

# GREECE MACRO MONITOR

November 8, 2016

## Greek real GDP NOWcasting

Q3 2016: +0.2%/0.4% QoQ/YoY

FY-2016 forecast range: -0.3% to 0.0% YoY

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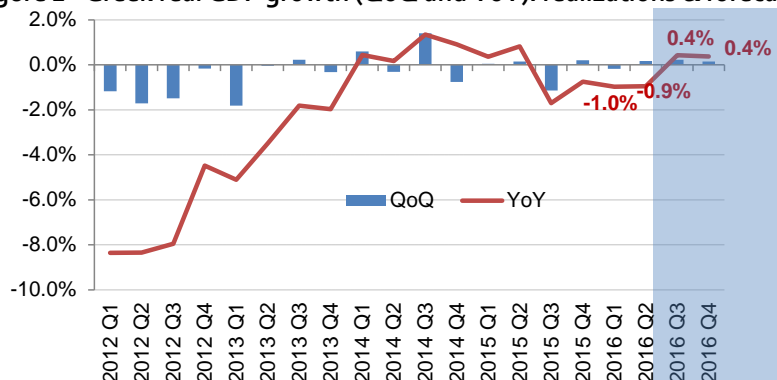
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### Introduction

Based on a number of macro data releases up to November 2<sup>nd</sup>, this note provides an estimate of Greek GDP for Q3 2016 as well as our revised forecast for the full-year. For this purpose, we utilize two distinct methodologies; namely the GDP Nowcasting framework we first introduced in late 2013 as well as a mixed-data sampling methodology employing MIDAS/Bridge-type models.<sup>1</sup> As a reminder, our Nowcasting model produces high frequency, real-time estimates of Greece's gross domestic product by applying an econometric methodology that can properly handle data reporting lags, revisions and other important aspects characterizing the daily flow of macroeconomic information. In a similar fashion, the MIDAS models combine information from monthly-sampled variables that are released ahead of the respective (quarterly) GDP data. They fully take into account the publication lags of the monthly variables themselves and use data appropriately aligned so that respective forecasts made ahead of the actual GDP release are as informative as possible. For the particular exercise presented herein, we emphasize that due to reporting lags, the flow of macroeconomic data pertaining to Q3 2016 will continue in the following couple of months and thus, our estimates should be considered as preliminary and subject to revisions. That is, especially taking into consideration the high degree of uncertainty currently characterizing the domestic macroeconomic trajectory. All in all, we are looking for real GDP growth of c. 0.2%/0.4% QoQ/YoY in Q3, while for the full year we are now expecting a growth reading between -0.3% and 0.0%. This implies a carry-over of c. +0.2ppts into 2017, which compares with a negative base effect of c. -0.3ppts this year. Note that our earlier GDP growth forecast for 2016 was -0.5%, revised from an initially expected -1.0%. As a final note, we emphasize that the forecasts/nowcasts presented herein are based on a set of macroeconomic data released so far and thus, they do not take into account revisions in past quarterly data that are expected to be announced along with the next quarterly national accounts update on November 14<sup>th</sup>.

**Figure 1 - Greek real GDP growth (QoQ and YoY): realizations & forecasts**



Source: Eurobank Economic Research, EL.STAT., EC.

<sup>1</sup> [https://www.eurobank.gr/Uploads/Reports/GDP%20Nowcasting%20-%20Greece%20-%20Macro%20Monitor%20\(18%20November%202013\).pdf](https://www.eurobank.gr/Uploads/Reports/GDP%20Nowcasting%20-%20Greece%20-%20Macro%20Monitor%20(18%20November%202013).pdf)

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**MIDAS & NOWcasting model estimates of Q3 GDP**

Table 1 below presents a range of forecasts/nowcasts for Greek year-on-year real GDP growth in Q3 2016, produced by our mixed data sampling (MIDAS) model. In addition to past GDP growth (till Q2 2016), which constitutes the sole explanatory variable in our benchmark specification, the table also presents the estimation output for a number of alternative specifications. These include the following monthly indicators: retail sales volume, retail sales turnover, industrial production, economic sentiment and consumer confidence. These variables have been selected from an extended list of economic indicators on the basis of their superior performance in explaining future GDP growth.

**Table 1 – MIDAS model's nowcasts for Greek Q3 2016 real GDP growth (YoY)**

<b>A</b>	Benchmark	0.64%
<b>B</b>	Retail Sales Volume and Economic Sentiment	-0,04% to 0,67%
<b>C</b>	Retail Sales Volume and Consumer Confidence	-0,43% to 0,30%
<b>D</b>	Industrial Production only	1,03% to 1,23%
<b>E</b>	Retail Sales Turnover only	-0,34% to 0,39%
<b>F</b>	Average A and B	0.32%
<b>G</b>	Average A and C	0.17%
<b>H</b>	Average A and C	1.03%
<b>I</b>	Average A and E	0.27%
<b>J</b>	Average B and C	0.10%
<b>K</b>	Average D and E	0.66%
<b>L</b>	Average A through K	0.42%
<b>M</b>	Median	0.39%
<b>N</b>	Mean	0.42%
<b>O</b>	SD	0.48%
<b>P</b>	Lower bound, mean forecast (N)	0.20%
<b>Q</b>	Upper bound, mean forecast (N)	0.64%

Source: Eurobank Economic Research, EL.STAT., EC.

Models and forecasts are labeled from A to Q. Model A is our benchmark, which uses only past growth of real GDP to generate the respective forecast for Q3 GDP. Besides past GDP growth, retail sales volume and economic sentiment are used as additional explanatory variables in Model B, while retail sales volume and consumer sentiment are the monthly indicators used in estimating Model C. In a similar fashion, Model D features industrial production as the sole explanatory variable (besides past GDP growth) and retail sales turnover is the sole monthly variable entering Model E. As can be inferred by the table above, Model D produces the highest (more positive) range of forecasts for Q3 GDP growth among all estimated models, while Model E estimates a forecast range which is broadly similar to that of Model C.

Next, we proceed with the computation of various model averaged forecasts (lines F to L). All respective values fall into the positive territory. Furthermore, our overall mean forecast is 0.42% (line N) with a 95% confidence interval that is strictly positive i.e., 0.20% to 0.64%. This range is not only consistent with our benchmark forecast (Model A), but also tallies well with the forecast range produced by models B and D. To ensure that our results are not biased by the use of averaging with the benchmark specification (Model A), we repeat the averaging across models B, C, D and E (not presented in the table below) and the resulting 95% confidence interval becomes 0.05% to 0.76%. Overall, we interpret our results as pointing to broadly positive year on year real GDP growth in Q3 2016. Fairly similar results (not shown in this note) are also produced by our Greek GDP NOWcasting model. A brief technical note on our Greek GDP NOWcasting & MIDAS models is provided in the Appendix at the end of this document.

## A quick look at recent domestic macroeconomic developments

### *GDP dynamics and components in H1 2016*

The pace of domestic recession decelerated slightly in H1 2016, with real GDP growth (seasonally adjusted data) coming in at -1.0% from -1.2% YoY in the second half of last year. The main drivers behind this performance were domestic demand and exports. More specifically, real private consumption decreased by 1.4% YoY, while public consumption and exports recorded respective declines of -2.6% YoY and -11.4% YoY in the 1<sup>st</sup> semester of this year. Over the same period, gross capital formation increased by 12.1% YoY (2.0% in gross fixed capital formation terms), while imports decreased by 9.6%. On a quarterly basis, the performance of the domestic economy in terms of YoY real GDP growth was broadly similar in Q1 and Q2 2016 (i.e., -1.0% YoY and -0.9% YoY respectively), while a closer look at the evolution of key demand-side components reveals some interesting developments. In more detail, the annual pace of decline of real private consumption accelerated in Q2, coming in at -1.7% YoY from -1.0% YoY in the prior quarter. This deterioration was accompanied by a further deterioration in the consumers' confidence indicator. On a more positive note, real gross capital formation growth picked up steam in the second quarter, accelerating to 22.5% YoY from 3.2% YoY in Q1 2016. The respective figures for gross fixed capital formation were -2.5% YoY and 7.0% YoY. Hence, there was a rebound both in fixed investment and in the change of inventories. Separately, the drop of imports was less steep in Q2 2016 (-7.1% YoY) relative to Q1 2016 (-11.9% YoY). On the other hand, the annual rate of change of both real public consumption (-2.7%) and real exports (-11.4%) in Q2 2016 remained relatively unchanged compared to the prior quarter. Finally, a positive sign for Greece's future economic performance came in the form of positive quarter-on-quarter real GDP growth in Q2 2016 (+0.2%), mainly on the back of the positive contribution from gross fixed capital formation (+1.0% QoQ).

### *Labor market developments*

Based on the monthly seasonally adjusted labour force survey data the average rate of unemployment in the first semester of this year was 23.8%, down from 24.6% in H2 2015 and 25.4% in H1 2015. Over the same period, average domestic employment recorded average YoY growth of c. 2.7% (or 97.2 k persons), a slightly higher rate of increase compared to the former semester (2.5%). In a similar vein, the overall number of unemployed declined in H1 2016 at an average monthly pace of -6.1% (or 74.3 k persons) relative to the same period a year earlier. The respective figures in the former semester (H1 2015) were -5.5% and -68.4 k persons. In other words, the decrease in unemployment accelerated in H1 2016. Finally, given the aforementioned changes, the labour force stood at 4,800.9 k persons in H1 2016 higher by 22.9 k persons or 0.5% relative to H1 2015. In our view, the sharp decline in domestic labour cost and, more recently, the slowdown in the pace of the domestic recession are among the main factors contributing the gradual improvement in labour market conditions over the last 2.5 years.

### *Domestic prices*

After reaching a historical peak in H1 2015 (-2.3% and -1.8% in CPI and HICP terms, respectively), domestic deflation embarked on a gradual decelerating path over the past two semesters. More specifically, the average (i.e., per month) CPI change was -1.2% in H2 2015 and -0.9% in H1 2016. The respective figures for the HICP were -0.4% and -0.2%. The slowdown in the annual rate of decrease of the general price level is mainly attributed to the new hikes in indirect taxation (e.g. VAT) that have been implemented in the context of the new bailout programme signed in August 2015. On the latter point, the data on the HICP with constant taxes (CT) are illustrative. The average annual change of HICP-CT decreased from -1.7% in H2 2015 to -2.2% in H1 2016.

### *High Frequency Indicators released year-to-date*

Economic sentiment: the average value of Greece's economic sentiment indicator improved in Q3 2016, both in quarterly and in annual comparison terms – it has increased from 89.9 units in Q2 2016 (80.7 units in Q3 2015) to 91.6 units in Q3 2016. This improvement reflects a rebound in the confidence indicators of industry (+3.3 units relative to Q2 2016), services (+7.6), consumers (+2.8) and retail trade (+5.7). On the other hand, the confidence indicator in construction deteriorated by -14.3 units.

Retail trade volume index: for the 2-month period July to August 2016, the average (i.e. per month) annual change of the retail trade volume index was 3.0% compared to -3.9% in Q2 2016. This improvement reflects mainly the big increase in the value of this index in July 2016 (8.6% YoY and 4.8% MoM). In August 2016, there was a deterioration both on a yearly (-2.7%) and monthly (-4.4%) basis.

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Unemployment rate: the unemployment rate decreased on a yearly basis for the 29<sup>th</sup> consecutive month in July 2016. It dropped to 23.2% from 23.4% in June 2016 and 24.8% in July 2015. The number of employees increased by 2.2% YoY, a rate that is slightly lower relative to the average annual change in Q2 2016 (2.4%). Furthermore, unemployment decreased by -6.4% (-6.0% in Q2 2016) and the labour force marginally increased by 0.1% (0.3% in Q2 2016).

Inflation: Greek CPI averaged -1.0% YoY in Q3 2016, compared to -0.9% YoY in Q2 2016 and -1.8% YoY in Q3 2015. The respective figures for HICP were 0.2% YoY, -0.1% YoY and -0.8% YoY. The deflation based on the HICP-CT also decreased in Q3 2016 (-1.0% YoY from -2.3% YoY in Q2 2016).

Purchasing managers' index: the average value of the Purchasing Managers' Index (PMI) for the Greek manufacturing sector was slightly below the 50 units boom-bust threshold in Q3 2016. More specifically, its value was 49.4 from 49.5 units in Q2 2016.

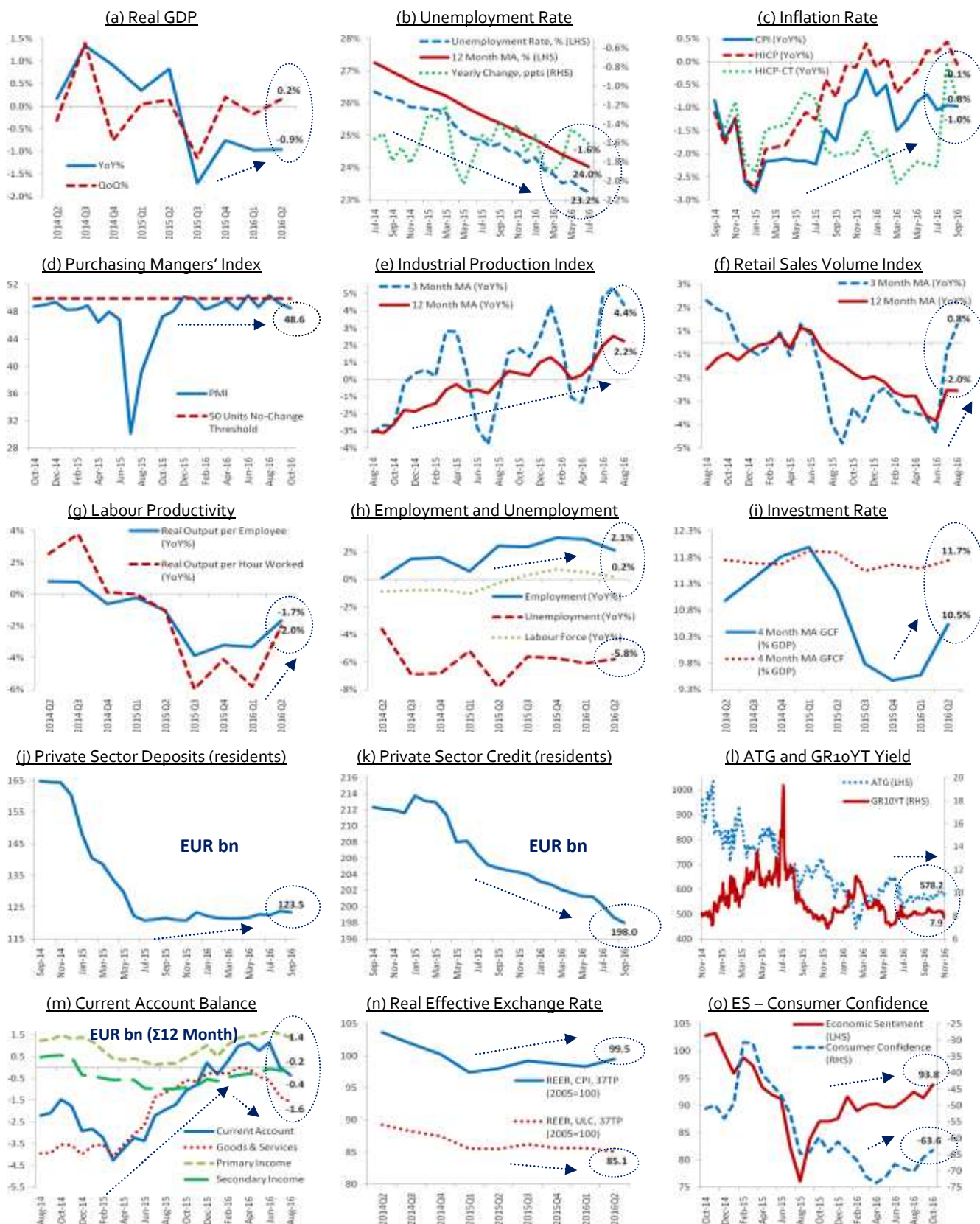
Industrial production: for the 2--month period July-August 2016, the average, i.e. per month, annual change of the industrial production index was +2.5%. The respective figure in Q2 2016 was +4.8%. This slowdown is attributed to the performance of industrial production during August 2016. After increasing by 4.9% YoY in July 2016, it fell to 0.2% YoY in August 2016.

Balance of goods and services (BOP data): the balance of goods and services deteriorated (on a yearly basis) in July and August 2016 by -€782.3 mn and -€235.6 mn, respectively. During this 2-month period, the balance of goods decreased by -€663.6 mn and the respective figure for services was -€384.3 mn.



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Figure 2 : Basic Macroeconomic – Microeconomic Figures of the Greek Economy



Source: (a) EL.STAT., (b) Eurostat, (c) BoG, (d) EC, (e) Markit, (f) Thomson Reuters Eikon.



**References**

"Bridge models to forecast the Euro area GDP", *International Journal of Forecasting*, 20, 447-460, 2004.

"Predicting Volatility: How to Get Most Out of Returns Data Sampled at Different Frequencies", *Journal of Econometrics*, 131, 59-95, 2006.

"MIDAS Regressions: Further Results and New Directions, *Econometric Reviews*, 26, 53-90, 2006.

"Short-term forecasts of Euro Area real GDP growth. An assessment of real-time performance based on vintage data", *Journal of Forecasting*, 27, 371-390, 2008.

"Mixed Data Sampling", *Encyclopedia of Quantitative Finance*, Ole Barndorff Nielsen and Eric Renault (eds) Vol. 3, 1204-120, 2010.

"Regression Models with Mixed Sampling Frequencies", *Journal of Econometrics*, 158, 246-261, 2010.

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