent to which this performance may be sustainable. To provide an answer we distinguish between cyclical and structural components of the current account performance and compare their relative importance. The adopted methodology applies a number of filters to remove the long-term component, leaving the remaining cyclical. We show that for the last 15-years the structural part is more important; cyclical factors have a larger effect during the economic crisis which was accompanied by an improvement in the current account. Nevertheless, structural factors during the crisis years have lost some of their importance. This finding attributes permanent elements to the improvement of the current account which is verified by the recently observed gain in competitiveness and changes in consumption and production patterns. Nevertheless, the inability of exporters to overcome financing problems, low import substitution with domestic production and the small improvement in export promotion continue to have a negative impact on the current account.[2] To the above negative effects we should add a number of structural and institutional problems along with a highly bureaucratic system. These need to be reversed or at least ameliorated to ensure sustainability of the recent current account improvement. The rest of the note is structured as follows: Section 2 provides a brief review of the relevant literature and the methodology used. Section 3 presents the extracted cyclical and structural components and discusses the results. Finally, section 5 includes the conclusions.

[1] Experience varies among other "catching-up" European economies. Net exports have declined in both Portugal and Spain during periods of strong growth. However, strong growth in Ireland in the 1990s was accompanied with a high net export surplus.

[2] There are transitory factors other than the ones mentioned above, such as the energy bill that have an uncertain bearing on the current account often unfavorable due to Greece's heavy dependence on imported energy.

2. Related literature and methodology

The theoretical literature explaining the determinants of the current account is often based on the identity of the current account being equal to the difference between domestic saving and investment.[3] Most researchers use this identity to determine the structural and the cyclical components of the current account. They usually observe the following steps: At first savings and investment functions with GDP and other key variables are estimated. Second, the full-employment GDP is substituted in the above equations and fitted values are stored. Third, these fitted values are put into the current account identity and an estimate of the full-employment current account is obtained. Usually, this is considered as the structural component of the current account. Then, the cyclical component is derived by subtracting the above value from the actual current account.

The above methodology has been adopted by the European Commission as well as the IMF. In an IMF study, Phillips et al. (2013) run panel regressions of the current account with regressors "traditional" fundamentals, financial factors, temporary factors (as the output gap) as well as policy-related variables to obtain the structural component stating that most of the variables operate through the saving channel. Salto and Turrini (2010) in a European Commission study provide a review of the methodologies used to estimate the long-term component of the current account and run panel regressions of the current account on economic fundamentals such as domestic absorption, savings or price variables. In the European Commission Winter 2014 Economic Forecast, the cyclical component of the current account is computed for the euro-area countries using the same methodology. It is inferred that in the euro area periphery (where most of attention should be paid due to the large deviations experienced in the past) the recent adjustment has been non-cyclical ensuring some permanence to it.[4]

OECD studies follow parallel approaches. For example in Cheung, Furceri and Rusticelli, (2010) the structural component is derived from fixed effects regressions of the current account on macroeconomic, financial and institutional fundamentals, while the cyclical component is found by removing the trend from the current account with a

[3] On the empirical side, there is a large number of contributions which estimate the impact of factors that influence these variables. They are among others the business cycle, the real exchange rate, the terms of trade or openness representing income and price effects. (Goldstein and Khan (1985) present a theoretical overview of this literature).

[4] However, Greece's adjustment is found to be more of a short-term nature mainly due to cyclical factors.

moving-average method and further regressing it on short-term variables such as output gaps, short-term interest rates and real effective exchange rates. According to them cyclical factors are partly responsible for the recent narrowing in current account balances but in the medium term structural factors play an important role in the evolution of global external imbalances. Ollinvaud and Schwellnus (2013) in their analysis estimate separately each current account component (non-oil trade balance, trade balance and balance of investment income) distinguishing between groups of deficit and surplus countries. They conclude that as far as the euro-area is concerned, structural reforms can play an important role in dampening the negative effects of a future economic expansion or a boom in the housing market.

In this note we employ an alternative methodology using less theory to disentangle the structural and cyclical parts of the current account. For the purposes of testing robustness, five different filtering methods are applied to the actual series to isolate the structural component. The cyclical component is derived as a residual. A conclusion regarding the sustainability of a deficit or a surplus is drawn comparing the relative importance of the two components.

3. Estimation of the cyclical and structural components of the current account

Imports have a strong correlation with economic activity in Greece responding more strongly during expansions than in contractions (see Bardakas 2013). Thus, positive growth even of a short-term nature would lead imports to increase having a negative effect on the current account.[5] Therefore, temporary cyclical factors influence the current account.

On the other hand, there are structural factors of a more permanent nature that drive current account fluctuations. These depend on the levels of economic development, demographic profiles, and structures of consumption and production, as well as whether cost, price and structural competitiveness are improving or otherwise. They may come about as a result of increases or decreases in productivity growth or

[5] For example, the current account deficit increased sharply and "exhibited high persistence" during the period of strong economic growth since 1999 (see Brissimis etal. 2010). During the recent slowdown it has improved reflecting mainly an import-reducing effect due to weak domestic demand.

lower or higher inflation differentials between Greece and the euro area resulting in exports continuously growing more than imports or the reverse leading to a sustainable improvement or deterioration in the current account.

To estimate the above two components we use annual data for the Greek current account for the period 1998-2013. First, the long-term trend of the current account is isolated applying five different filtering methods:[6] The Hodrick-Prescott filter and its one-sided version, the Baxter-King and the Christiano-Fitzerald forms of the band pass-filter and finally deviations from first-differences. These filters have the advantage of being simple to apply and they do not rely much on economic theory. The resulting variable is the structural part of the current account and contains a deterministic or stochastic trend.[7] If subtracted from the actual series it produces a series that is stationary the cyclical component:

Cyclical CA balances = Actual CA balances – Structural balances – Other temporary factors

Figures 1 and 2 present the estimated components together with the actual current account. During the whole period, all five cyclical current account estimates are above the actual value approaching it during the few last years. This shows that cyclical factors have become a relatively more important part of current account balances recently. On the other hand, the five structural components follow actual current account balances and become smaller after 2008. However, during that time they overestimate the actual series showing higher than actual deficits.

Table 1 presents the five components (cyclical and structural) as a percent of GDP, averaging over the sample period or over the last two years. The last row presents the average over the five filtering methods. This number averaging for the whole sample predicts a surplus of 0.4% while the actual current account as percent to GDP shows a deficit of 7.5%. Interestingly, for the last two years the cyclical surplus becomes even higher, at 8.5% of GDP. This finding indicates that cyclical factors have a significant contribution to the recent current account improvement. In the same table the structural component as a percent to GDP exceeds the actual current account by around 6.3%. For the last two years this difference is reduced to 5% providing an

[6] See the appendix for a brief review of these filtering techniques.
[7] See Yap(2003).

indication that some progress has been made in reducing negative structural effects.[8] Additional evidence that strengthens the above argument is offered by the observation that the 2012-13 average of the structural component as percent to GDP is lower by 8.3% compared with the whole sample average. Thus, one may safely argue that part of the recent current account improvement is also of long-term permanent nature.

The relative importance of each component in determining developments in the actual current account can be examined comparing the size of their correlations with the actual series. The first two columns of table 2 report these correlations for the whole sample. The stochastic series that incorporates the structural part of the external balance is able to track the actual current account with a correlation ranging between 0.80-0.96 (0.90 on average over the five filters), while the stationary cyclical component tracks the actual series with a lower correlation ranging between 0.4-0.9 (0.6 on average). That is the structural part is relatively more important than the cyclical if we refer to the whole sample. The last two columns present the same correlations over the years of the economic crisis. The average correlation of the cyclical component with the actual balance over the five methods increases to 0.82 indicating that the cyclical part of the balance has gained importance during that time. Structural factors are only 10 percentage points more important than cyclical factors with an average correlation of 0.92. Cyclical and structural elements are almost equally important when interpreting the recent current account surplus. However, current account dependence on cyclical elements is higher during the economic downturn. Almost half of its improvement is to a large extent due to low internal and external demand caused by the economic crisis. As a result, a future turnaround in the domestic economy will cause the current account to revert back to a deficit unless the structural changes required will have by that time been implemented thus safeguarding healthier preconditions that may guarantee sustainability of surpluses.

[8] This is verified by the results of the World Economic Forum's competitiveness report where Greece moved up 10 points this year in the competitiveness chart compared with 2013-14 indicating improvement in several areas such as the functioning of the goods markets and more flexibility in the labor market. However, Greece still ranks among the lowest countries of the European Union concerning competitiveness. This can be attributed to weaknesses in a number of areas such as the institutional system, the quality of the educational system, the need for higher investment in research and development and a problematic macroeconomic environment where structural reforms need to be implemented to bring about further improvement.

4. Conclusions

In this paper we show that Greece's external position during the last fifteen years is to a large extent explained by structural factors and to a smaller extent by cyclical factors. We also find that cyclical and structural factors with almost equal importance have contributed to the recent improvement in the Greek current account. Further, the structural part that represents the underlying long-term trend of the current account for the last two years of the sample period shows a deficit of almost 6% of GDP in contrast to the cyclical part which suggests a surplus of 8.5% of GDP. This figure, however, is dramatically reduced in entire-sample estimation.

Given, therefore, the significance of the cyclical short-term dynamics in recent years the imminent recovery of the domestic economy must be counterbalanced by structural factors. Factors such as labour and product market liberalization, a reduction in public bureaucracy and export promoting policies (like encouraging exporters access to liquidity) are important given the slow response of exports to the recent improvement in cost and price competitiveness (see Bower, Michou and Ungerer 2014). According to Bower et al, inefficiencies in the Greek institutions create a "non-price competitiveness gap" responsible for the above slow response. Thus, structural reforms like those mentioned above will contribute to the sustainability of the recent current account improvement.

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Table 1: Component Averages				
	1998-2013		**2012-2013**	
Actual current account % GDP	**-7.6%**		**-0.7%**	
Filter	**Structural CA % GDP**	**Cyclical CA % GDP**	**Structural CA % GDP**	**Cyclical CA % GDP**
Hodrick-Prescott	-12.6	0	-5.1	9.6
Hodrick-Prescott one-sided	-14.7	2.2	-7.2	12.1
Baxter-King	-15.9	-0.6	-	-
Christiano-Fitzerald	-12.8	0.2	-5.3	3.1
First Difference	-12.7	0.1	-5.1	9.3
Average	**-13.8**	**0.4**	**-5.7**	**8.5**

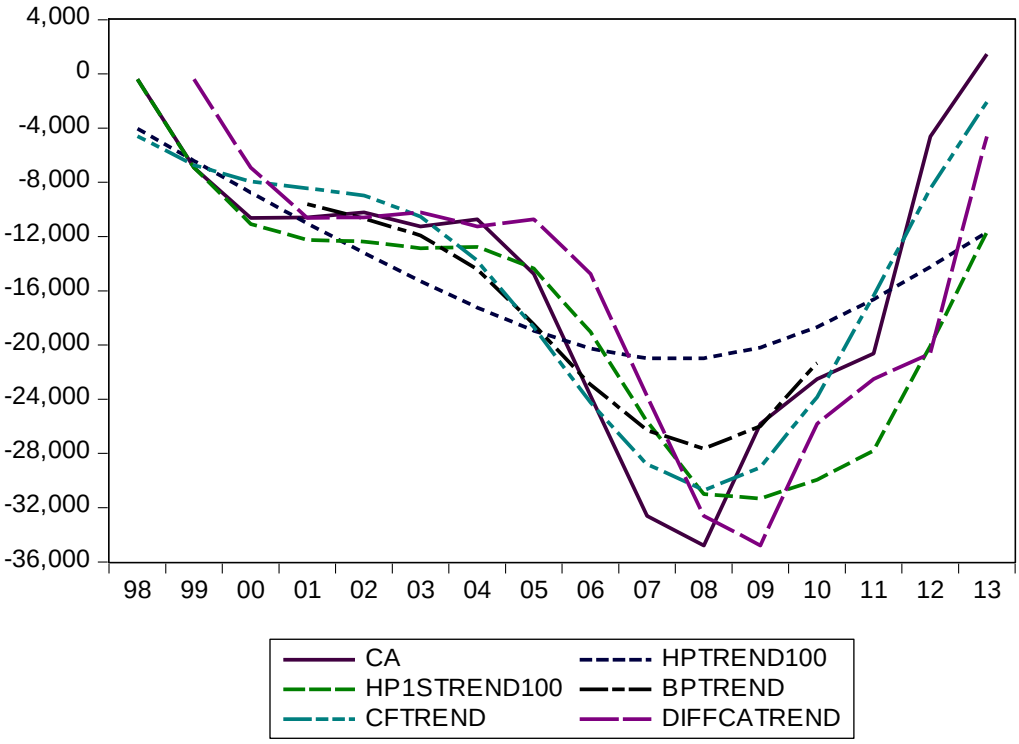
Note: Annual data is used. The smoothing parameter of the Hodrick-Prescott filter is set to 100.The Baxter-King and Christiano-Fitzerald filters were set to preserve components of the data for the period between 2 and 8 years. CA stands for current account.

Table 2: Correlation Coefficients between the structural and cyclical current account components and the actual current account				
	1998-2013		**2008-2013**	
Filter	**Structural w/ actual**	**Cyclical w/ actual**	**Structural w/ actual**	**Cyclical w/ actual**
Hodrick-Prescott	0.809	0.899	0.974	0.997
Hodrick-Prescott one-sided	0.829	0.506	0.943	0.922
Baxter-King	0.952	0.809	0.864	0.906
Christiano-Fitzerald	0.961	0.529	0.968	0.650
First Difference	0.788	0.353	0.891	0.634
Average	0.868	0.619	0.928	0.821

Note: See note of Table 1.

Figure 1

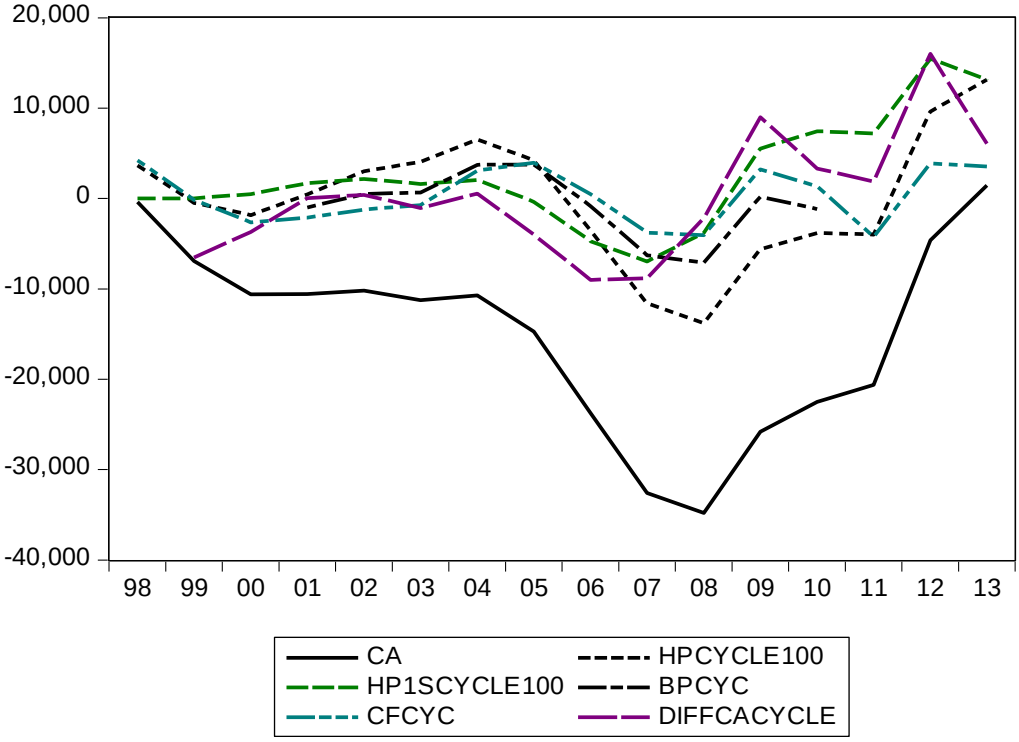
The Current Account and its Structural Component based on five filters



Note: HPTREND100 uses the Hodrick-Prescott filter, HP1STREND100 uses the one-sided Hodrick-Prescott filter, BPTREND uses the Baxter-King filter, CFTREND uses the Christiano-Fitzerald fliter and DIFFCATREND uses first differences.

Figure 2

The Current Account and its Cyclical Component based on five filters



Note: HPCYCLE100 uses the Hodrick_prescott filter, HP1SCYCLE100 uses the one-sided Hodrick-Prescott filter, BPCYC uses the Baxter-King filter, CFCYC uses the Christiano-Fitzerald fliter and DIFFCACYCLE uses first differences.

APPENDIX

A brief overview of the filtering techniques used.

1. The standard two-sided Hodrick-Prescott filter.

The Hodrick-Prescott (HP) filter is one of the best known techniques used in macroeconomics to separate the cyclical component of a time series from its long-term trend. It minimizes the variance of departures of the actual series from its growth (trend) (the cyclical component) subject to a penalty for the variation in the rate of growth of the trend (changes in the curvature or otherwise smoothness of the trend series):

$$\sum_{t=1}^{T}(x_t - g_t)^2 + \lambda \sum_{t=2}^{T-1}[(g_{t+1} - g_t) - (g_t - g_{t-1})]^2$$

In matrix form the minimization least square problem is:

$$(X - G)'(X - G) + \lambda G' K' K G$$

where $X = (x_1,...x_T)'$, $G = (g_1,...g_T)'$ and

$$K = \begin{bmatrix} 1 & -2 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & -2 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & -2 & 0 & 0 & 0 & 0 \\ . & . & . & . & . & . & . & . \\ . & . & . & . & . & . & . & . \\ . & . & . & . & . & . & . & . \\ 0 & 0 & 0 & 0 & 0 & 1 & -2 & 1 \end{bmatrix}$$

A larger value of the parameter λ generates a smoother trend. As λ approaches infinity the trend component corresponds to a linear time trend. λ is not determined through the optimization procedure and is set arbitrarily as a rule of thumb. This is a drawback given that the calculation of the filter is very sensitive to the values λ takes.

The solution is a linear transformation that removes the trend component:

$$G(I_T + \lambda K'' K)^{-1} X$$

The remaining is a detrended cycle series.

2. One-sided version of the Hodrick-Prescott filter.

The two-sided HP filter uses the future and past values to construct time point t. This introduces the "end point bias problem", highly unreliable estimates of the trend at the end of the time period. The one-sided version of the HP filter does not use in the detrending operation future values of the series but only past values.

3. The Baxter-King form of the Band-Pass filter.

The Baxter-King (1995) (BK) filter similar to the HP filter removes the trend from the actual series and generates the cyclical component. Baxter and King propose a finite moving average approximation of an ideal band-pass filter based on Burns and Mitchell's (1946) definition of a business cycle. It is designed to pass-through components of time series with fluctuations between 1.5 and 8 years (for annual data) that represent the cyclical component, removing low and high frequencies. This is an improvement compared to the HP filter that removes only low frequencies producing a filtered series that contains high frequencies.

When applied to annual data the BK filter is a linear filter that takes the form of a K-year symmetric (i.e., $B_{t,h}=B_{t,-h}$) time invariant (i.e., $B_{t,h}=B_h$) moving average:

$$y_t^f = \sum_{h=-K}^{K} B_{t,h} y_{t-h} = B(L) y_t ,$$

where L is the lag operator.

The set of weight coefficients $\{B_h\}$ is obtained by solving the minimization of the following mean squared error imposing symmetry and stationarity restrictions.

$$\min E\{(y_t - y_t^f)^2\}$$

The solution takes the form:

$$B_h^f = B_h - \frac{1}{2K+1} \sum_{n=-K}^{K} B_n$$

The BK filter has many desirable properties. First, since it is symmetric it does not introduce phase shifts and leaves the extracted components unaffected except for their amplitude. Second, being of constant finite length and time invariant the filter is stationary. However, there is a drawback: Filtering using moving averages in the time domain implies the loss of 2K data values.

4. The Christiano-Fitzerald form of the Band-Pass filter.

The Christiano-Fitzerald is the most general form of the band-pass filter where the weights on the leads and lags are time varying and asymmetric being different for each observation. The advantage of this filter is that since it is not fixed length and it does not use a fixed number of leads and lags it does not lose observations at the beginning and end of the sample and can be computed to its ends.

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