

# Cyclically Adjusted Current Account Balance of Turkey

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# Cyclically Adjusted Current Account Balance of Turkey\*

Okan Eren Gülnihal Tüzün

## Abstract

We estimate the impact of the domestic and trade partners' business cycles on the current account balance of Turkey and build a cyclically-adjusted current account balance from 2003Q1 to 2019Q1. To this end, we adopt a methodology that is based on the estimation of domestic and foreign business cycles by a modified version of HP filter and the approximation of their impact on the goods and services trade balances, separately. Our findings suggest that the level and evolution of the current account balance are mainly determined by non-cyclical factors although the size of cyclical adjustment reaches up to 1.4 percent of GDP in certain periods. The domestic business cycles seem to be the main driver of the cyclical changes in the current account balance throughout the period of analysis. Furthermore, the cyclical adjustment is more pronounced in the goods trade balance than the services trade balance. Foreign business cycles have a much bigger effect on the services trade balance than the goods trade balance when compared to the impact of domestic business cycles. Finally, the incorporation of price cycles into the analysis points out that the final cyclically-adjusted current account balance turns out to be more positive in recent periods unlike the case in which only the business cycles are taken into account.

**JEL Codes:** E32, F14, F32

**Keywords:** Current Account Balance, Cyclical Adjustment, Business Cycles

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## **Non-Technical Summary**

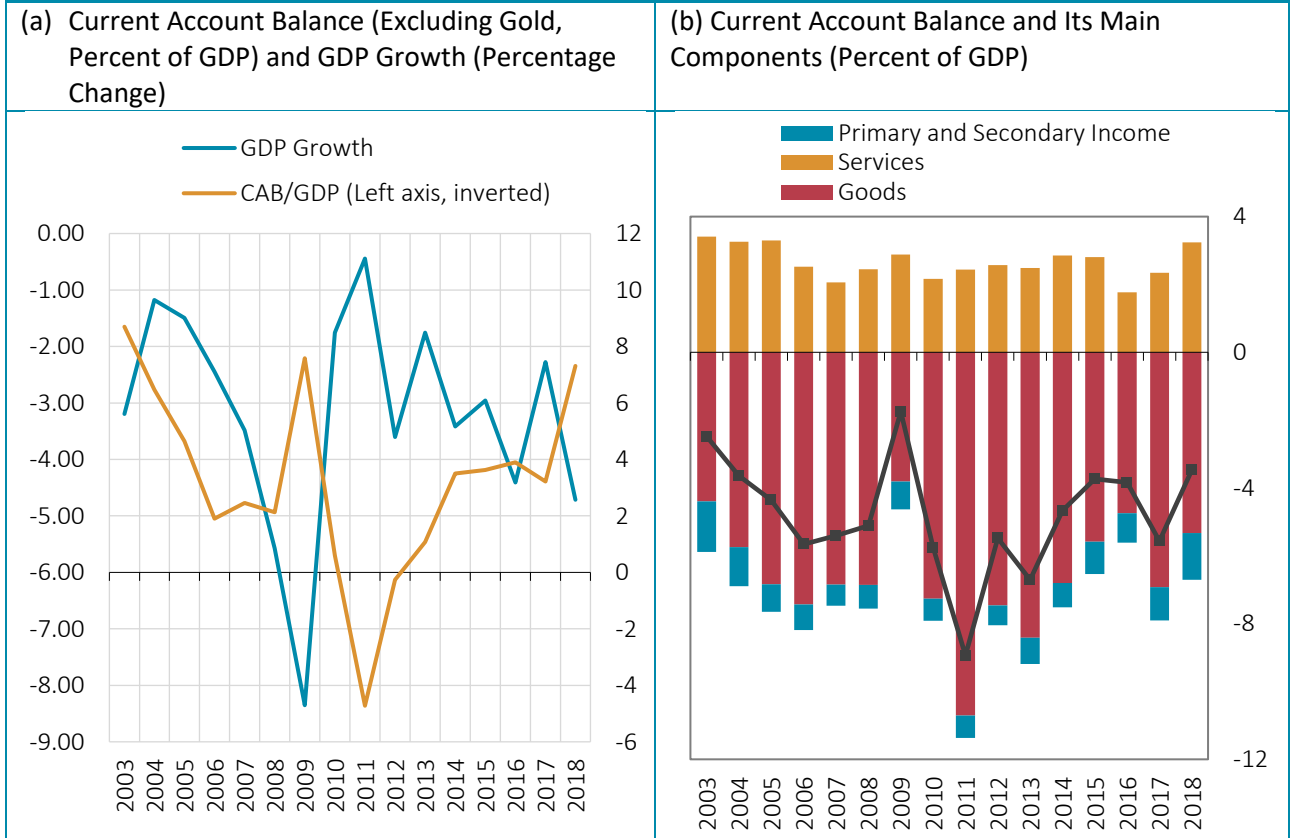
The foreign trade balance, or more broadly the current account balance, of Turkey is deeply affected by the cyclical movements observed in domestic and world income. It is of vital importance for policy makers to quantitatively decompose the sources of the change in current account balance into cyclical and non-cyclical factors. In this study, we analyze the impact of the domestic and foreign business cycles on current account balance of Turkey and estimate the cyclically adjusted current account balance from 2003 to 2018. To this end, we employ a modified version of the widely used Hodrick-Prescott (HP) filter to identify both the domestic and foreign business cycles and investigate their impact on goods and services trade, separately. According to our findings, the level and the historical development of the current account balance are mainly determined by non-cyclical factors despite a sizeable impact of business and price cycles. The size of the cyclical adjustment varies between -1.4 and 1.4 percent of GDP throughout the sample period. Our findings also suggest that the cyclical adjustment in the goods trade balance is much greater than the one in the services trade balance and the domestic business cycles have a dominant role in shaping the evolution of current account balance. Moreover, after taking the price cycles into account, the cyclically-adjusted current account balance turns out to be more positive signaling the supportive role of prices in recent periods.

## 1. Introduction

In order to engage in an optimal policy design for the objective of arriving the external equilibrium, it is of vital importance for policy makers to monitor both the external and internal dynamics relevant for the domestic economy. In this regard, various approaches are aimed at reaching a current account balance measure which can reflect either a sustainable level of external balance or a level which is in line with the economic fundamentals driving the savings-investments rationale for the current account balances. In order to quantify the importance of cyclical fluctuations on the Turkish current account balance, we estimate the impact of the domestic and trade partners' business cycles on the current account balance of Turkey and build a cyclically-adjusted current account balance from 2003Q1 to 2019Q1. To this end, we adopt a methodology that is based on the estimation of domestic and foreign business cycles by a modified version of HP filter and the approximation of their impact on the goods and services trade balances, separately.

As the Figure 1.1.a demonstrates that, the historical path of the ratio of the current account balance of Turkey to the output level displays quite a volatile pattern for decades. For instance, it had run a steadily widening deficit until 2008 when it reached to its maximum before the global financial crisis (Figure 1.1a). During the global crisis, the slowdown of domestic economy led to a significant improvement in the current account balance despite the big fall in the goods exports due to the weakened global demand (Figure 1.1b). Although the current account balance is mainly determined by some structural factors such as the production technologies, consumer preferences as well as the fundamental policy frameworks, there are also cyclical factors that seem to have a big impact on the path of the current account balance. As this external balance measure can not be considered in isolation from the variations in the business and price cycles, the oscillations of both the demand and price measures from their long-run trends are of capital importance for an accurate assessment of the external balances.

**Figure 1.1: Current Account Balance Figures for Turkey**



This raises the questions of to what extent the fluctuations in the current account balance can be attributed to the global and domestic cycles and what the level of the current account would be if the deviations due to the domestic and global cycles are removed. In this paper, we aim to remove the impact of domestic and global business cycles as well as the cycles prevalent in the prices on the current account balance, and hence to estimate the cyclically-adjusted current account balance. Quantifying the degree to which the cyclical factors affect the external adjustment process is a crucial step in policy making especially when choosing between the policies encompassing structural reforms and the policies that would counteract the temporal developments associated with business cycles.

There are mainly three different approaches regarding the long-term level of the current account: One of them is a current account estimate which is consistent with the fundamentals of the economy (the macroeconomic balance approach), another is a net foreign assets position stabilizing level (the external sustainability approach), and the last one encompasses the removal of the component of the current accounts that is related to the domestic and global business cycles (cyclical adjustment approach). While the majority of the studies in the literature rely on the first two approaches, in this study we aim at building a framework about the cyclical adjustment of the current account balance in Turkey through the lens of a trend-cycle decomposition approach.

To account for the fluctuations associated with business cycles in the current account, we adopt a methodology that is built upon the estimation of domestic and foreign business cycles by a modified version of commonly used HP filter, which is proposed by Hanif, Iqbal and Choudhary (2017), and the separate estimations of their impact on the goods and services trade balance by employing the appropriate long-run income elasticities. Our findings suggest that the behavior of current account balance of Turkey from 2003Q1 to 2019Q1 is principally shaped by the non-cyclical factors mainly through the goods trade balance despite the substantial impact of both domestic and foreign business cycles on the current account balance. The overall cyclical adjustment varies from -2.1 to 1.4 percent of GDP with negative values implying cyclical improvement and positive values cyclical deterioration in current account balance while the adjusted current account balance moves between -0.5 and -9 percent of GDP. The cyclical adjustment in the goods trade balance is found to be much bigger than the services trade balance and the domestic business cycles seem to constitute the bulk of the cyclical movements. Moreover, our findings show that in the only two periods, the first quarter of 2009, the last quarter of 2018 and the first quarter of 2019 when the unadjusted current account balance becomes positive, the balance changes to negative when the cyclical components are eliminated. When we additionally adjust the current account balance for the price cycles, it is found out that the adjustment due to price cycles is positive and greater in size than the negative business cycle adjustment. This in turn leads to the final cyclically-adjusted current account balance to be more positive unlike the case in which only the business cycles are taken into account. Therefore, we conclude that the contribution of the export and import price cycles to the cyclically-adjusted current account balance is substantial.

Although the studies related to the cyclical adjustment of current account for Turkey have quite limited space in the literature, our findings are mostly in line with those of the previous studies such as Bénassy-Quéré et al. (2008) and Kara and Sarıkaya (2014). They both use annual data but covers different time periods. The former reaches estimates for the year 2005 while the latter covers the period between 2003 and 2012. Our paper differs from them by using a higher frequency, quarterly, data and covering the most recent years. Unlike those papers, we adjust the services trade balance for both domestic and global business cycles separate from the goods trade balance and in this regard contribute to the literature.

The rest of the paper is structured as follows: Section 2 provides a review of the literature regarding the cyclical adjustment of the current account balance by introducing various fundamental approaches. The data and the methodology used in this paper are presented in Section 3. Section 4 reports our findings and provides a detailed discussion about them. Then, Section 5 concludes the paper.

## 2. Literature Review

The cyclical adjustment approach is a trend-cycle analysis of macroeconomic imbalances such that it isolates the portion of the current account balance that depends on both domestic and foreign cycles. In a narrower sense, the logic is to calculate a cyclically-adjusted current account balance which is essentially the level of external balance that would prevail if the business cycles were removed (Fabiani et al. 2016). The pioneering study of Hooper and Tyron (1984) addressed the question of “how the current accounts of the United States, Japan and Germany would differ if the cyclical portions of their output levels are eliminated?” They use the Multicountry Model of the Federal Reserve and it is based on some projected baselines as well as the cyclically neutral paths of the output levels. Certain studies focusing on the cyclical adjustment of the current account balances followed this method such as Haltmaier (2014) for a group of countries, Fabiani et al. (2016) for Italy, Afonso and João Tovar(2019) for Euro area economies, and Kara and Sarıkaya (2014) for Turkey.

Kara and Sarıkaya (2014) focus on extracting the cyclical components of both the foreign and domestic demand and the foreign prices from the current account in Turkey using the respective elasticities of each component. In this respect, they did not only address the business cycles but also other drivers of the current account which can be classified as a group of conjectural factors. They found that for the last decade there is a structural deterioration in the current account balance of Turkey which can not only be explained by the cyclical factors. Indeed, they pointed out that recently the main trend of the current account deficit is around 5 percent (of GDP). Kara and Sarıkaya (2014) show that the current account deficit tends to stabilize around 4.5-5 % (of GDP) over the sample period. We have found that the cyclically adjusted current account deficit, over the same estimation period with their study, is approximately 4.8%. When calculated until the end of the 2018, the cyclically adjusted current account deficit is found to be 4.7%.

Our study differs from Kara and Sarıkaya (2014) on the following grounds: i. Our data is at quarterly frequency rather than annual to better identify the cyclical portions of the current account balance in each quarter. ii. When estimating the long-run trends of domestic GDP and export-weighted global GDP, we benefit from a Fully Modified Hodrick-Prescott (FMHP) filter that is introduced by Hanif, Iqbal and Choudhary (2017) to alleviate widely criticized shortcomings associated with the standard Hodrick-Prescott (HP) filter. Employing the FMHP filter in terms of modifying the endogenously chosen smoothing parameter and of the correction of the end point bias on the contrary to standard HP filter enables us to provide more accurate cyclically adjusted current account balance of Turkey that is free from the deficiencies of HP filter. iv. We also treat goods and services trade balances separately to provide additional information on the sources of cyclical component of current account balance.



Among many methods, the most popular one is Hodrick and Prescott (1997) filter (aka HP filter). Despite the fact that this filter is easy to implement as it is embedded in almost all of the widely used software packages, it has two major issues: exogenously given smoothing parameter and end point bias (EPB) (Hamilton, 2018). In an attempt to resolve those issues simultaneously, Hanif, Iqbal and Choudhary (2017) introduces a methodology that consists of an endogenously gauged weighting scheme that reduces a loss function and endogenously determined smoothing parameter. They incorporate the Modified HP Filter approach of the McDermott (1997) who solved the fixed smoothing parameter inherent in the standard HP filter, with the loss function minimization approach of the Bloechl (2014) who addressed the EPB issue. Bloechl (2014) dealt with the EPB issue by introducing a flexible penalization to reduce the excess variability observed at the terminal observations of a time series. As it requires the endogenous lambda scheme, Hanif et al. (2014) complements his study with that of McDermott (1997) so that it is coined to the literature as *fully* modified HP (FMHP) filter. Because Hanif et al. (2014) provided evidence that FMHP outperforms the conventional filters we prefer to adopt FMHP filter as our baseline choice to isolate the trend components of domestic and export-weighted global GDP. Moreover, when the standard HP and the FMHP Filters are compared, as the most of the contribution of the latter is attributed to the terminal points of the series, we rely on the utilization of the FMHP Filter throughout the analysis.

The findings of the papers that employ two approaches in the literature related to the Turkish economy is outlined in Table 3.1. The rest of the paper is structured as follows. The next section provides the methodology we followed for the cyclical adjustment of the current account balance in Turkey. Section 4 presents and discusses the findings for the period under estimation in the paper. Section 5 provides a robustness analysis and Section 6 concludes the paper.

Table 3.1: Related Literature for Turkey		
Authors	Methodology	Current Account Deficit* (Percent of GDP)
Bénassy-Quéré et al. (2008)	Cyclically Adjusted Current Account Balance	4.6 (2005)
Kara, Sarıkaya (2014)	Removal of Cyclical and Conjunctural Factors	4.3 (2012)

The years in paranthesis denotes the year for which the trend current account deficit belongs. Current account deficits are expressed as a ratio of GDP.

### 3. Methodology and Data

Current account balance along with trade balance is affected by a country's own business cycle and its trading partners' business cycles. It typically moves against domestic business cycles in the sense that it improves during a cyclical downturn as the demand for imported goods and services becomes weaker and deteriorates during a cyclical upturn whereas it moves along with its trading partners' business cycles. When removing the cyclical portion of the current account balance, first its components that are closely related to domestic and global business cycles need to be determined. In general, export volumes are highly sensitive to the global income changes and therefore to global business cycles while the import quantities are mainly shaped by the domestic income movements. In case of prices, we assume that prices are not affected from business cycles, whether global or domestic, and evolve according to their own dynamics or perhaps own cycles. In other words, the cyclically adjusted current account balance would be the one that would arise if both domestic and global output gaps shrink to zero. Following the common practice in the literature, as an initial exercise, we only focus on the goods and services trade balances and do not attempt to correct the cyclical movements in the current transfers under the current account balance. Therefore, as a caveat, our cyclically adjusted current account balance is the sum of cyclically corrected goods and services trade balances and unadjusted current transfers.

Our baseline cyclical adjustment methodology is based on the long-run cointegrating relationship between a real variable,  $Q$ , and the real income,  $Y$ .<sup>1</sup> Here, we do not rule out the fact that quantity may also depend on the relative prices or real exchange rate, and hence we actually include those relevant variables conditional on their statistical significance when estimating the long-run relationships. A typical long-run relationship is given by

$$\ln Q = c + \beta \ln Y + \gamma \ln P \quad (3.1)$$

where  $Q$  stands for either exports volume or imports volume,  $Y$  measures the domestic or global real gross domestic product (GDP), and  $P$  is a vector of other relevant variables, in most of the cases the relative price variables.<sup>2</sup> The coefficient of real GDP is commonly interpreted as the income elasticity of the quantity variable. Since we are only interested in correcting for the impact of business cycles on the exports or imports volume, we basically ignore the vector of other variables,  $P$ , in the rest of our derivations to keep the exposition as simple as possible. In doing so, we discard the possible

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<sup>1</sup> The European Commission (EC) uses this methodology to adjust the current account balance for cyclical changes. Fabiani et al. (2016) also base their estimates on the same methodology. It would be good to provide some other papers that use the same methodology or a variant of it.

<sup>2</sup> For expositional simplicity, we do not distinguish between exports and imports and between global and domestic income at this stage.

secondary effects of business cycles on the quantities of exports or imports which work through the relative prices.<sup>3</sup>

We define the cyclical component as a deviation from the potential or trend component of a variable as follows

$$q = Q - \Delta Q \quad (3.2)$$

where  $q$  is the trend component and  $\Delta Q$  is the cyclical deviation. As a convention, we use lowercase variables for the trend components in the rest of the paper. Equation 3.2 can be rewritten as shown below

$$q = Q \left( 1 - \frac{\Delta Q}{Q} \right) \quad (3.3)$$

where  $dq = \frac{\Delta Q}{Q}$  is the percentage deviations from the long-run trend. After ignoring the variables other than income in Equation 3.1 and assuming that imports are iso-elastic to domestic GDP and exports are iso-elastic to trading partners' GDP (thereby constant elasticity assumption), percentage deviations from  $q$  are expressed as

$$dq = \frac{\Delta Q}{Q} = \beta \frac{\Delta Y}{Y} = \beta dy \quad (3.4)$$

where  $dy$  represents the output gap as a percentage of potential GDP. Then, plugging this into Equation 3.3 leads us to the following expression,

$$q = Q \left( 1 - \frac{\beta dy}{1 + \beta dy} \right) \quad (3.5)$$

which produces the cyclically adjusted export or import quantities.

Once the export and import quantities are adjusted for the cyclical ups and downs in domestic and foreign GDPs, the adjusted exports and imports are basically obtained by multiplying those quantities by the corresponding prices or price indices. In case of exports and imports of goods, we exclude unprocessed non-monetary gold trade while adjusting them for the variations induced by the domestic and foreign business cycles. We exclude the unprocessed gold from the adjustment process mostly because its imports and exports are too volatile to be explained by a sound statistical model. The cyclically adjusted exports and imports excluding gold along with the adjusted goods trade balance are displayed below

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<sup>3</sup> Apart from a discussion of whether business cycles have an impact on the real exchange rate or a similar relative price measure, the relative price variable has its own long-term trend and deviations from it. As a caveat, we assume away the impact of relative price cycles on the current account balance by ignoring the relative price variable in the long-run relationship.

$$x^{eg} = PX^{eg}qx^{eg} \quad (3.6)$$

$$m^{eg} = PM^{eg}qm^{eg} \quad (3.7)$$

$$tb^{eg} = x^{eg} - m^{eg} \quad (3.8)$$

where  $eg$  superscript stands for excluding gold and indicates that the variable excludes unprocessed gold;  $PX^{eg}$  and  $PM^{eg}$  are the prices of exported and imported goods, respectively, excluding gold; and  $qx^{eg}$  and  $qm^{eg}$  are the adjusted export and import volumes, respectively; and  $tb^{eg}$  is the cyclically-adjusted goods trade balance. Cyclically adjusted services trade balance,  $stb$ , can be easily obtained in a similar manner. Finally, cyclically adjusted current account balance in period  $t$  is given by

$$cab_t = tb_t^{eg} + stb_t + TB_t^g + CT_t \quad (3.9)$$

where  $TB_t^g$  refers to unadjusted gold trade balance in period  $t$ ,  $CT_t$  is the unadjusted current transfers item under the current account balance. So, our adjusted current account balance contains unadjusted items but their impact on the current account balance is small comparing to that of the adjusted items.

Our data covers the period from 2003Q1 to 2019Q1 and is obtained from two main sources: the Central Bank of the Republic of Turkey (CBRT) and Turkish Statistical Institute (TURKSTAT). We use CBRT balance of payments (BoP) data for exports and imports of goods and services, and current transfers in US dollars. When producing export and import volume indices for goods trade, we resort to the export and import unit value indices published by TURKSTAT despite the fact that nominal exports and imports according to the BoP definition differ from the one used by TURKSTAT.<sup>4</sup> When obtaining the real services exports, the services consumer price index (CPI) is employed after converting it into US dollars. In case of services imports, we prefer to use the unit value index for the European Union (EU) services exports given the considerable share of the EU in Turkey's services imports.<sup>5</sup> Last, the current transfers, both exports and imports, are corrected for price changes by the headline CPI series. Finally, all real series are adjusted for seasonal and working day effects and then multiplied by the relevant price indices to get the seasonally and trading day adjusted nominal series.

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<sup>4</sup> Even though the BoP trade data is essentially based on the data published by TURKSTAT, it is adjusted for some coverage and classification differences. For instance, according to BoP definition, exports include shuttle trade figures which are estimated based on a survey whereas the data published by TURKSTAT, which is accumulated from the records of the Customs Office, does not cover this type of information.

<sup>5</sup> Because of the lack of published price series for the services imports of Turkey, we have to choose a price index from among the publicly available price indices that are closely related to prices of imported services. So, there are several options such as the unit value index of EU services exports, EU CPI, world CPI, and world services CPI.

<b>Table 3.1: Long-Run Income Elasticities</b>		
	Imports	Exports
Goods Excluding Unprocessed Gold	1.25	2.17
Services	1.28	1.35

At this stage, the only missing part in our cyclical adjustment approach is the long-run income elasticities of export and import quantities. To get those elasticities, Equation 3.1 is estimated by using ordinary least squares. The findings are summarized by Table 3.1.6 In all regression equations export (import) volume is regressed on trade partners' real income (domestic real GDP), CPI-based real exchange rate and a constant. Only for the goods exports, the real exchange rate is left out because its estimated coefficient is statistically insignificant with a positive sign without any economical explanation or intuition.<sup>7</sup> To capture the developments in the GDPs of Turkey's export partners, the export-weighted global income index from Eren and Yavuz (2019) is used.<sup>8</sup> All series are found to be integrated of order 1, I(1), and no residual unit root is detected in any of the estimated models.

## 4. Results

### 4.1. Baseline Findings

In our approach, domestic and global output gaps are exogenously given, and thus we first need to choose an appropriate method to decompose real income series into their trend and cyclical components. As mentioned earlier, FMHP filter of Hanif, Iqbal and Choudhary (2017) reduces the end-point bias inherent in the original HP filter and endogenously determines the smoothing parameter based on the characteristics of the series. Therefore, we adopt FMHP filter as our baseline methodology to isolate the trend components of domestic and export-weighted global GDPs.

In general, output gap estimates are subject to some degree of variability depending on the choice of detrending technique. The domestic and export weighted output gaps from HP and FMHP filters are given by Figure 4.1 along with the domestic output gap estimate of the CBRT.<sup>9</sup> The

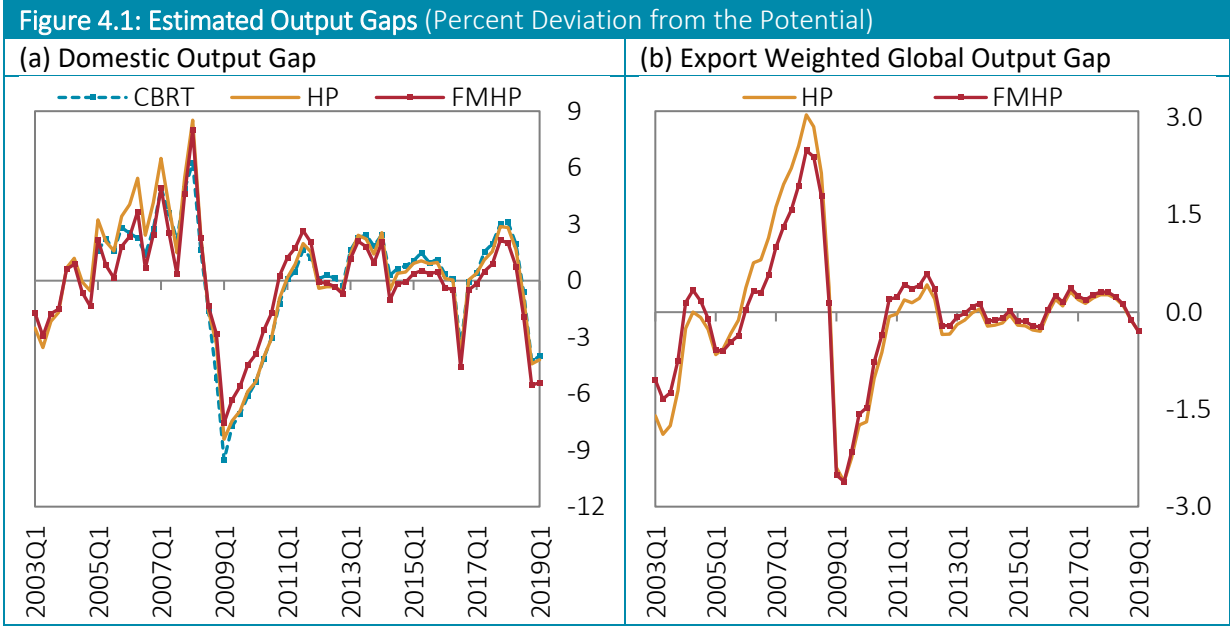
<sup>6</sup> See Table 5.1. in Robustness Analysis section for a more detailed exposition of long-run relationships.

<sup>7</sup> Even if the real exchange rate is included as an explanatory variable, the long-run income elasticity of goods exports excluding gold shows very little change from 2.18 to 2.21.

<sup>8</sup> This index includes around 110 countries with an export coverage ratio above 90 percent.

<sup>9</sup> Output gap estimates of the CBRT are taken from Inflation Report 2019-III.

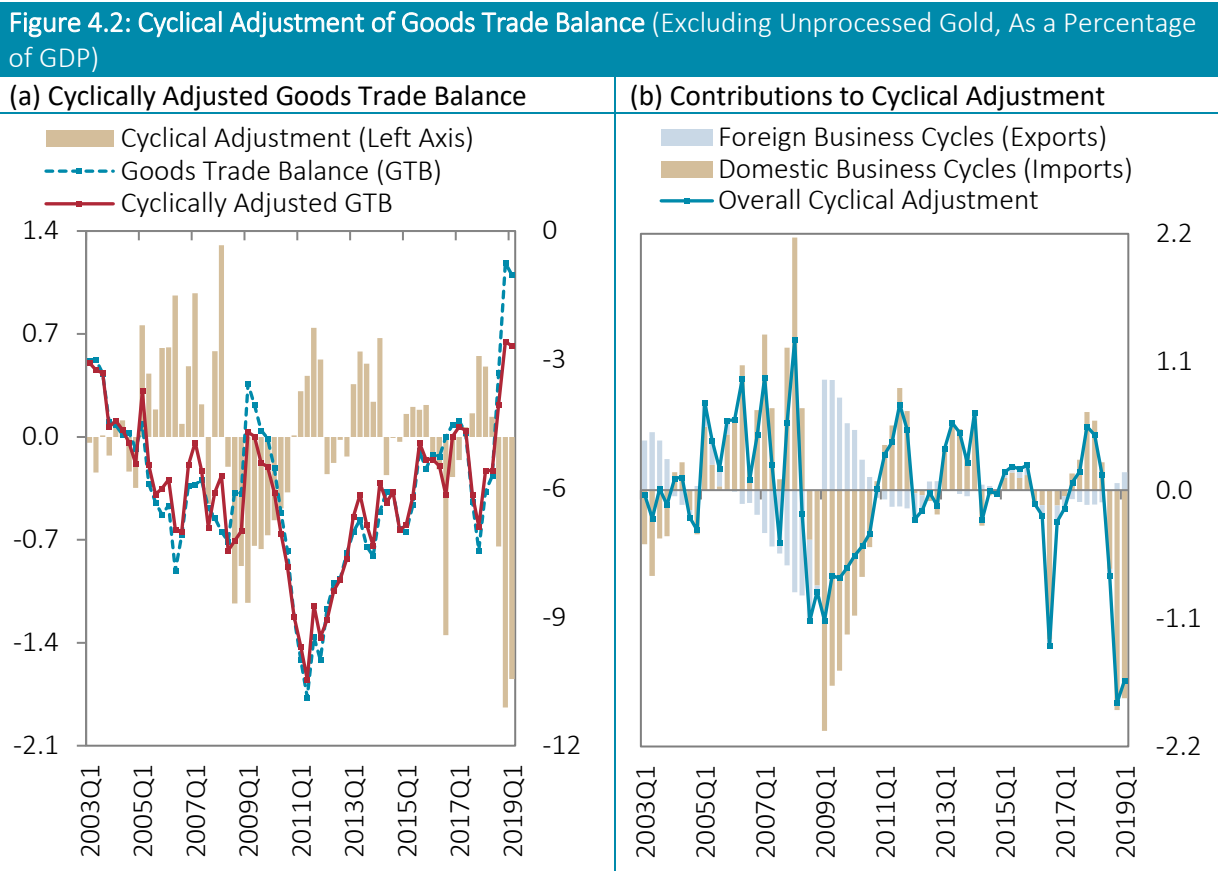
smoothing parameter of HP filter is set to 1600, a conventional value for quarterly time series data. To reduce the severity of end-point-problem issue with HP filter, the filter is applied to the data that begins in 1998 for both domestic and export weighted GDPs. By extending our data set backwards, we indirectly mitigate the end-point-problem issue at least on one end. To get our baseline output gap estimates, we apply the FMHP filter to the extended data.



Despite the overall resemblance of the three domestic output gap estimates given in Figure 4.1a, there are discernable differences between the series. For the first quarter of 2009 when the effects of global financial crisis were deeply felt, FMHP filter estimates an output gap of -7.5 percent, while the HP filter and the CBRT estimates point to -8.4 and -9.5 percent, respectively. As a recent example, in the first quarter of 2019, FMHP filter implies an output gap of -5.4, a larger swing from the potential output than the CBRT estimate of -4.0 percent and HP-filter estimate of -4.2 percent. In case of the export-weighted global output, FMHP and HP filters seem to produce very similar gap estimates especially for the period of global financial crisis and in the following years. In the rest of our baseline calculations we stick to the output gap estimates from FMHP filter. However, we refrain from a detailed discussion of which filter produces the best adjustment so long as our paper solely focuses on the cyclical adjustment of current account balance rather than finding the best filtering method.

We treat goods and services trade balances individually mainly for two reasons. First, it makes it possible to estimate the cyclical components in exports in a more accurate way because income

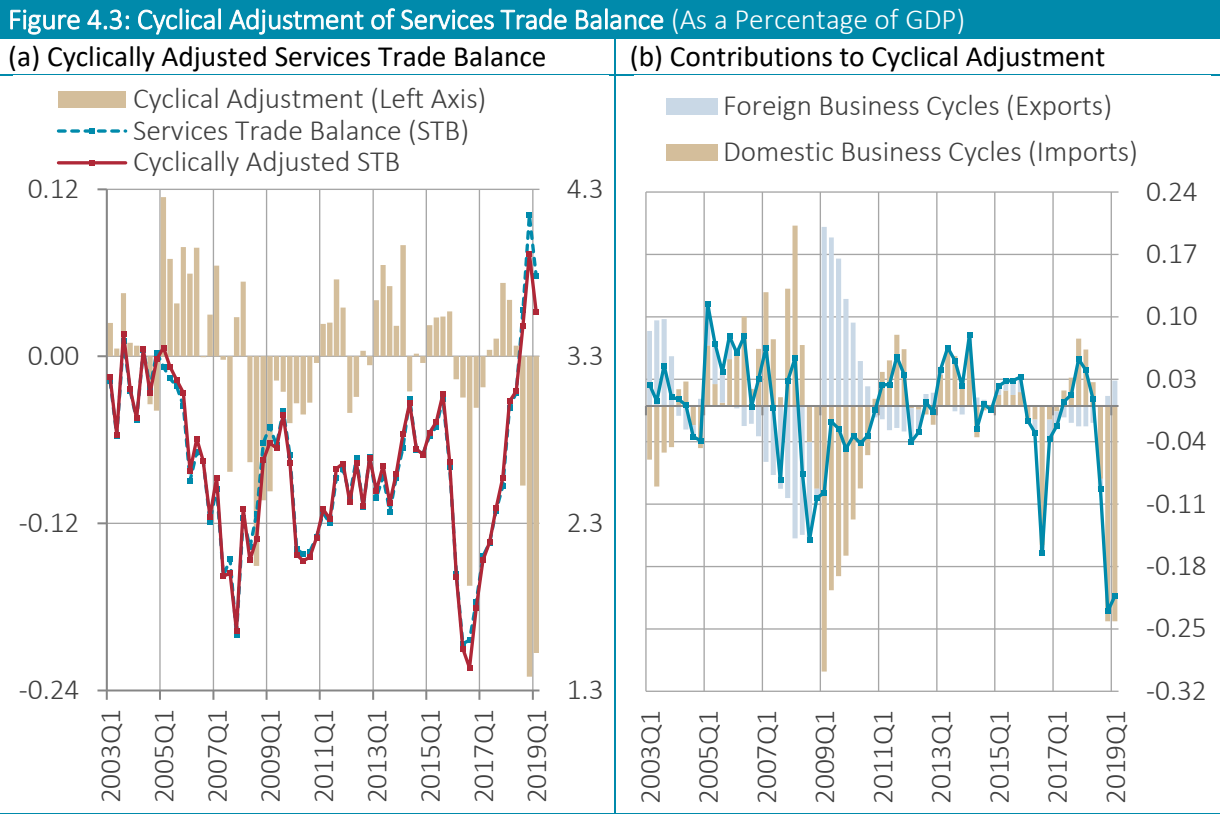
elasticity of exports differs notably between goods and services sectors. More specifically, income elasticity of exported goods is considerably higher than that of services. So, if the elasticities are assumed to be identical, the impact of foreign business cycles would be underestimated for the goods and overestimated for the services. Second, it allows us to distinguish sources of cyclical adjustment in current account balance. In this respect, it provides valuable information to the policymakers who aim to design policies that target goods and services trade independently. Even if such a separation makes a small difference for the overall cyclical adjustment, it helps correctly identify the contributions of the two different sectors, namely goods and services, to the overall cyclical adjustment.



To adjust goods trade balance (GTB) excluding gold for business cycle ups and downs, we first employ Equation 3.2 for exports and imports, separately. Then, the adjusted trade balance is obtained by subtracting the adjusted imports from the adjusted exports. Figure 4.2 displays both the adjusted and unadjusted trade balances as a percentage of GDP along with the estimated amount of adjustment in the first panel and the contributions of exports and imports to the adjustment in the second panel. According to our estimates, the size of cyclical correction in trade balance varies from -1.8 to 1.3 percentage points where a positive sign means that trade balance is undergoing a deterioration associated with cyclical movements and a negative sign indicates a cyclical improvement in trade balance. So, a cyclical adjustment basically refers to the removal of cyclical

component from a series, and hence a positive (negative) adjustment is an indication of the presence of negative (positive) cyclical component in the original series.

The second panel shows the sources of cyclical adjustment in the sense that whether it originates from imports (domestic business cycle) or exports (foreign business cycles). During the global financial crisis, despite the cyclical deterioration in exports caused by the global slowdown, the trade balance seems to have experienced a large cyclical improvement mainly because the domestic economy was in a big cyclical downturn. So, the overall cyclical correction hinges on both the relative magnitudes and signs of domestic and global output gaps. In the first quarter of 2019, the goods trade balance runs a deficit that is equal to 1 percent of GDP. In the same quarter, the cyclical component is estimated to be around 1.6 percent of GDP. If all business cycle effects were to be removed regardless of whether domestic or foreign originated, the cyclically-adjusted deficit would be -2.7 percent of GDP.

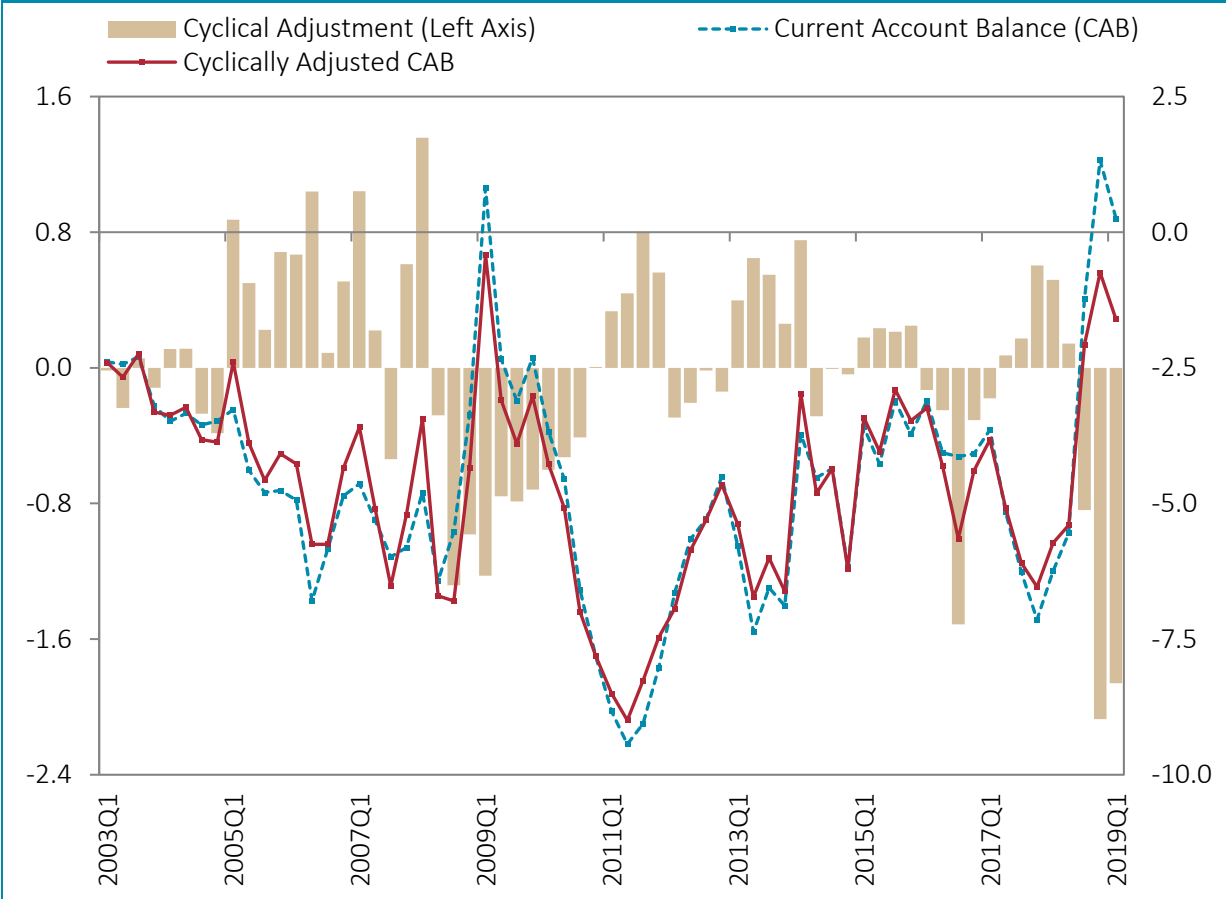


The second biggest item in the current account is the services trade balance (STB). Unlike goods trade balance, services trade balance is always positive in the period of analysis, and thus plays an important role in balancing the current account. By using Equation 3.2 and the elasticities given by Table 3.1, cyclical components of exports and imports of services are estimated. The results are summarized by Figure 4.3. Our results suggest that the impact of foreign business cycles relative to their domestic counterparts is bigger for the services trade than the goods trade reflecting the relative sizes of exports and imports. Overall cyclical adjustment ranges from -0.2 to 0.1 percent of



GDP, a smaller interval than the one for the goods trade balance. In 2018, cyclical adjustment of exports remains negative excluding the last quarter because the export weighted global GDP positions above its potential level while the cyclical adjustment of imports is positive in the first half and turns negative in the second half as the economy transits from a cyclical upturn to a downturn. The combined adjustment in the services trade balance is positive in the first half of the year negative in the second half as the impact of domestic business cycles starts to weigh more.

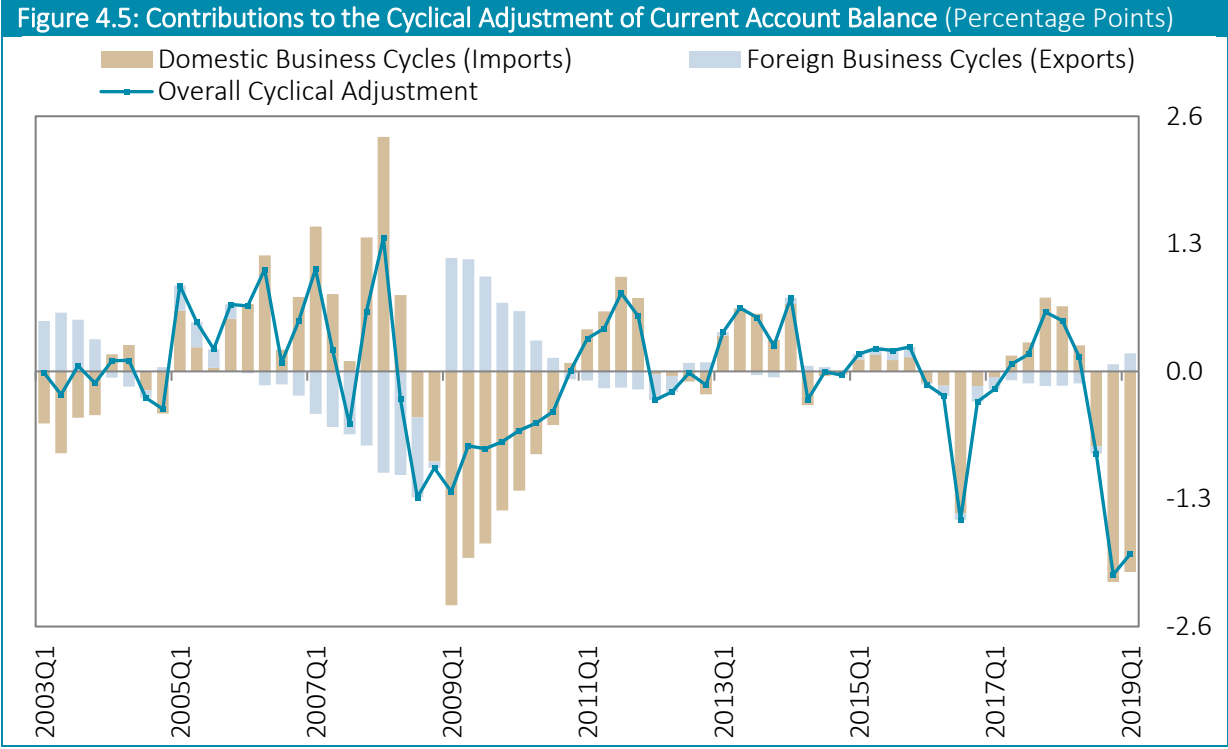
**Figure 4.4: Cyclical Adjustment of Current Account Balance (As a Percentage of GDP)**



The cyclically adjusted current account balance is the sum of cyclically adjusted goods (excluding unprocessed gold) and services trade balances, unadjusted current transfers, and gold trade balance. The adjusted current account balance and the amount of adjustment are plotted by Figure 4.1.4.<sup>10</sup> According to the figure, the domestic and trading partners` cyclical movements seem to have a considerable impact on the current account balance of Turkey. The size of cyclical adjustment changes from -2.1 to 1.4 percent of GDP over the period of analysis with positive values associated with cyclical deterioration and negative values associated with cyclical improvement in the current

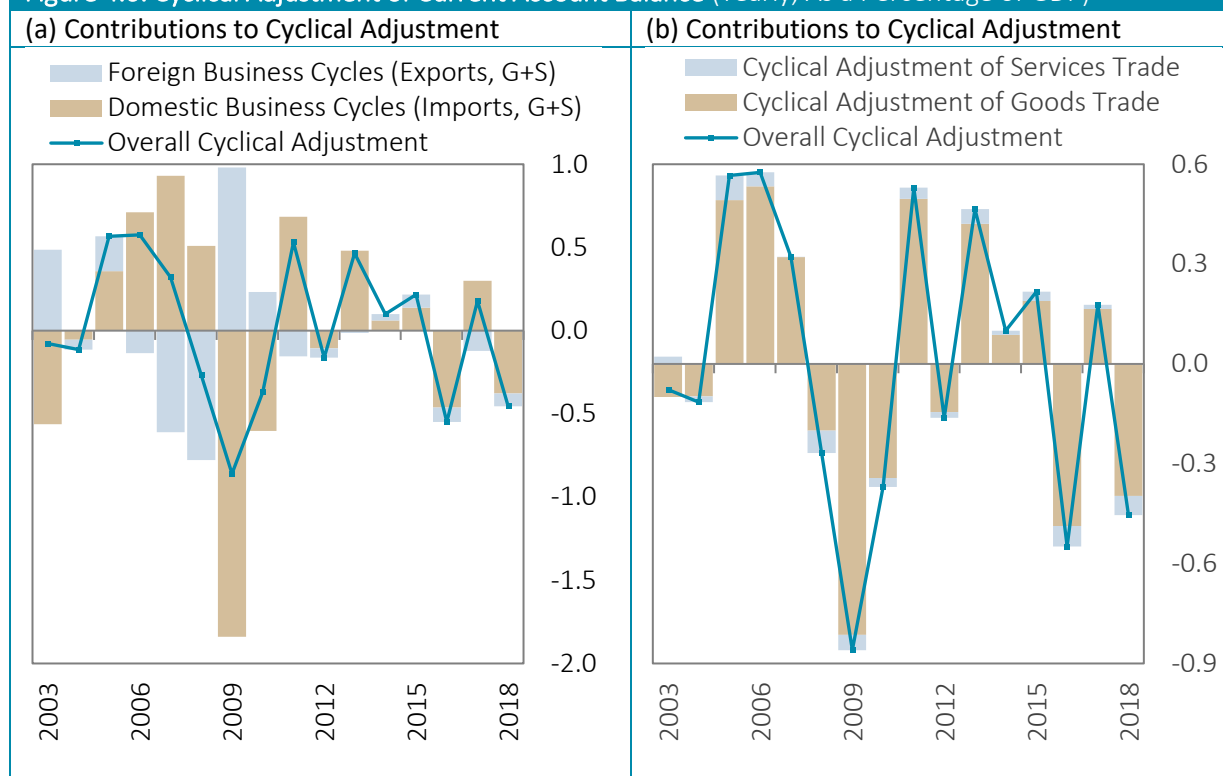
<sup>10</sup> See Figure A.1. in Appendix A for an annualized version of the figure. In addition to domestic and foreign business cycle effects on current account balance, we also investigate the impact of cyclical movements of export and import prices from their own long-run trends. We report our findings in the Robustness Analysis section and provide a short discussion about the impact of price cycles.

account balance. In our period of analysis, there are only three quarters in which the unadjusted current account balance is positive: the first quarter of 2009, the last quarter of 2018, and the first quarter of 2019. When adjusted for cyclical movements, the current account balance becomes negative in those quarters although the adjusted deficit remains much below the historical averages.



Next, Figure 4.5 exhibits the contributions by foreign (exports) and domestic (imports) business cycles to the cyclical adjustment. The contribution of imports, goods and services combined, spans from -2.4 to 2.4 percentage points whereas the range is smaller for the exports and is from -1.1 to 1.2 percentage points. In terms of magnitude, the largest cyclical adjustment is estimated to be -2.4 percentage points for imports in the first quarter of 2008 when the impact of global financial crisis on the domestic economy was at its peak. Nevertheless, the total cyclical improvement in current account remains around 1.2 percent of GDP due to the opposite impact of foreign business cycles following the global retrenchment. Moreover, the total adjustment becomes the largest in the last quarter of 2018 with a negative cyclical adjustment that is equal to 2.1 percent of GDP. Given that the export weighted global GDP is around its potential level in that quarter with a very small cyclical impact, almost all of the improvement is due to the cyclical downturn of the domestic economy.

**Figure 4.6: Cyclical Adjustment of Current Account Balance (Yearly, As a Percentage of GDP)**

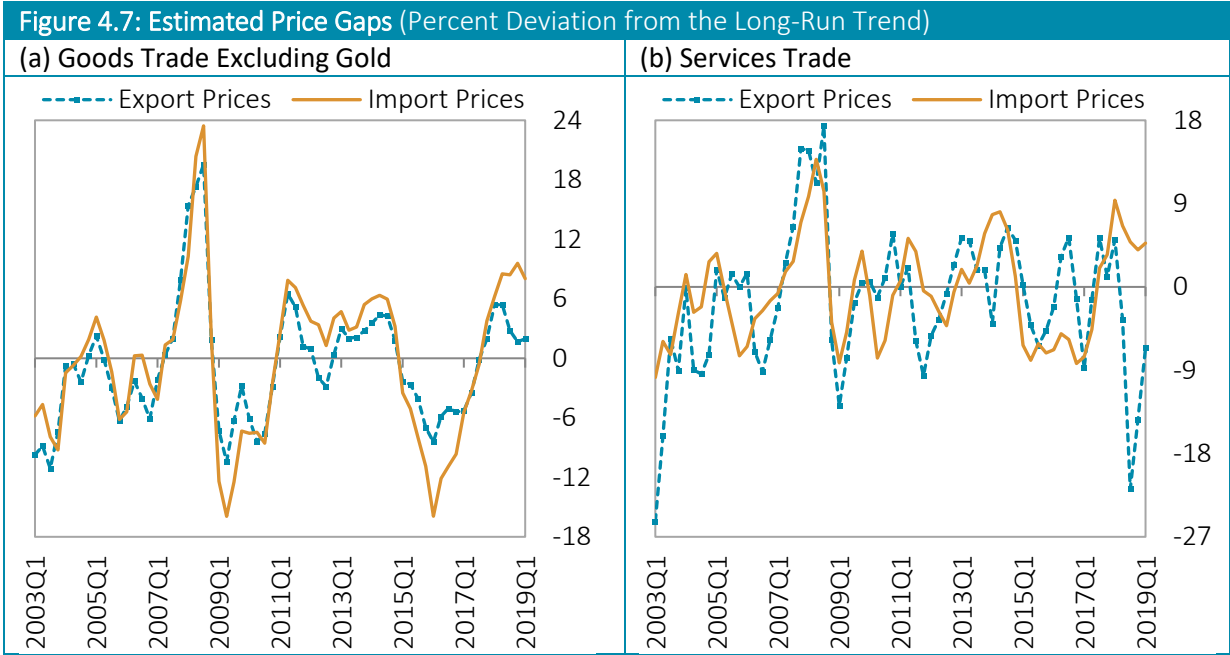


To see the scale of cyclical correction at a lower frequency, we calculate the annual cyclical adjustments by summing over the quarterly figures. Figure 4.6 shows the annual cyclical adjustments and the contributions by exports and imports (panel a) and the contributions by goods and services trade balances (panel b). Panel a of the figure is yearly version of Figure 4.5 and breaks down the cyclical adjustment with respect to whether it originates from domestic or global business cycles. Additionally, Figure 4.6b plots the contributions from the goods or services trade balances to the cyclical adjustment. Our findings suggest that in terms of its magnitude, the cyclical adjustment of services trade balance on average corresponds to 12 percent of the cyclical adjustment in goods trade balance excluding gold. In other words, the cyclical adjustment in current account balance is largely driven by the goods trade balance.

## 4.2. Incorporating Price Cycles

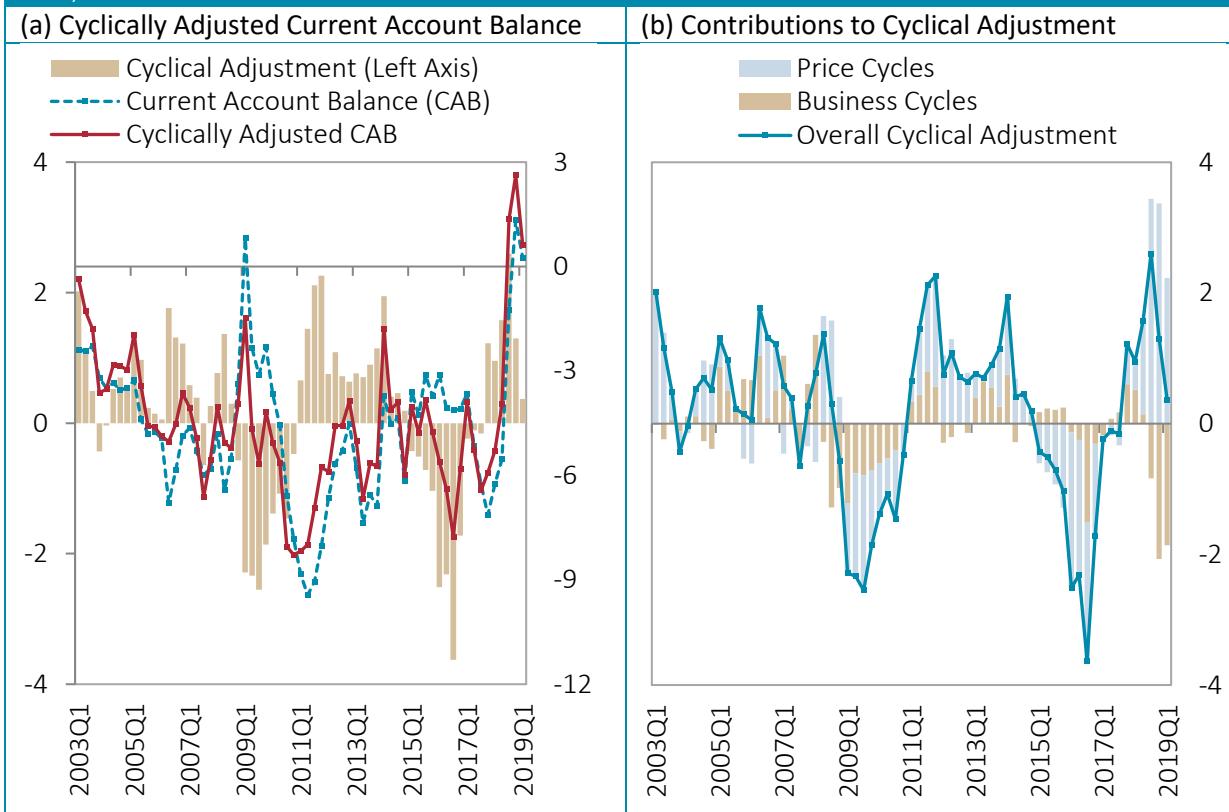
In this subsection, we go one step further and estimate the cyclical components in the export and import prices and then incorporate them with our adjustment process for the current account balance. To do so, we just need to substitute the prices in Equation 3.6 and 3.7 with their respective trends obtained from FMHP filter. This extended cyclical adjustment removes not only the cyclical components associated with the domestic and foreign business cycles but also the cycles as deviations of prices of traded goods and services from their own long-run trends. The rest of the calculations remain unchanged and we derive the current account balance adjusted for both

business and price cycles. Throughout this subsection, cyclical adjustment refers to the case for which current account balance is adjusted for both business and price cycles.

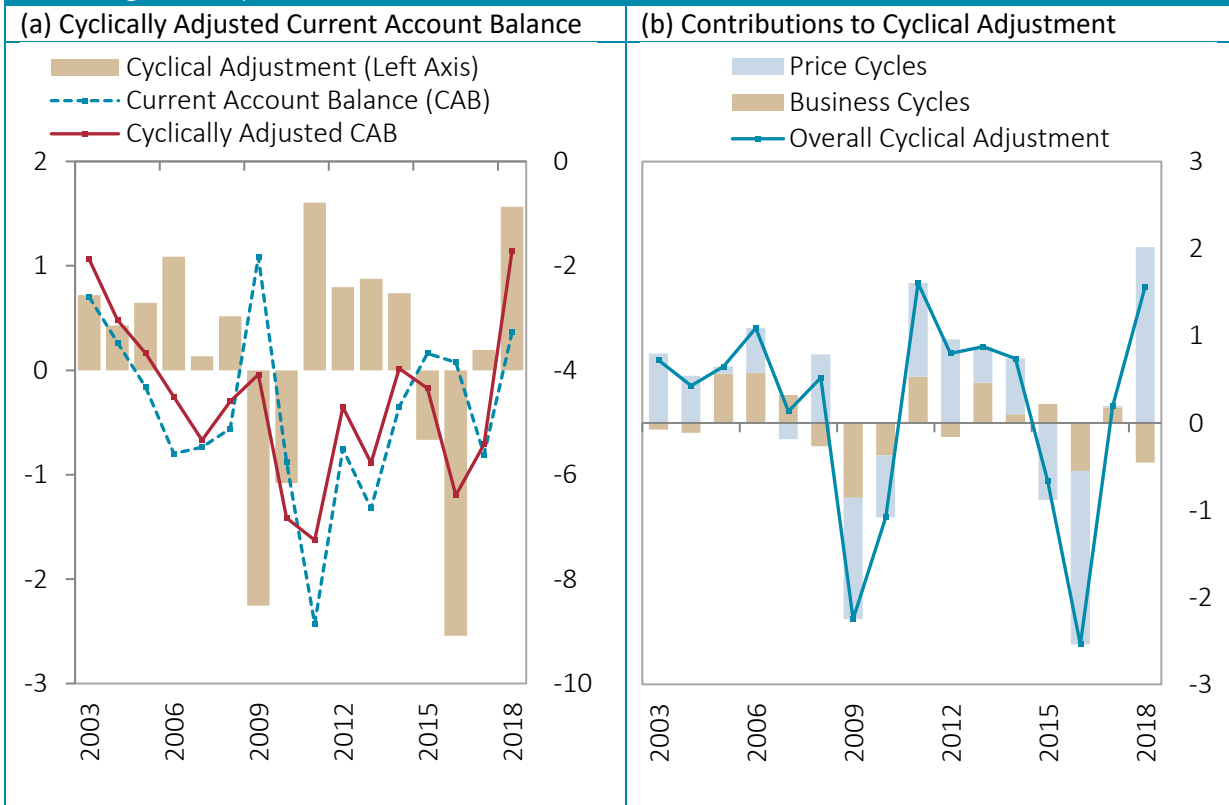


The deviations of prices from their respective long-run trends are exhibited by Figure 4.7. In case of goods, the impact of domestic developments on both import and export prices is limited given the size of the domestic economy, and thus, prices are usually determined by the global factors such as world demand, oil prices, and the level of global trade openness. So, as shown in Figure 4.7a, the export and import prices follow very similar cycles. The observed discrepancies are mainly attributed to the compositional differences between exports and imports and small price adjustments in response to domestic developments. For the services trade, export prices are predominantly determined by domestic factors while the import prices are totally driven by global factors given the small size of domestic demand relative to global demand. Therefore, the estimated output gaps display big differences for the export and import prices of services. They even move in opposite directions in some quarters, for instance from 2018Q2 to 2019Q1, a period marked with a global cyclical boom and a domestic cyclical bust.

**Figure 4.8: Adjustment of Current Account Balance For Business and Price Cycles (As a Percentage of GDP)**



**Figure 4.9: Annual Adjustment of Current Account Balance For Business and Price Cycles (As a Percentage of GDP)**



In addition to business cycle adjustments, price cycle adjustments lead to substantial changes in the cyclically-adjusted current account balance. The extent to which the extra adjustment for price cycles can change the outlook of the cyclically-adjusted current account balance is given by Figure 4.8 and 4.9. The figures also provide a breakdown of cyclical adjustment into price and business cycles. In most cases, price cycles run in the same direction as business cycle and amplify their impact considerably. For instance, during the global financial crisis, both business and price cycles lead to big improvements in the current account balance and the overall adjustment reaches to -2.6 percent of GDP in the third quarter of 2009.

There are also cases in which business and price cycles work in opposite directions and cancel out their relative effects on the current account balance. An example of such a case covers from 2018Q3 to 2019Q1, inclusively. During that period, the current account balance displays a sizeable improvement mainly because the domestic economy experiences a cyclical downturn. On the other hand, prices of both imported and exported goods move above their corresponding long-run trends with the former being positioned higher. So, the price cycles makes the current account balance deteriorate during the same period. Our findings suggest that the adjustment for price cycles is positive and grater in size than the negative business cycle adjustment. Therefore, the final cyclically-adjusted current account balance turns out to be more positive unlike the case in which only the business cycles are taken into account.

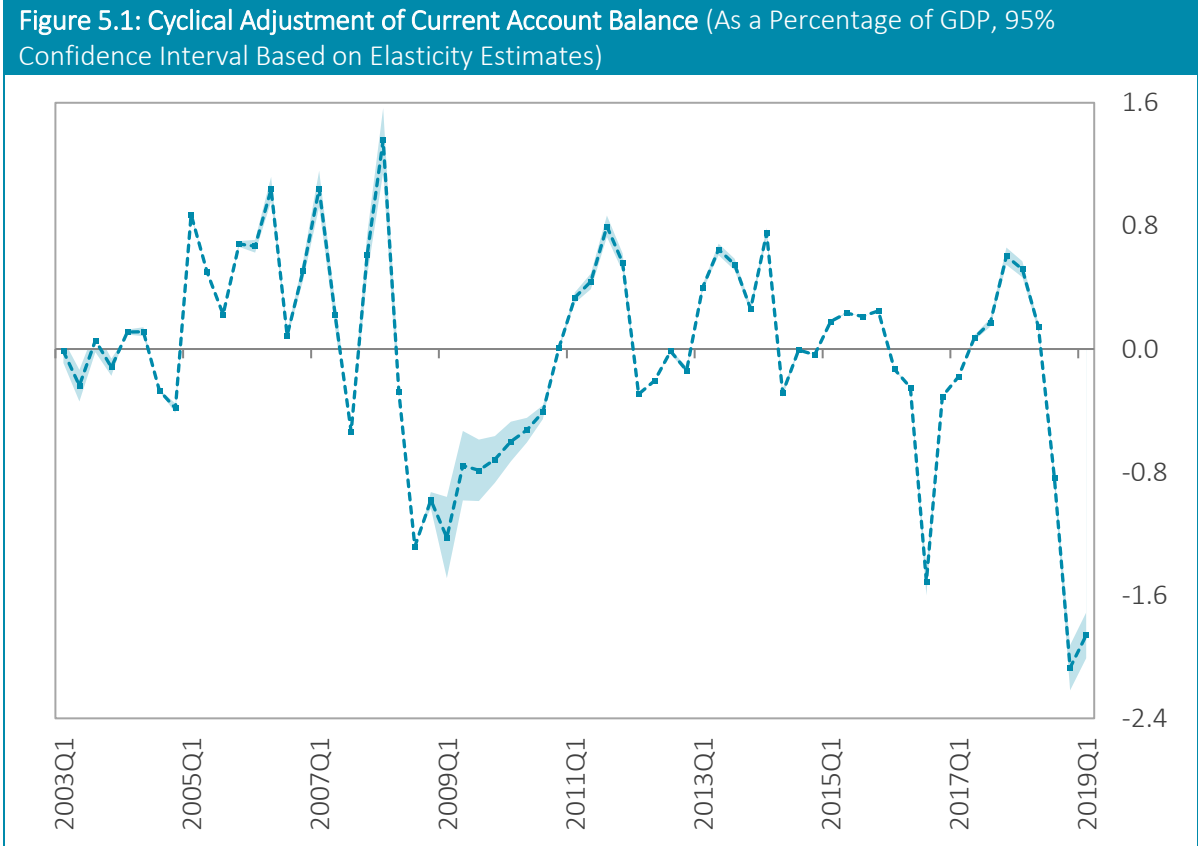
## **5. Robustness Analysis**

The income elasticities of exports and imports constitute an integral part of the cyclical adjustment of the current account balance. Because the adjusted final series is sensitive to the choice of the value of the elasticity measure due to the nature of the cyclical-adjustment mechanism via employing the long-run elasticities, this section is reserved for a robustness analysis of our results based on a range of elasticities. Table 5.1 reports a summary of a 95% confidence band of the long-run income elasticities of the related components of the current account balance of Turkey that is valid for the estimation period. The Figure 5.1 provides the cyclically adjusted current account balances of Turkey in a quarterly frequency based on the elasticities outlined in Table 5.1. It demonstrates a summary representation of the cyclical-adjustment corresponding for the low and high values of the income elasticities of the components of the current account. Except for the 2009-2011 period and the recent two quarters, the 95% confidence band does not indicate a significant dispersion between the upper and the lower bands of the cyclically-adjusted series. Since the different cyclically adjusted current account balance series that are constructed by the upper and lower values of the corresponding elasticities of the current account components follow closely each

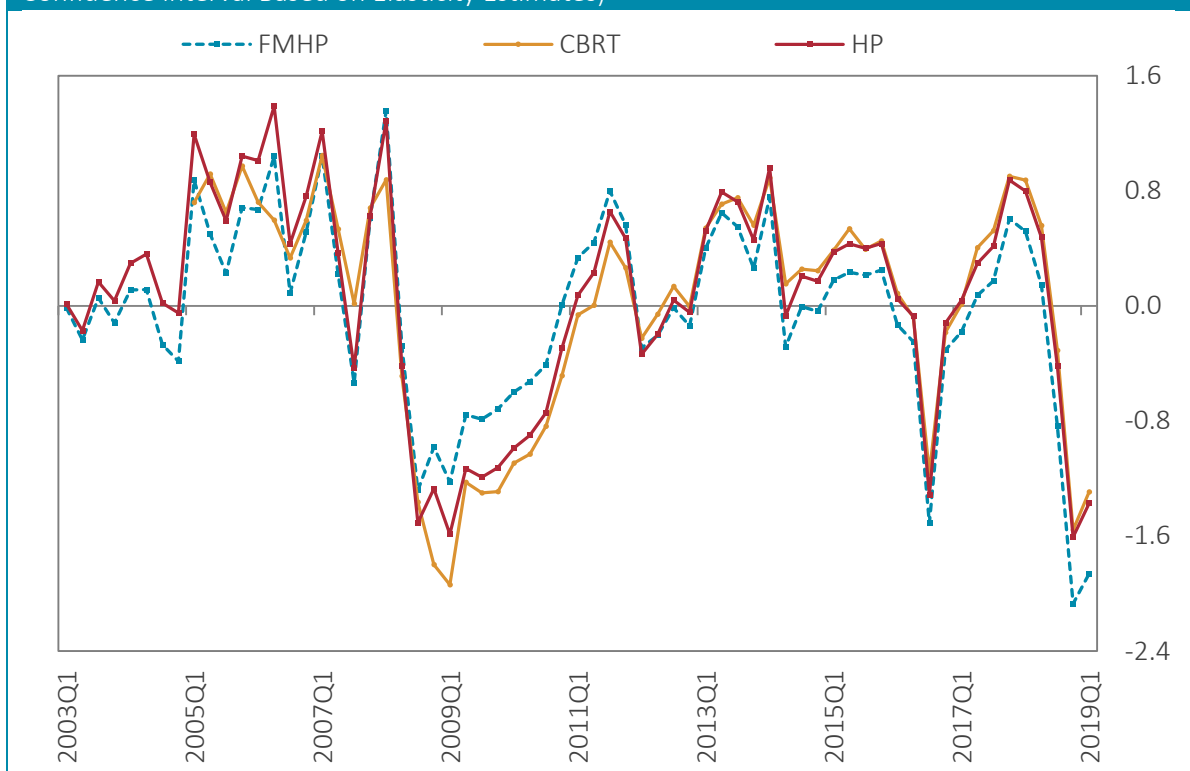
other, except for the aforementioned time intervals, this evidence enables us to arrive a robust estimate of cyclically-adjusted series that is based on our benchmark elasticities.

For the expositional purposes, the cyclical adjustment of the current account balance of Turkey by using different output gaps produced by the conventional HP Filter, FMHP Filter and the output gap calculations of the CBRT is presented with the Figure 5.2. Employment of different filters for the calculation of the long-run domestic and global output levels yields approximately similar results.. Therefore in light of these findings, the resulting cyclically-adjusted current account balance is said to be robust to different choices of filters as well as different elasticity values.

Table 5.1: 95% Confidence Interval for Long-Run Income Elasticities				
	Exports		Imports	
	Low	High	Low	High
Goods Excluding Unprocessed Gold	2.08	2.28	1.17	1.32
Services	1.01	1.71	1.18	1.37



**Figure 5.2: Cyclical Adjustment of Current Account Balance (As a Percentage of GDP, 95% Confidence Interval Based on Elasticity Estimates)**



## 6. Conclusion

Monitoring the current account balance of an economy is important for an appropriate macroeconomic policy design and for the analyses of existing policies regarding the external balance. Because the developments in the current account balance can not be considered independent from the cyclical movements prevalent in both global and the domestic economy, it is important to separate the structural and cyclical factors from each other. Therefore, it has a significant place to have a cyclically adjusted current account balance to be followed by the policy makers.

In this paper, we aim to evaluate the role of the cyclical factors on Turkish current account balance and to estimate a cyclically-adjusted current account. To this end, we base our strategy on the estimation of domestic and foreign business cycles by a modified version of commonly used HP filter and their impact on the goods and services trade balance, separately through the long-run income elasticities. Our findings suggest that the behavior of current account balance of Turkey from 2003 to 2018 is principally shaped by the non-cyclical factors such as terms of trade, exchange rate and other macroeconomic fundamentals mainly through the goods trade balance despite the substantial impact of both domestic and foreign business cycles on the current account. The overall cyclical adjustment in the current account varies from -2.1 to 1.4 percent of GDP with negative values associated with deterioration and positive values with improvement while the adjusted current



account balance remains between -0.5 and -9 percent of GDP. Our results also imply that the cyclical adjustment in the goods trade balance is much bigger than the services trade balance and the impact of domestic business cycles seems to be more dominant at all. Moreover, the magnitude of total adjustment obviously depends on the relative positions of domestic and trade partners in the business cycle.

Besides the baseline findings, the incorporation of the price cycles implies that except for the few periods where the export prices are positioned above that of the imports, the price adjustment contributed positively to the overall cyclical adjustment of the current account balance of Turkey and in the same direction with the business cycles. Overall during the estimation period, the price adjustment works as an augmenting mechanism which moves the cyclically adjusted current account balance to even more opposite direction.

The unadjusted current account runs deficit over the period of analysis except the first quarter of 2009, the last quarter of 2018 and the first quarter of 2019. In the first incidence of current account surplus, the global economy was deeply experiencing the adverse effects of the great financial turmoil of 2008 and the domestic economy was also in a big cyclical slowdown. After the cyclical correction of -1.3 percentage points, the cyclically-adjusted current account balance becomes -0.5 percent of unadjusted GDP. In the more recent period, the last quarter of 2018, the unadjusted current account balance was recorded as 0.9 percent of GDP and this surplus turns into a deficit that is equivalent to 0.5 percent of GDP when the impact of domestic and foreign business cycles are ruled out. So, the total cyclical correction amounting to 1.4 percent of GDP is the part of the current account balance that is due to both domestic and foreign business cycle movements. Even in these two rare periods in which the unadjusted current account is positive, the adjusted current account balance becomes negative.

In light of our findings, we reach the following policy inferences: On one hand, because the cyclical movements play a significant role on the current account dynamics of Turkey, particularly on the goods trade balance, it is evident that there is room for cyclical policies for the external adjustment and the rebalancing process. As we document in this paper that due to the sensitive nature of the current account balance to both the business and price cycles, it is of significant importance that these cycles must be taken into consideration during the process of economic policy design aimed at achieving external balance targets. On the other hand, since the cyclically-adjusted figures appear to give negative balance over the long term, the chronic current account deficit issue of Turkish economy requires policies that are in line with the structural reforms.

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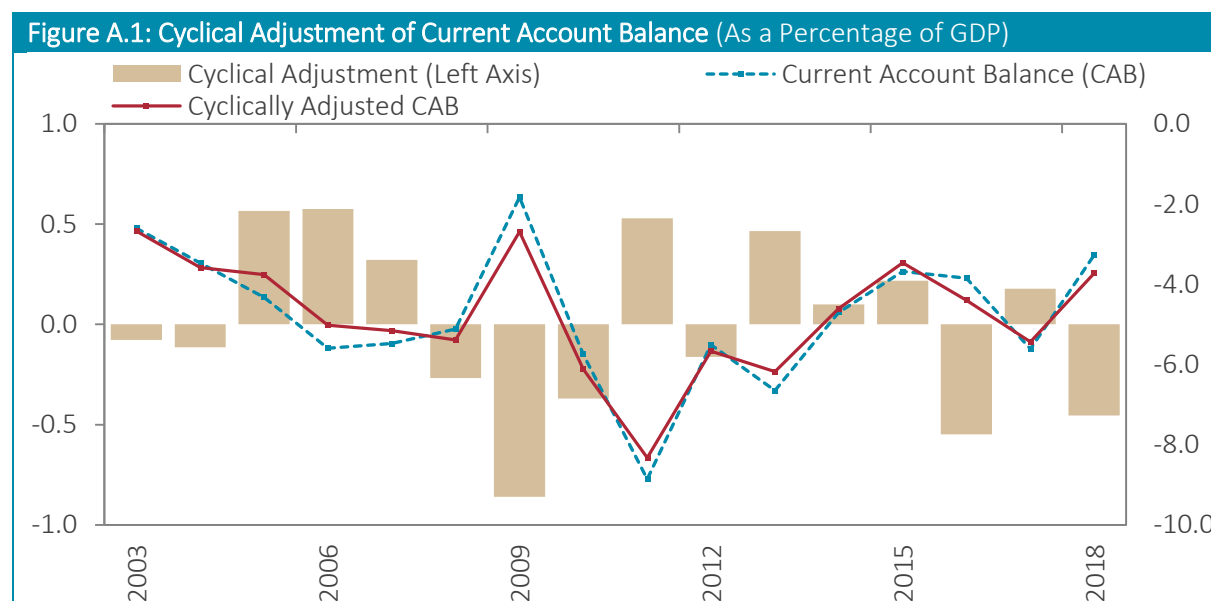
## Appendix A

**Table A.1. Long-Run Elasticity Estimates**

	Exports of Goods (Excluding Gold)	Imports of Goods (Excluding Gold)	Exports of Services	Imports of Services
Constant	-5.43*** (0.248)	-4.64*** (0.430)	4.10*** (1.206)	-4.20*** (0.605)
Domestic GDP		1.25*** (0.037)		1.27*** (0.048)
Export Weighted World GDP	2.18*** (0.052)		1.36*** (0.177)	
Real Effective Exchange Rate		0.77*** (0.062)	-1.24*** (0.114)	0.64*** (0.101)
Number of Observations	65	65	65	65
Adjusted R2	0.97	0.97	0.90	0.94

- Standard errors are given in parentheses. Column titles are the names of dependent variables.

- \*\*\*, \*\*, and \* represent statistical significance at 0.01, 0.05 and 0.1 levels, respectively.



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