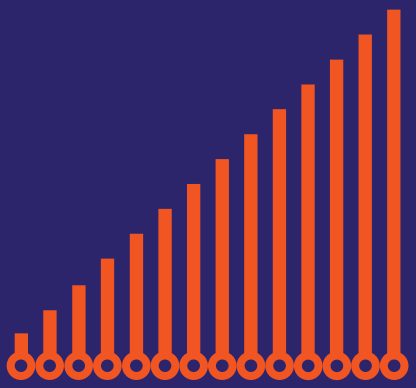
CENTRE OF PLANNING AND ECONOMIC RESEARCH

Issue 31, October 2016

GREEK ECONOMIC OUTLOOK



- **Macroeconomic analysis and projections**
- **Public finance**
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Issue 31 - October 2016

Editorial

The 31st issue of KEPE's *Greek Economic Outlook* is published at a time when there is a general "wait and see" stance in view of the completion of the second evaluation of the consolidation program and the disbursement of the second tranche of the loan agreement, the submission of the 2017 State Budget, the Medium-Term Fiscal Strategy and the ongoing discussions concerning Greek debt relief. In this context, discussion is now focused on whether the Greek economy will recover in 2016 and what will be the level of growth in 2017. KEPE's *Greek Economic Outlook* contributes to this discussion not only through its periodic projections for GDP in 2016, but also through articles covering crucial current issues and policy proposals.

The articles presented in Part One of the journal address recent developments and prospects in the main demand components, the evolution of the Consumer Price Index (CPI) in Greece and the Eurozone, and the factor model forecasts for the short-term prospects of GDP. Public finances are examined through an analysis of the 2016 State Budget execution (January-August) as well as the evolution and structure of public debt. Recent developments in key variables of the Greek labour market are also discussed. Finally, as far as sectoral policies are concerned, the articles examine the Transport Services Balance (analysis by mode of transport), the Greek banking system and its role for resetting the Greek economy (preconditions for the complete lifting of capital controls), an analysis of tourism trends in Greece, and an analysis of the industrial sector based on industrial production and turnover indices.

Part Two of the journal hosts four in-depth and specialised articles that focus on important current topics. Specifically, the first article examines "The homogeneity of the NPLs determinants in the different categories of loans". The second article analyses the "Technical efficiency evaluation of health care systems in OECD countries", while the third discusses the "Refugee and immigrant flows and their expected consequences on the Greek labour market". Finally, the fourth article examines the issue of "Greece and Germany: Policy and efficiency of Tobacco Taxation".

RITSA PANAGIOTOU
Editor

1. Macroeconomic analysis and projections

1.1. Recent developments and prospects in the main demand components

Ersi Athanassiou

According to the latest seasonally adjusted data of the quarterly *National Accounts* (ELSTAT, provisional data, August 2016), the GDP of the Greek economy remained on a downward course during the first half of 2016, recording a decrease of -1.0% in the first quarter and -0.9% in the second quarter of the year, as compared to the corresponding quarters of 2015 (Table 1.1.1). Nevertheless, significant changes were recorded in the second quarter of 2016 both with respect to developments in the main demand components and with reference to the emergence of a positive quarter-on-quarter rate of change of the GDP (0.2%) that perhaps signifies a marginal improvement in economic conditions.

More particularly, on the domestic demand side, investment activity appears to have been positively affected by the gradual normalisation of economic conditions, as the downward trend exhibited by investment expenditure in the first quarter of 2016 was reversed in the second quarter of the year, with the relevant positive rate of change reaching 7.0%. However, the gradual adoption of the fiscal consolidation measures foreseen in the country's financing program contributed to an acceleration of the decline in private consumption, as well as to a significant reduction in public consumption. Overall, the decrease in domestic demand –excluding inventories– stood at -1.4% in the first quarter and -0.9% in the second quarter of 2016, resulting in a negative contribution to GDP growth amounting to -1.5 and -0.9 percentage points, respectively (Figure 1.1.1).

TABLE 1.1.1 Main macroeconomic aggregates

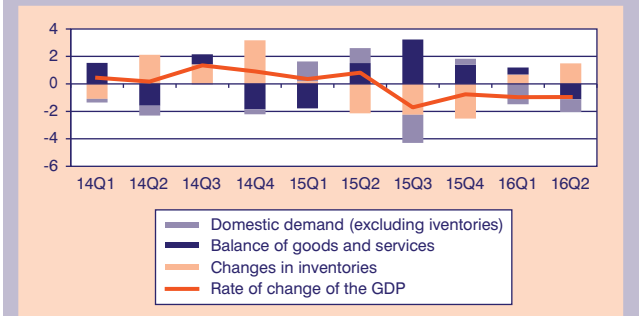
% rates of change compared to the corresponding period of the previous year (seasonally adjusted data at constant prices)

									6 month period Jan.-June	
	2014Q3	2014Q4	2015Q1	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2	2016	2015
Private consumption	0.7	0.9	0.7	1.6	-0.3	-0.9	-1.0	-1.7	-1.4	1.2
Public consumption	-3.5	-8.1	0.4	-1.5	-1.9	2.8	-2.6	-2.7	-2.6	-0.6
Gross fixed capital formation	2.8	3.4	10.3	0.1	-11.7	5.4	-2.5	7.0	2.0	5.2
Domestic demand*	0.0	-0.3	1.4	1.1	-2.0	0.4	-1.4	-0.9	-1.2	1.2
Exports of goods and services	9.1	10.3	3.7	1.5	-10.5	-9.2	-11.5	-11.4	-11.4	2.6
Exports of goods	2.3	11.1	5.7	2.2	1.7	3.3	1.7	2.9	2.3	3.9
Exports of services	16.5	9.7	1.5	0.9	-23.8	-21.9	-23.7	-26.5	-25.1	1.2
Imports of goods and services	6.0	16.2	9.3	-3.3	-19.8	-12.5	-11.9	-7.1	-9.6	2.8
Imports of goods	6.8	17.7	8.6	-4.0	-16.4	-10.4	-8.2	-3.3	-5.8	2.1
Imports of services	1.6	9.6	12.2	-0.3	-35.1	-21.2	-25.5	-22.6	-24.1	5.9
Balance of goods & services	-27.0	130.2	106.0	-43.6	-166.5	-43.2	-14.9	57.3	11.2	5.1
GDP	1.3	0.9	0.4	0.8	-1.7	-0.8	-1.0	-0.9	-1.0	0.6

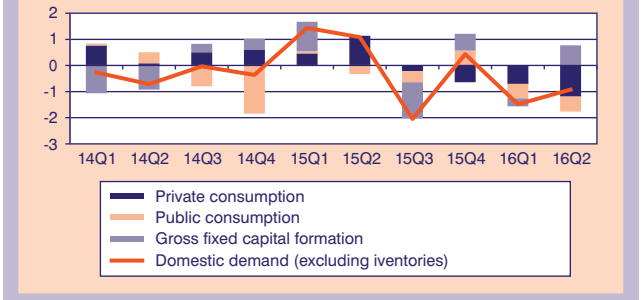
Source: National Accounts, ELSTAT (August 2016), own calculations.

* Excluding the change in inventories.

FIGURE 1.1.1
Contributions to the rate of change of the real GDP
Domestic and net external demand

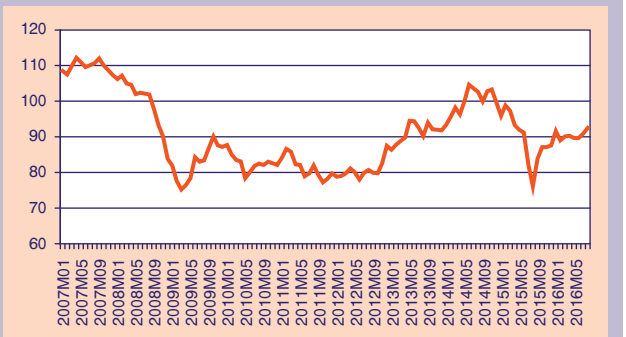


Individual components of domestic demand



Source: National Accounts, ELSTAT, own calculations.

FIGURE 1.1.2
Economic sentiment indicator



Source: EUROSTAT.

With respect to developments in the external sector, the consequences of the capital controls on Greece's external trade appear to have eased to a certain extent during the first half of 2016, as the rate of decline of goods imports as compared to the corresponding period of the previous year moderated significantly. In parallel, goods exports continued to increase, although the persistent liquidity problems in the economy inhibited a more dynamic improvement in this sector. With respect to imports and exports of services, the relevant figures remained on a rapid downward track during the first half of 2016, mainly due to the trends in the ocean shipping market and the problems related to the exacerbation of the refugee crisis. Overall, as a result of the aforementioned developments, the contribution of the external sector to the rate of change of the GDP was limited to 0.5 percentage points in the first quarter of 2016 (versus 3.2 and 1.4 points in the third and fourth quarter of 2015, respectively), while in the second quarter of 2016 this contribution fell to the negative level of -1.1 percentage points.

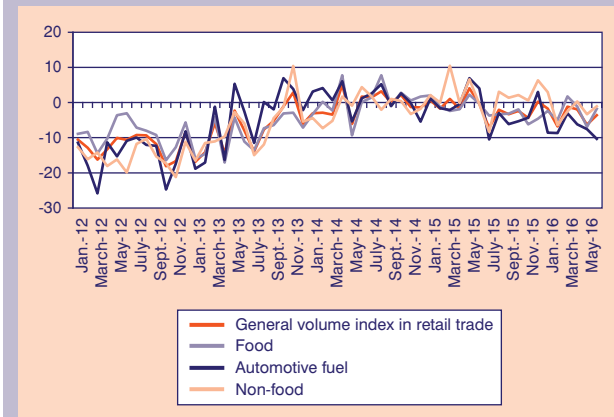
From the aforementioned developments in the contributions of domestic demand and the external sector it becomes evident that changes in inventories played an important role in curbing the decline in GDP during the first half of 2016. More particularly, the gradual restoration of normality in the flow of imports led to a suspension of the phenomenon of rapid consumption of stocks that took place from the second until the fourth quarter of 2015, and allowed businesses to proceed with replenishing their stocks. As a result, the change in inventories had a substantial positive contribution to the rate of change of the GDP both in the first and in the second quarter of 2016 (0.7 and 1.5 percentage points, respectively).

Focusing on the available indications with respect to the course of economic activity during the latest period, the economic sentiment indicator remained relatively stable in the second quarter of 2016, thereafter recording an improvement in July and August (Figure 1.1.2). This development appears to lend support to the aforementioned indication for a gradual improvement of the general economic conditions in the country. However, more qualified conclusions with reference to the recent developments and prospects of the economy can be derived on the basis of the subsequent more detailed analysis of *National Accounts* data and selected short-term indicators.

1.1.1. Private consumption

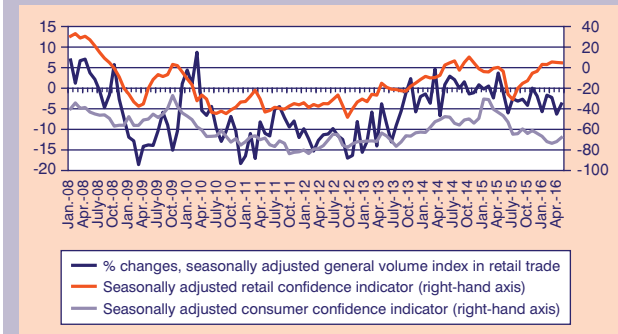
According to *National Accounts* Data, the downward trend to which private consumption reverted in the second half of 2015 continued in the first half of 2016, with the relevant rate of change amounting to -1.0% in the first quarter and -1.7% in the second quarter of the year. Additional indications on the recent course of private consumption are provided by the relevant trends with respect to the monthly volume index in retail trade. The index moved consistently downwards from January until June of 2016 as compared to the corresponding months of 2015, thus recording in the first

FIGURE 1.1.3
Percentage changes in the general volume index and the main sector indices in retail trade on a year-on-year basis



Source: ELSTAT, own calculations.

FIGURE 1.1.4
General volume index in retail trade and confidence indicators



Source: ELSTAT, EUROSTAT, own calculations.

half of 2016[1] an overall decline of about -3.6% against the corresponding period of the previous year. Negative contributions to the development of the general index came from the side of all three main retail sector categories, with the most severe negative percentage change recorded in the *automotive fuel* sector (-7.5%) and comparatively more moderate negative changes being observed in the *food* sector (-2.6%) and the *non-food* sector (-1.7%) (Figure 1.1.3).

The above trends in retail trade are further mirrored in the evolution of the indices in the eight specific store sub-categories, where in six out of the eight cases the first half of 2016 was characterized by negative developments. In particular, the indices referring to the *supermarkets*, *automotive fuel*, *food-beverages-tobacco*, *pharmaceuticals-cosmetics*, *furniture-electrical equipment-household equipment* and *books-stationery-other books* sub-categories recorded negative rates of change during this period (amounting to -2.7%, -7.4%, -0.1%, -3.9%, -3.9% and -0.6%, respectively), as compared to the corresponding half-year period in 2015. On the contrary, the volume indices in the *department stores*, and *clothing-footwear* sub-categories increased (by 5.4% and 3.6%, respectively).

The aforementioned developments are largely related to the fiscal consolidation measures implemented or anticipated in compliance with the obligations defined in Greece's current financing programme. It appears that during the particular period examined the direct pressures on household disposable income from the implementation of recent measures, but also the apprehension of consumers in view of the imposition of additional burdens on them in the future, prevailed over the possible positive effects on consumption from the gradual stabilization of the economic environment and the slow but consistent improvement of conditions in the labour market.

With respect to the prospects of private consumption, a significant negative role in the short-term will continue to be played by the adverse impact on household disposable income, in the framework of implementation of the fiscal measures foreseen in the financial assistance programme. On the other hand, the smooth progress of the programme will secure to a large degree the further reduction of uncertainty in the economy, and the establishment of the stability and safety conditions required for the definitive recovery of private consumption to viable rates of growth. In any case, improved expectations with respect to the course of private consumption are already exhibited by retailers, with the retail confidence indicator following an upward trend, and reaching 9.3 points in August from -3.4 points in January 2016. In contrast, consumers remain more apprehensive with respect to the course of their consumption expenditure, with the consumer confidence indicator subsiding from -63.9 points in January to -73.7 in April 2016, thereafter exhibiting volatility and reaching -70.1 points in August 2016 (Figure 1.1.4).

1.1.2. Investment

Gross fixed capital formation declined by -2.5% in the first quarter of 2016, but recovered afterwards by a significant 7.0% in the second quarter, as compared to the corresponding quarters of the previous year (Table 1.1.2). As a result, the contribution of investment to the

1. All the following references to the six-month period include provisional data for the month of June.

rate of change of the GDP amounted to -0.3 percentage points in the first quarter of 2016 and 0.8 points in the second quarter.

More particularly, with regard to investment other than construction, developments in the course of the first half of 2016 were on the whole unfavourable, with this picture being reversed in the second quarter of the year. More particularly, expenditure in transport equipment recorded a decline in the first quarter (-4.6%) and a major increase in the second quarter (31.9%), while investment in other products exhibited a small decrease in the first quarter (-0.7%) and a slight increase in the second quarter of the year (0.6%). In parallel, expenditure in machinery and equipment presented a decline in the first quarter (-2.8%) and a further marginal decrease in the second quarter (-0.5%), while to the same direction was also the evolution of investment in Information and Communication Technology (ICT), which exhibited a significant decline in the first quarter (-10.8%) and a marginal decrease in the second quarter (-0.8%).

Concerning investment in construction, a notable favourable development was the increase of expenditure in the other constructions category, both in the first quarter (4.0%), and in the second quarter of 2016 (7.1%). On the other hand, however, investment in dwellings continued to decline rapidly (by -17.1% in the first quarter and -23.5% in the second quarter of 2016).

Additional information on developments in the construction sector as a whole is derived from the available statistical data on the course of the general production index in construction in the first and second quarter of 2016.[2] It is interesting to observe that the unfavorable developments in the index during the first quarter of 2016, expressed by a percentage change of -9.6% as compared to the respective quarter of 2015, were followed by a positive rate of change in the second quarter, amounting to 9.7%. This recovery of the dynamics in the overall construction activity is due to the related reversal in conditions characterizing both infrastructure works and building construction. More particularly with reference to the individual sub-index of production of civil engineering (which concerns, among other things, highways, bridges, tunnels, pipelines, networks and port development), a decline by -15.4% in the first quarter of 2016 gave turn to an increase by 11.4% in the second quarter of the year, as compared to the corresponding periods of 2015. In parallel, a similar trend was recorded in the sub-index of production of building construction (concerning, among other things, dwellings, industrial and com-

TABLE 1.1.2 Main investment aggregates

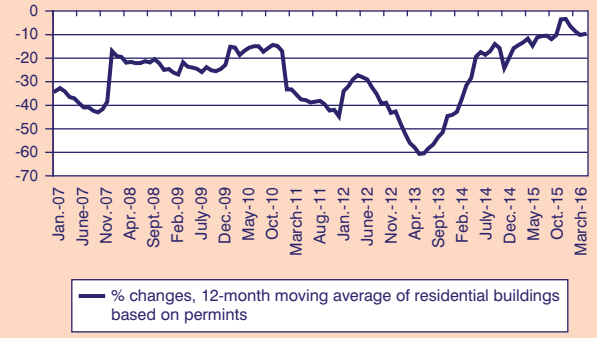
% rates of change compared to the corresponding period of the previous year (seasonally adjusted data, constant prices)

	Quarters						6 month period Jan. - June	
	2015Q1	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2	2016	2015
Cultivated assets	-17.1	-35.9	-34.8	-29.5	4.4	4.1	4.2	-28.0
Other machinery and equipment and weapon systems	22.1	10.7	-12.1	3.2	-2.8	-0.5	-1.6	16.2
Transport equipment and weapon systems	97.1	22.9	-13.8	-0.9	-4.6	31.9	11.5	55.7
Information Communication Technology (ICT) equipment	33.2	5.2	-13.5	3.4	-10.8	-0.8	-5.9	18.1
Dwellings	-30.6	-8.4	-34.0	-16.4	-17.1	-23.5	-20.3	-20.9
Other construction	-12.4	-10.1	-10.2	7.0	4.0	7.1	5.6	-11.3
Other products	-0.9	-0.1	-0.9	1.4	-0.7	0.6	-0.1	-0.5
Gross fixed capital formation	10.3	0.1	-11.7	5.4	-2.5	7.0	2.0	5.2

Source: National Accounts, ELSTAT (August 2016), own calculations.

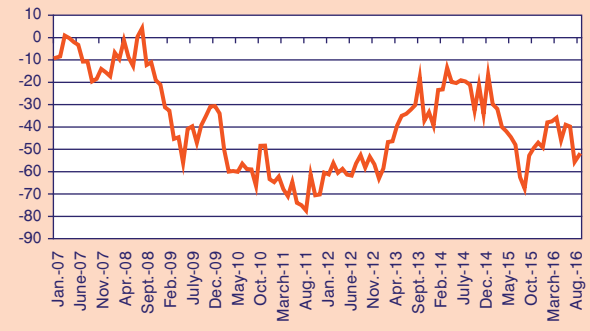
2. Note that the reference concerns the indicator adjusted for the number of working days, while data for the second quarter of 2016 are provisional.

FIGURE 1.1.5
Estimated residential building activity based on permits



Source: EUROSTAT.

FIGURE 1.1.6
Construction confidence indicator



Source: EUROSTAT.

mercial buildings and other buildings), as the decline in the index by -2,6% in the first quarter of 2016 was reversed, with the index increasing by 7.7% in the second quarter of the year.

More particular information with regard to the recent developments in residential investment is derived from the residential buildings indicator with respect to square meters of useful floor area, based on building permits. Both the individual monthly observations of the residential buildings indicator and the estimated private building activity[3] exhibited significant weakening in the most recent reference period. More specifically, with the exception of April, the monthly percentage changes of the indicator on a year-on-year basis were consistently negative, falling to even -30.3% (January). Correspondingly, the negative rates of change in the estimated private building activity were aggravated progressively, from -3.4% in January to -10.1% in April and -9.8% in May (Figure 1.1.5).

Overall, the observed improvement in most investment categories during the second quarter of 2016 is related to the progressive return to more normal economic conditions, the unwinding of uncertainty with respect to Greece's European prospects, the resulting gradual recovery of investors' confidence, and the progress with respect to road works and other construction projects. Nevertheless, the limited extent of recovery in some investment categories, as well as the continuing decline of investment in machinery and equipment, ICT equipment and housing, reflect the serious liquidity and financing problems in the market, as well as the negative effects on investment incentives due to the high taxation of businesses and real estate property.

With respect to the short-term prospects for fixed capital formation, indications for the construction sector on the basis of the construction confidence indicator are mixed, as the rising trend followed by the index from September 2015 to March 2016 was subsequently reversed until July, to be followed by a new small improvement in August (Figure 1.1.6). Nevertheless, more generally, and with the exception of investment in housing, the prospects for investment expenditure in the upcoming quarters appear favourable. This assessment is based on the recovery already observed in some investment categories and the prospects for further improvement of investor confidence, gradual improvement of financing flows in the economy and progress with respect to large investment projects, most notably the flagship project at Hellinikon. However, it must be noted that a key requirement for the fulfilment of these prospects is the smooth implementation of the country's financing programme, and especially the progress with respect to structural changes.

1.1.3. External balance of goods and services

Developments in the main aggregates of the external sector during the first half of 2016 reflect, on the one hand, the improving conditions arising from the progressive stabilization of the Greek economy and, on the other hand, the problems induced both by domestic weaknesses, such as the lack of financing of domestic exporters, and by external factors such as the trends in the ocean shipping market and the developments in the refugee crisis.

3. A twelve-month moving average and the related percentage point changes are calculated.

FIGURE 1.1.7
Contributions to the rate of change of the GDP
Individual components of external demand

Source: National Accounts, ELSTAT, own calculations.

More specifically, with respect to exports, their contribution to the rate of change of the GDP was considerably negative, amounting to -3.2 percentage points in the first quarter of 2016 and -3.4 points in the second quarter, compared to the corresponding quarters of the previous year (see Figure 1.1.7). More particularly, in the field of services exports a major decline was recorded, reaching -23.7% in the first quarter of the year and -26.5% in the second quarter. This decline was largely due to the dramatic decrease in receipts from transportation services (by -44.1% overall in the first half of 2016, according to Bank of Greece data), which was in turn related primarily to the low levels of ocean shipping freights rates, and secondly to the blocking of the railway line at the Greece-FYROM border due to the refugee crisis. Apart from the decline in transportation receipts, other factors contributing to the decline in services exports were the decrease of receipts in the other services category (by -23.7% overall in the first half of the year, according to Bank of Greece data) and the contraction in tourism receipts (by -5.8%, respectively). Turning to goods, exports recorded a small increase in the first quarter of 2016 (1.7%), and a higher increase in the second quarter (2.9%).

With respect to imports, their contribution to the rate of change of the GDP was high and positive, subsiding nevertheless from 3.9 points in the first quarter of 2016 to 2.2 points in the second quarter. More particularly in the field of goods the rate of decline of imports narrowed significantly in the second quarter of 2016 (-3.3%) in comparison to the first quarter of the year (-8.2%), a development reflecting the easing of the consequences of capital controls for external trade, but also, possibly, a tendency for a weakening of recessionary pressures in the economy. In the field of services, imports recoded a major decline both in the first and in the second quarter of the year (-25.5% and -22.6%, respectively), with this development being due mainly to the decrease in payments for transportation and other services.

With respect to the prospects of the external sector, the gradual improvement of the domestic economic environment reinforces the possibility of a reversal of the decline in goods imports, while also creating better conditions for the strengthening of goods exports. On the other hand, the recovery of ocean shipping freight rates in recent months is expected to boost both receipts and payments in the field of transportation services, while the opening of the railway line at the Greece-FYROM border is foreseen to contribute to an increase of both transportation receipts and goods exports. More generally, the evolution of Greece's external balance components in the upcoming quarters is expected to move progressively away from the pattern of the major negative changes associated with the imposition of the capital controls. However, as the demand for imports will tend to recover, the balance of the external sector and its contribution to the GDP will depend critically upon the strengthening of exports, as well as upon the degree to which a possible increase in internal demand will be covered by domestically produced goods. It is clear that in the current conjuncture, a decisive role in the country's performance in the above fields will be played by the implementation of the new investment necessary for the strengthening of the country's productive capacity.

1.1.4. Conclusions and prospects

The above analysis of the main demand components has identified several signs of the enhancement of conditions in the Greek economy, a picture which agrees with the forecasts provided by the KEPE dynamic factor model (see Section 1.3), according to which the Greek GDP is expected to increase in the second half of 2016. On the basis of recent trends, this positive prospect is expected to be supported by a favourable development in gross fixed capital formation. In addition, a gradual stabilization and possibly a small improvement is expected in the short run from the side of private consumption, despite the negative pressures upon the incomes of certain categories of households due to the implementation of measures in the framework of Greece's financing programme. Futhermore, smoother developments in the forthcoming quarters are expected with respect to the components of the external sector, with goods imports tending towards recovery and exports being favoured by the improvement of the domestic environment and by external factors such as the recovery of ocean freight rates.

1.2. The evolution of the Consumer Price Index (CPI) in Greece and the Eurozone

Yannis Panagopoulos

According to the recent recorded trend (August 2016) of the Consumer Price Index (CPI), we observe that deflation still persists in the Greek economy without any clear indication for its final termination. As we can see from the first two columns of Table 1.2.1 and from Diagram 1.2.1, the headline inflation, from April 2016, and its core, from March 2016, continued with negative price changes but with a trend towards zero. Analytically, the headline inflation from -1.5%, in March 2016, was reduced to -0.7% in June 2016 but then it moved back to -0.9% in August. In other words, there is no sufficient evidence for its return to an inflationary ground. Additionally, the core of the headline inflation, from -0.5% in March 2016, crossed to positive changes in June 2016 (0.2%) but then it moved back to negative price changes in July (-0.9%). Thus the core of headline inflation has not convinced us that it could remain in positive territory.

On the other hand, the harmonized inflation in Greece looks like it follows a different path. More specifically, after May 2016, the harmonized inflation appears with positive price changes with a slightly increasing positive trend (from 0.2%, in June to 0.4% in August). The same picture appears for its core harmonized inflation rate, which is also increasingly moving on a positive price change path (see also Table 1.2.1).

Additionally, according to the Hellenic Statistical Authority (ELSTAT), the aforementioned headline deflation rate (-0.9%, y-o-y, in August 2016) can be mainly attributed to subsequent price decreases in six (6) main sub-categories, namely: (a) the "Housing" category (by 4.2%), due to reductions in the price of house rents as well as due to reductions in the prices of residential heating, natural gas and electricity,[1] (b) the "Transportation" category (by 3.3%) mainly due to decreases in the price of cars, in gasoline prices, in household heating prices and in the price of some combined public transports,[2] c) the "Education" category (by 1.3%) due to reductions in the fees of the private secondary school, d) the "Clothing and Footwear" category (by 1.2%) due to price decreases on these products, e) the "Recreation and culture" category (by 1.1%) mainly due to decreases in the prices of audio and visual equipment for PCs,[3] f) the "Miscellaneous goods and services" category (by 0.6%), basically due to reductions of the price of haircuts as well as the prices for car and motorcycle insurance[4] and g) the "Food and non-alcoholic beverages" category (by 0.6%), due to price decreases mainly in bread and corn, meat, milk products, fresh fruit, eggs, etc.[5]

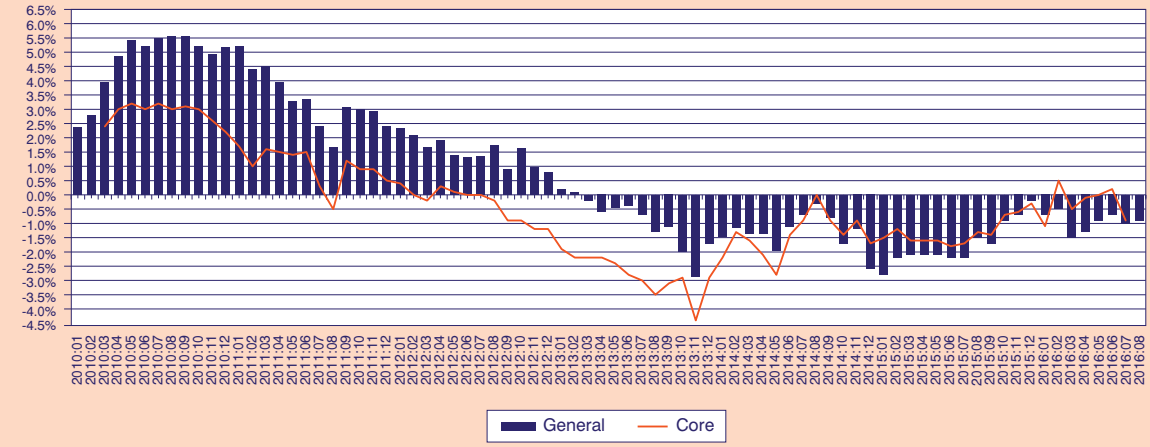
TABLE 1.2.1 Inflation in Greece & in the Eurozone

	Headline inflation (Greece)	Core inflation (Greece)	Harmonized inflation (Greece)	Core harmonized inflation (Greece)	Harmonized inflation (EU19)	Core harmonized inflation (EU19)
2016M1	-0.7%	-1.1%	-0.1%	0.4%	0.3%	1.0%
2016M2	-0.5%	0.5%	0.1%	1.2%	-0.2%	0.8%
2016M3	-1.5%	-0.5%	-0.7%	0.6%	0.0%	1.0%
2016M4	-1.3%	-0.1%	-0.4%	0.9%	-0.2%	0.7%
2016M5	-0.9%	0.0%	-0.2%	0.7%	-0.1%	0.8%
2016M6	-0.7%	0.2%	0.2%	1.1%	0.1%	0.8%
2016M7	-1.0%	-0.9%	0.2%	0.8%	0.2%	0.8%
2016M8	-0.9%	NA	0.4%	1.3%	0.2%	0.8%

Source: ELSTAT, EUROSTAT.

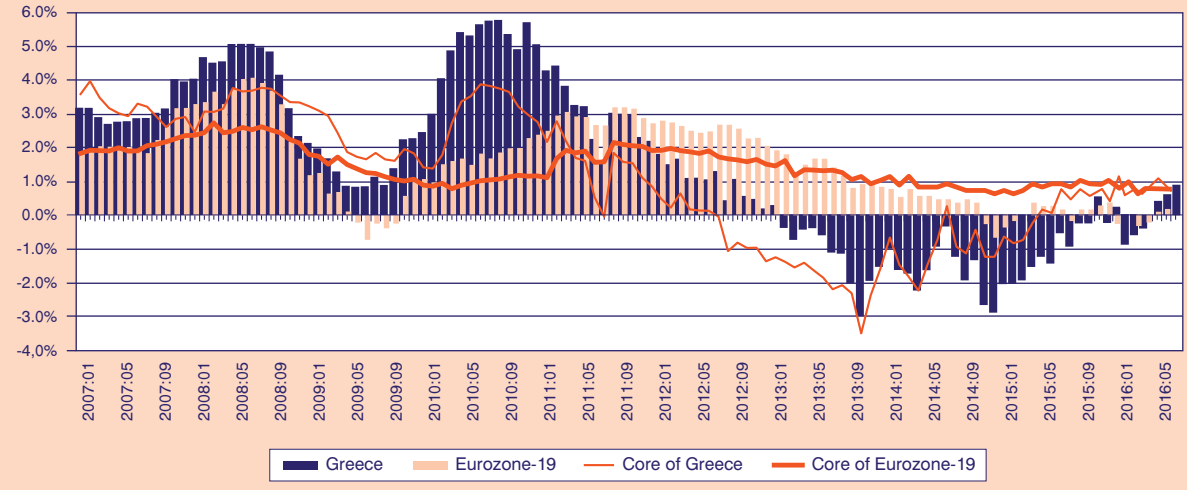
1. Part of this reduction was offset by the increases in prices of solid fuels.
2. Part of this reduction was offset by the increases in prices of airplane tickets, public transport and toll prices.
3. Part of this increase was offset by the increases in the prices of cultural activities.
4. Part of this increase was offset by the increases in the prices of personal care.
5. Part of these increases was offset by the increases in prices mainly of olive oil, fish and fresh vegetables.

DIAGRAM 1.2.1
CPI, % change relative to the respective month of the previous years



Source: ELSTAT, EUROSTAT.

DIAGRAM 1.2.2
Harmonized indices of consumer prices, % change relative to the respective month of the previous years



Source: ELSTAT, EUROSTAT.

Part of the aforementioned deflation process was offset by the increase in the prices mainly of four (4) sub-categories, namely: (a) the "Household equipments" category (by 2.1%) mainly due to increases in household textile products,[6] b) the "Alcoholic, drinks and tobacco" category (by 1.8%) basically due to price increases in these products, c) the "Restaurants-Hotels-Cafés" category (by 1.5%) mainly due to increases in their prices and d) the "Health" category (by 0.3%) especially due to price increases in pharmaceutical products and in private medical services.[7]

Concerning now the headline harmonized inflation rate of the Eurozone (EU-19), we can comment that in the last months it is steadily moving around the zero line (ranging around -0.2% to +0.3%). At the same time period its core (without Energy and Unprocessed Food) was moving around small positive price changes ranging from 0.8% to 1.3%. Thus, during the last months, we observe a steady small difference, between the harmonized inflation rate and its core of almost 0.5%-1.0%, which gradually declines.

6. Part of this increase was offset by the decreases in prices of some large household equipment and some household services.

7. Part of this increase was offset from the decreases in prices regarding medical, dental and paramedical services.

Finally, concerning the core harmonized inflation rates in Greece and the Eurozone, we observe that up to now both are gradually converging towards a small positive price change (between 0.8% and 1.3%). Additionally, as it can be seen from Diagram 1.2.2, a sluggish elimination regarding the difference of the headline harmonized inflation rate of the Eurozone and Greece is observed. However, in the Eurozone, the headline harmonized inflation rate converges towards zero change from the middle of 2015 onwards, while in Greece it appears with small positive changes only recently (from May 2016 onwards). Therefore, the consistency of this convergence –towards some small positive change– will be tested in the time ahead.

BOX 1

The causal relationship between harmonized inflation and its core during the economic crisis: an econometric approach

The purpose of this empirical study is the examination of the causal bi-variate relationship between the core and the headline harmonized inflation in Greece. In other words, we are going to examine which inflation index causes/proceeds which in the Greek economy. The outcome of such causality tests, in the international literature, is linked with the effectiveness of monetary policy (see Bordes & Clerc, 2007; ECB, 2011). These tests are analytically discussed in the ECB *Monthly Bulletin* studies (see ECB, 2013). More analytically, the initial question is whether the deviation of the headline harmonized inflation (Π_t) from its core (either without Energy or without Energy and Unprocessed Food) has some explanatory power for the deviation of present headline harmonized inflation to its future one. This way, as the ECB suggests, we can test for the existence of convergence of the core inflation to either short, medium or long-run headline inflation (of 3, 6, 9 or 12 months, respectively). At the analysis, following the ECB guidelines, we can also test the reversed relationship. In other words, the future convergence of the headline harmonized inflation to its core. So implicitly, with these two empirical tests, we can answer the question, Which of the two variables causes or precedes the other? The algebraic formulation of the aforementioned casual relationship can be expressed in the following two equations:

$$\Pi_{t+h} + \Pi_t = \alpha + \beta\,(\Pi^S - \Pi_t) + \varepsilon_{t+h} \qquad (1)$$

and:

$$\Pi^S_{t+h} + \Pi^S_t = \alpha^S + \beta^S\,(\Pi_t - \Pi^S_t) + e_{t+h} \qquad (2)$$

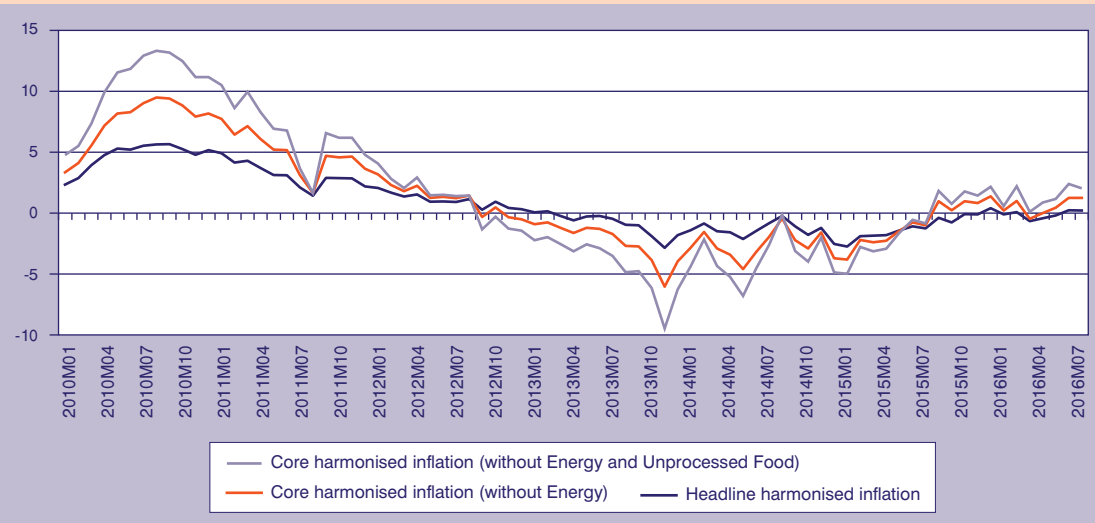
where: Π = the headline harmonized inflation

Π^S = the core harmonized inflation

h = 3, 6, 9 and 12 months.

We could also underline here that in equations (1) and (2), we can also estimate (test) whether $\alpha = 0$ and $\beta = 1$ and also if $\alpha^S = 0$ and $\beta^S = 1$, respectively. According to

DIAGRAM 1
The headline harmonized inflation and its two main cores (2010-2016)



Source: Eurostat.

the empirical results of these coefficients, we could infer whether or not every deviation of the independent variable is being entirely transmitted to the dependent one or not.

In Diagram 1 we analytically present the headline harmonized inflation (Π_t) and the two separate core inflations. Although there are different definitions of the core harmonized inflation (see Clark, 2001; Wynne, 2008), we select two of the most popular used in the literature: the inflation without Energy (Π_t^{S1}) and the inflation without Energy and Unprocessed Food (Π_t^{S2}).

The examined time period ranges from 2009:1 to 2016:7. Table 1a and 1b present the econometric results of equations (1) and (2), respectively.

According to the empirical results, we observe that results of Table 1a are more robust than the corresponding results of Table 1b. More specifically, commencing from the coefficient of determination (R^2), it is obvious that in all the examined cases the regressions of Table 1a are more robust that those of Table 1b (higher R^2). Additionally, in all cases of Table 1b –with the exception of the case when the headline inflation, in the dependent variable, is leading for six months (h = 6)– the explanatory variable is statistically insignificant at 5%. This is valid in both examined cases of the Table. More specifically, when the core inflation does not contains Energy (Π_t^{S1}) and when it does not contain Unprocessed Food and Energy (Π_t^{S2}). We should also report here that in our empirical estimation of the initial ECB model (1) and (2), we have added a time trend (*t*) as a further explanatory variable. This time trend proved to be statistically significant only when h = 3 and h = 6, in Table 1a and when h = 12, in Table 1b. Concerning now the hypothesis regarding the α and β coefficients, we can infer that neither the constant term (α) is equal to zero nor the slope coefficient (β) is equal to one, in Table 1a. We can also observe that in both cases of Table 1a, the longer the time period we used for the perdition for the headline inflation the higher the value of the β coefficient proved to be (over 1).

In summary, it is obvious that equation (1) represents the actual causal relationship between the headline harmonized inflation and its cores in the Greek economy, at least for the time period of crisis. Alternatively, it looks that the deviation of the headline harmonized inflation (Π_t) from its core (especially the core without Energy and Unprocessed Food) has some explanatory power for the deviation of present headline harmonized inflation from its future one.

TABLE 1a The predictive regressions for headline harmonized inflation using the core inflation

Dependent variable	Constant (*c*)	Time trend (*t*)	Independent variabe	R^2
$(\Pi_{t+h} - \Pi_t)$			$(\Pi_t^{S2} - \Pi_t)$	
h= 3 months	2.10 *** (3.33)	-0.03 *** (-3.36)	0.85*** (4.23)	0.20
h = 6 months	2.57 *** (3.58)	-0.04 *** (-3.64)	1.30*** (5.65)	0.37
h = 9 months	1.66 * (1.97)	-0.02 ** (-2.02)	1.34*** (5.65)	0.44
h = 12 months	0.67 (0.79)	-0.01 (-0.75)	1.39*** (5.19)	0.57
$(\Pi_{t+h} - \Pi_t)$			$(\Pi_t^{S1} - \Pi_t)$	
h = 3 months	1.72 *** (2.42)	-0.03 *** (-3.36)	0.71*** (3.13)	0.12
h = 6 months	2.62 *** (3.13)	-0.04 *** (-3.24)	1.28*** (4.82)	0.31
h = 9 months	1.79 (1.80)	-0.03 (-1.92)	1.34*** (4.33)	0.40
h = 12 months	0.77 (0.76)	-0.01 (-0.79)	1.39*** (4.30)	0.53

Note: *,**, *** represent the statistical significance at the 10%, 5% and 1% level, respectively. Additionally, the terms Π_t, Π_t^{S1}, Π_t^{S2} represent the headline harmonized inflation, the harmonized inflation without Energy and the harmonized inflation without Energy and Unprocessed Food, respectively.

TABLE 1b The predictive regressions for core harmonized inflation using the headline inflation

Dependent variable	Constant (c)	Time trend (*t*)	Independent variabe	R^2
$(\Pi^{S2}_{t+h} - \Pi_t)$			$(\Pi_t - \Pi^S_t)$	
h = 3 months	0.69 (1.06)	-0.01 (-0.97)	-0.35* (-1.68)	0.05
h = 6 months	0.92 (1.26)	-0.01 (-1.05)	-0.69*** (-2.95)	0.22
h = 9 months	-0.47 (-0.52)	0.01 (0.78)	-0.52* (-1.85)	0.31
h = 12 months	-2.42*** (-2.56)	0.04*** (3.00)	-0.21* (-0.72)	0.46
$(\Pi^{S1}_{t+h} - \Pi_t)$			$(\Pi_t - \Pi^S_t)$	
h = 3 months	0.21 (0.30)	-0.002 (-0.25)	-0.15* (-0.70)	0.01
h = 6 months	0.47 (0.55)	-0.006 (-0.47)	-0.43*** (-1.59)	0.10
h = 9 months	-0.80 (-0.77)	0.01 (0.89)	-0.29* (-0.92)	0.22
h = 12 months	-2.72*** (-2.47)	0.05*** (2.76)	0.008 (0.02)	0.39

Note: *,**, *** represent the statistical significance at the 10%, 5% and 1% level, respectively. Additionally, the terms Π_t, Π^{S1}_t, Π^{S2}_t represent the headline harmonized inflation, the harmonized inflation without Energy and the harmonized inflation without Energy and Unprocessed Food, respectively.

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1.3. Factor model forecasts for the short-term prospects in GDP

Factor Model Economic Forecasting Unit
Ersi Athanassiou, Theodore Tsekeris, Ekaterini Tsouma

The current section presents the updated short-term forecasts of KEPE concerning the evolution of the rate of change of real GDP in Greece in the last two quarters of 2016 and also the resulting updated forecast for the mean annual rate of change in 2016. The forecasts are produced by implementing a dynamic structural factor model, a detailed description of which can be found in Issue 15 (June 2011) of the *Greek Economic Outlook*. The underlying time series database used to estimate the model and produce the forecasts encompasses the main aspects of economic activity in the country on a quarterly basis, spanning the time period from January 2000 up to June 2016. Specifically, the database incorporates both real economy variables (such as the main components of GDP from the expenditure side, general and individual indices concerning industrial production, retail sales, travel receipts and the labor market) and nominal variables (such as the general and individual consumer price indices, monetary variables, bond yields, interest rates, exchange rates and housing price indices). In addition, the data sample includes a considerable number of variables reflecting expectations and assessments of economic agents (such as economic sentiment and business expectations indicators). It is noted that the seasonal adjustment of all time series is carried out by use of the Demetra+ software, which is freely available from Eurostat.[1]

According to the factor model forecasts presented in Table 1.3.1, and having incorporated published data for the first half of 2016, the mean rate of change of real GDP is estimated at 0.6% for the second half of 2016, with the relevant quarterly projections amounting to 0.9% and 0.3% for the third and fourth quarter, respectively, as compared to the corresponding quarters of the previous year. The respective predictions reflect a small-scale improvement in economic conditions, through the return to positive rates of change of real GDP, following the negative rates recorded in the first six-month period of the year. In parallel, they point to an upward revision relative to the preceding factor model forecast (0.2%) for the same period. Taking into account the respective predictions for the second half of 2016, along with the official data for the first half (adjusted for seasonality via the procedure mentioned above), the mean annual rate of change of real GDP for 2016 is estimated at -0.1%. This forecast signals that the Greek economy will experience a marginal recession in 2016, which nevertheless appears to be more moderate relative to the preceding factor model forecast (-0.4%).

The above presented forecasts of the rate of change of the Greek GDP mirror the central dimensions of the most recent short- to medium-term developments in the economy. More specifically, and after the intense shock the Greek economy suffered in 2015, with its implications being felt mostly during the first six months

TABLE 1.3.1 Real GDP rate of change *(%, y-o-y)*

Year	**2016**	
Quarters	2016Q3	2016Q4
Quarterly rate of change	0.90 [0.83 , 0.98]	0.25 [0.12 , 0.38]
Six-month mean rate of change, 2nd half year	0.57 [0.47, 0.67]	
Annual mean rate of change*	-0.05 [-0.10 , 0.00]	

Note: Values in brackets indicate the lower and upper boundaries of the 95% confidence interval of the forecasts.

* The figure incorporates officially available (provisional) data for the first two quarters of 2016, which have been adjusted for seasonality using the Demetra+ software.

1. The TRAMO/SEATS filter was used for the seasonal adjustment.

of 2016, the evidence suggests a course towards a transition period characterized by stabilizing conditions and a moderate recovery in the second half of the year. One of the major factors contributing to the direction of smoothing economic conditions, in particular relative to the developments in the summer of 2015, is the gradual containment of uncertainty concerning the European prospects and the financial assistance programme of the country and, more generally, the financing and growth potential of the Greek economy. At the same time, the key reasons justifying the forecast that Greece will go through another year of –albeit marginal– recession, lie in two basic aspects of the developments in the domestic economy: (a) the difficulties and outstanding matters with reference to the resolution of the key internal and external issues (such as the rebalancing of public finances, the promotion of the necessary structural reforms, the strengthening of production capacity, the fight against unemployment, the management of the refugee and migrant flows, etc.), but also (b) the strict and narrow limits set by economic policy, within the framework of the agreed financial assistance programme, along with all the resulting burdens and constraints facing domestic households and enterprises. In addition, it becomes obvious that any failure to find effective solutions in order to address the aforementioned issues implies additional delays in creating a favourable domestic economic environment, in that way hindering the dynamic enhancement of the major macroeconomic aggregates and the achievement and preservation of fiscal balances and, in particular, impeding the radical confrontation with the adverse conditions still prevailing in the labour market.

The above assertions are in line with the observed course in economic variables and, especially, with the most recent statistical data concerning the first two quarters of 2016. Examining in detail the additional information content incorporated in the respective observations (on a non-seasonally adjusted basis), three main categories can be distinguished: (a) economic variables which deteriorated in both the first and second quarter of 2016, as compared to 2015, such as household consumption expenditure (albeit to a lesser extent in the second quarter), services exports, imports, the turnover index in industry (with respect to both the internal and external market), the volume index in retail trade, transport receipts (accompanied by a significant fall in transport payments), building activity on the basis of permits issued, the turnover index in wholesale trade, the General Index in the Stock Exchange Market, and the economic sentiment indicator for Greece, (b) economic variables which picked up in the second quarter of 2016, as compared to 2015, in contrast to their fall in the first quarter of the year, such as investment, the industrial production index, the production index in construction, and the turnover index for motor trade and (c) economic variables which followed a positive path in both the first and second quarter of 2016, such as goods exports, new orders in recent months in industry, private passenger cars licenses, the spread against German bond yields, business expectations, indicators reflecting expectations for new orders and exports and, in particular, the key labour market aggregates (employment as a whole, but mainly in the secondary and tertiary sector of the economy, and unemployment as a whole and with regard to long-term unemployment and the newly unemployed). The course of travel receipts is further worth mentioning, since they increased in the first but dropped in the second quarter of 2016, as compared to 2015, while mixed evidence is provided with regard to competitiveness indicators.

The forecasted course of the real GDP for the second half of 2016 and, hence, for the whole year, might evolve towards a more or less favourable direction than projected, depending on the occurrence of certain crucial and decisive developments relating to a broad spectrum of factors. These mainly concern the definite establishment of a domestic environment reflecting confidence and credibility to ensure the attraction of investment, the recovery of consumer confidence, the smooth financing of the Greek economy, but also to reverse the conditions currently in force which continue to impede business activity and prevent the stabilization of household incomes. At the same time, the role played by international economic and political developments should not be neglected, and in particular the critical issue of the refugee and migrant flows the country faces.

2. Public finance

2.1. State Budget execution, January-August 2016

Elisavet I. Nitsi

According to the most recent data retrieved from the General Accounting Office,[1] on a modified base, the execution of the State Budget in the period January-August 2016 shows a slight improvement compared both to the corresponding period of 2015, and to the targets set, as they were reflected in the executive summary of the State Budget for the fiscal year 2016. More specifically, according to the data shown in Table 2.1.1, the State Budget had a deficit in the balance amounting to 1.04 billion euros, showing a small reduction of 69 million euros compared to the corresponding period of 2015, and 2.85 billion euros in comparison with the target set. The State Budget Primary Balance had a surplus of 3.8 billion euros less by 42 million euros compared to the same period in 2015, while it was significantly higher, by 2.78 billion euros, from the primary deficit target.

Moreover, State revenues are increased compared to the corresponding period of the previous year, amounted to 31.95 billion euros, increased by 1.19 billion euros or 3.85%, while they are lagging compared to the target set for revenues, which was set at 36.41 billion euros, which is a loss of 1.2 billion euros or 3.87%. The

TABLE 2.1.1 State Budget execution January-August 2016 (million €)

	Jan.-Aug. 2015	Jan.-Aug. 2016		2015	2016
	Outcome	Outcome	Targets[1]	Outcome[2]	Budget[3]
State Budget					
Net Revenue	30.765	31.950	32.534	51.421	53.527
Expenditures	31.869	32.985	36.414	54.951	55.751
Ordinary Budget					
Net Revenue	28.699	29.883	31.086	46.589	49.107
Expenditures	30.306	30.813	33.359	48.545	49.001
- Primary expenditure	24.720	25.581	27.585	41.298	41.861
- Interest payments (on a cash basis)	4.902	4.791	4.860	5.800	5.930
Public Investment Program (PIP)					
Revenue	2.067	2.067	3.115	4.832	4.420
Expenditures	1.563	2.172	3.055	6.406	6.750
State Budget Primary Balance[4]	3.798	3.756	980	2.270	3.706
State Budget Balance	-1.104	-1.035	-3.880	-3.530	-2.224

Source: General Accounting Office, Greek Ministry of Finance.

Notes:
1. Targets as they were reflected in the executive summary of the State Budget for the fiscal year 2016.
2. The total revenue and expenditure outcome is preliminary and will be finalized after the vote of 2015 annual Budget report (for both revenue and expenditure).
3. Annual estimates as depicted in the executive summary of 2016 Budget.
4. + surplus, - deficit.

1. Based on preliminary data published in the State Budget Execution Monthly Bulletin: August 2016, General Accounting Office, September 2016.

increased revenues in relation to the corresponding period of last year can be attributed to the increased Ordinary Budget revenues, amounted to 29.88 billion euros, while the undershooting of the State Budget revenues compared to the target set is due both to the reduced Ordinary State Budget revenues by 1.2 billion euros or 3.87%, as well as to the significant shortfall in revenue of the Public Investment Program (PIP) by 1.05 billion euros or 33.64% versus the target set by the 2016 State Budget. It should be noted that the reduced PIP revenues for this period are due to the delay of EU funds inflows, for which provision was made in the Budget.

On the other hand, the State Budget shows an increase in expenditure, amounted to 32.99 billion euros, up by 1.12 billion euros or 3.5% over the eight months of 2015, while they are reduced compared to the target set by the State Budget of 2016, falling short by 3.43 billion euros or 9.42%. This increase in expenditure is due both to the increase of the Ordinary Budget expenditure (3.5% compared to the corresponding period last year), as well as the PIP (38.96%). We should take into account that expenditures for the period under consideration are lower than the target set by the 2016 Budget, -9.42% for the Ordinary State expenditure and -28.90% for the PIP expenditure. The increase in the Ordinary State expenditures is due to an extra 292 million euros for hospital grants, 120 million for emergency financial assistance to address the humanitarian crisis, 138 million euros for agricultural subsidies and 49 million euros for large families allowances.

More specifically, the expenditure of the Ordinary Budget amounted to 30.81 billion euros, increased by 507 million euros versus the same period of 2015, while they are less by 2.55 billion euros against the target. The reduction of the Ordinary Budget expenditure can be attributed to both the reduction in primary expenditure, which amounted to 25.58 billion euros, compared to the same period in 2015, by 861 million euros or 3.48%, while they are decreased compared to the target set by 2.0 billion euros or 7.26%. To the contrary, interest paid, amounting to 4.79 billion euros, is reduced by 111 million euros or 2.26% compared to the corresponding period of 2015, as it decreased by 2.12 billion euros or 44.48%, while appears slightly decreased against the target by 69 million euros or 1.42%.

From the figures of the State Budget execution it arises that in the first eight months of 2016 a higher primary surplus than the estimate made by the 2016 State Budget was achieved. This development is mainly due to the General Government's expenditure restraint. Moreover, the fact that we are close to reaching an agreement on the second assessment of the economic adjustment program with the country's lenders, as all the prerequisites have been already passed by the parliament, the disbursement of the sub-tranche from the ESM will lead to greater stability of the Greek economy. Additionally, the refinancing of the market due to the disbursement of the tranche, with both the settlement of arrears, as well as the reimbursement of tax returns to legal entities and personal income tax returns would lead the Greek economy back to growth. Finally, the new development plan of the country in connection with the privatization program could be the levers that will drive the economy out of recession.

2.2. Evolution and structure of public debt

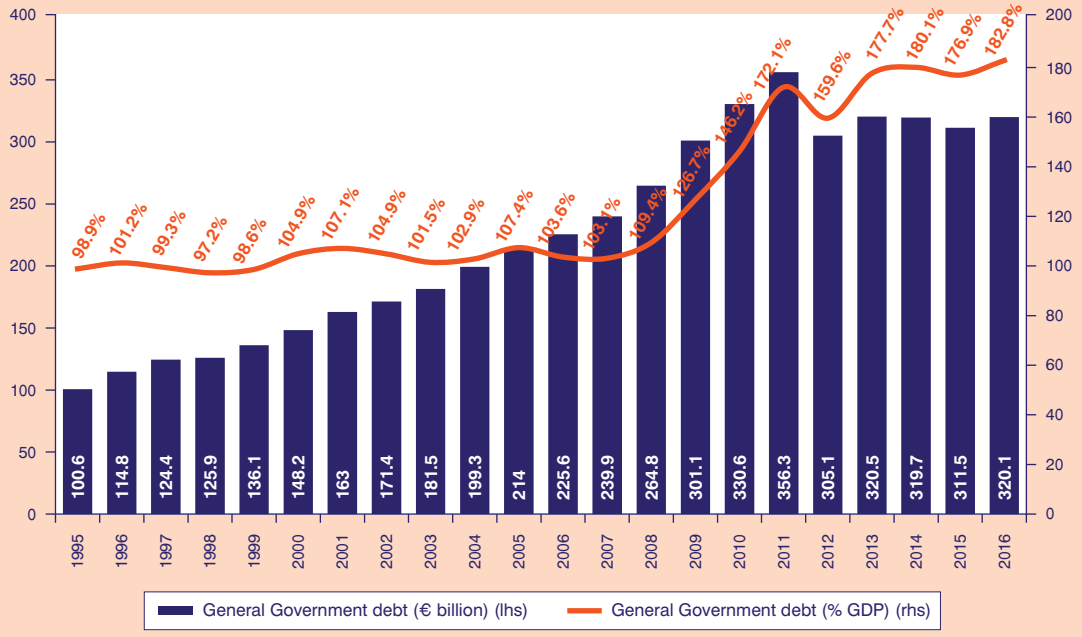
Christos Triantopoulos

The evolution of public debt in the coming years will be determined both by the fiscal and macroeconomic situation of the country and by the measures taken regarding the strengthening of its sustainability in the context of the economic adjustment program of the EU/ECB/IMF support mechanism. Alongside the various scenarios of sustainability analysis, public debt is estimated in 2016, according to the European Commission, to stand at €320.1 billion or 182.8% of GDP, which is the highest historical level in GDP terms (Figure 2.2.1). This level is lower than the Budget 2016 forecast, according to which the debt of 2016 would stand at €327.6 billion or 187.8% of GDP. And this is due to the upward revision –as estimated in the relative analysis of issue 29 of *Greek Economic Outlook*[1]– of the 2015 public debt, which, according to the European Commission, amounted to €311.5 billion or 176.9% of GDP.

Alongside the developments at the general government level, in central government terms, i.e. not taking into account the intergovernmental debt (the short-term loans through repos agreements with general government entities), the debt stood at the end of July 2016 at €324.7 billion, increased by €3.4 billion compared to 2015. Concerning the structure of the central government debt, as shown in the data of the first seven months of 2016, the largest share consists of loans under the EU/ECB/IMF support mechanism, which, after the conclusion of the first review of the third program and the continuation of financial flows, increased compared to 2015 by about €5 billion, reaching €225.5 billion (Table 2.2.1). This source of funding covers 69.4% of the total debt of the central government (Figure 2.2.2). On the other hand, the share of central government debt reflected in bonds maintained its downward trend, reaching €57.1 billion in July 2016 (from €59.8 billion in 2015), representing 17.6% of the central government debt.

Additionally, the central government funding is kept at the same level through short-term securities and, in particular, public treasury bills, which remain constant at €14.8 billion. In contrast, short-term loans increased by exploiting the sales of securities through

FIGURE 2.2.1
General Government debt, 1995-2016



Source: European Commission (2016).

1. For further information see: http://www.kepe.gr/images/oikonomikes_ekselikseis/oikonomikes_ekselikseis_gr_29_full.pdf

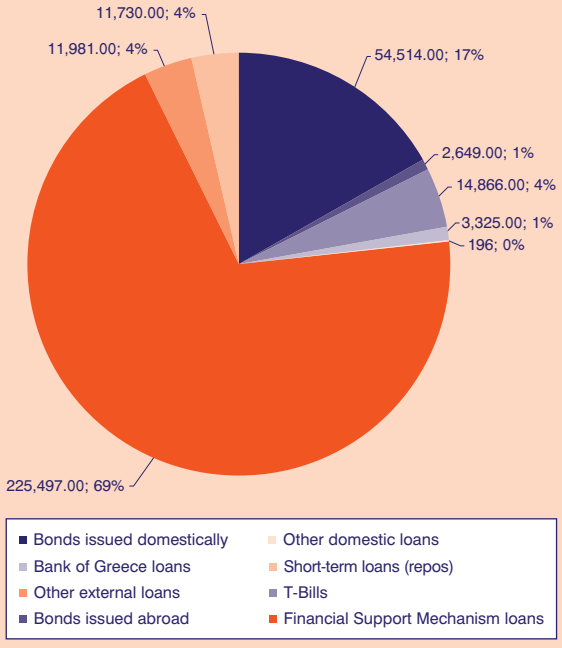
TABLE 2.2.1 Structure of Central Government debt

	2011		2013		2015		July 2016	
	€ million	% of debt	€ million	% of debt	€ million	% of debt	€ million	% of debt
A. Bonds	**259,774.18**	**70.6**	**76,296.25**	**23.7**	**59,818.00**	**18.6**	**57,163.00**	**17.6**
Bonds issued domestically	240,940.37	65.5	73,415.28	22.8	57,112.00	17.8	54,514.00	16.8
Bonds issued abroad*	18,833.81	5.1	2,880.97	0.9	2,706.00	0.8	2,649.00	0.8
B. T-Bills	**15,058.63**	**4.1**	**14,970.82**	**4.7**	**14,880.00**	**4.6**	**14,866.00**	**4.6**
C. Loans	**93,145.19**	**25.3**	**230,210.90**	**71.6**	**236,633.00**	**73.6**	**240,999.00**	**74.2**
Bank of Greece	5,683.99	1.5	4,734.61	1.5	3,792.00	1.2	3,325.00	1.0
Other domestic loans	836.71	0.2	115.50	0.0	110.00	0.0	196	0.1
Financial Support Mechanism loans	73,210.36	19.9	213,152.48	66.3	220,431.00	68.6	225,497.00	69.4
Other external loans**	13,414.13	3.6	12,208.31	3.8	12,300.00	3.8	11,981.00	3.7
D. Short-term loans* **	**0.00**	**0.0**	**0.00**	**0.0**	**10,001.00**	**3.1**	**11,730.00**	**3.6**
Total (A+B+C+D)	**367,978.00**	**100.0**	**321,477.97**	**100.0**	**321,332.00**	**100.0**	**324,758.00**	**100.0**

Source: Public Debt Bulletin (December 2011, December 2013) and General Government Bulletin (July 2016).

Notes: * Including securitization issued abroad.
** Including special purpose and bilateral loans.
*** Including repos.

FIGURE 2.2.2
Central Government debt (July 2016), (€ million; % debt)

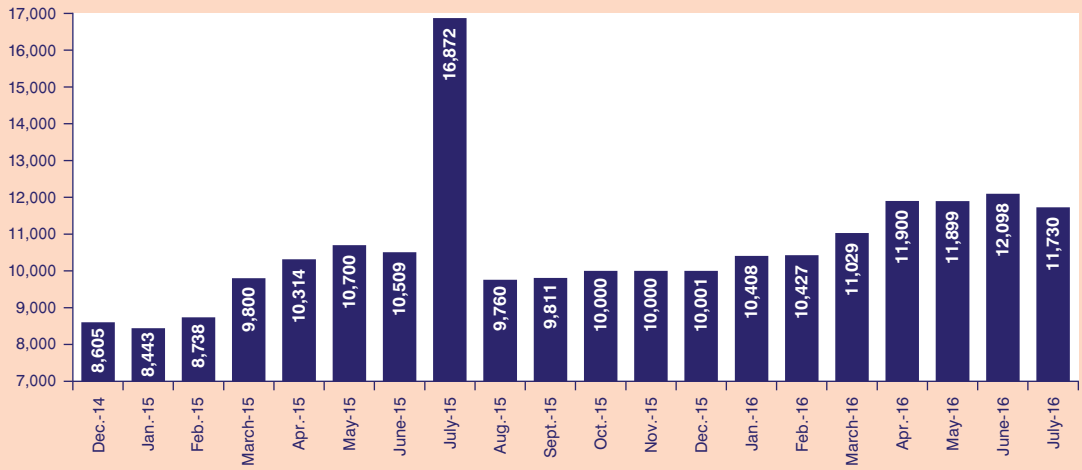


Source: Ministry of Finance, General Government Bulletin (July 2016).

the method of repo agreements with general government entities. In particular, short-term loans by the central government through repos increased in July 2016 to €11.7 billion, constituting 3.6% of the central government debt. This is the second highest rate of use of this liquidity tool, and along with June 2016 (€12.1 billion), it represents the period with the greatest use of this intergovernmental funding method, providing evidence for the conditions regarding the liquidity of the public sector (Figure 2.2.3).

Apart from the structure of the debt of the central government, changes can be identified also in the characteristics of the central government debt in recent years. In particular, in June 2016 (as in December 2015), most of the debt is non-tradable (76.8%) and at floating interest rate (69.1%), reversing in both cases the relative proportions compared to 2011. As noted again, this evolution in the composition of debt is, of course, due to the country's funding from the EU/ECB/IMF support mechanism, which is based on non-tradable and floating rate loans. Also, developments in funding from the EU/ECB/IMF support mechanism in 2015 and 2016 (without IMF participation) also affected the currency's share in which the central government debt is expressed; as a result, in June 2016, 96.7% of this debt is expressed in euro, against 96.5% in December 2015 and 95.9% in December 2013.

FIGURE 2.2.3
Central Government short-term loans (€ million)



Source: Ministry of Finance, General Government Bulletin (various months).

Note: The performance of July 2016 shows a large increase, because it includes the short-term "bridge" loan of €7.16 billion by the European Financial Stability Mechanism that took place between the second and the third adjustment program.

TABLE 2.2.2 Composition of Budgetary Central Government debt

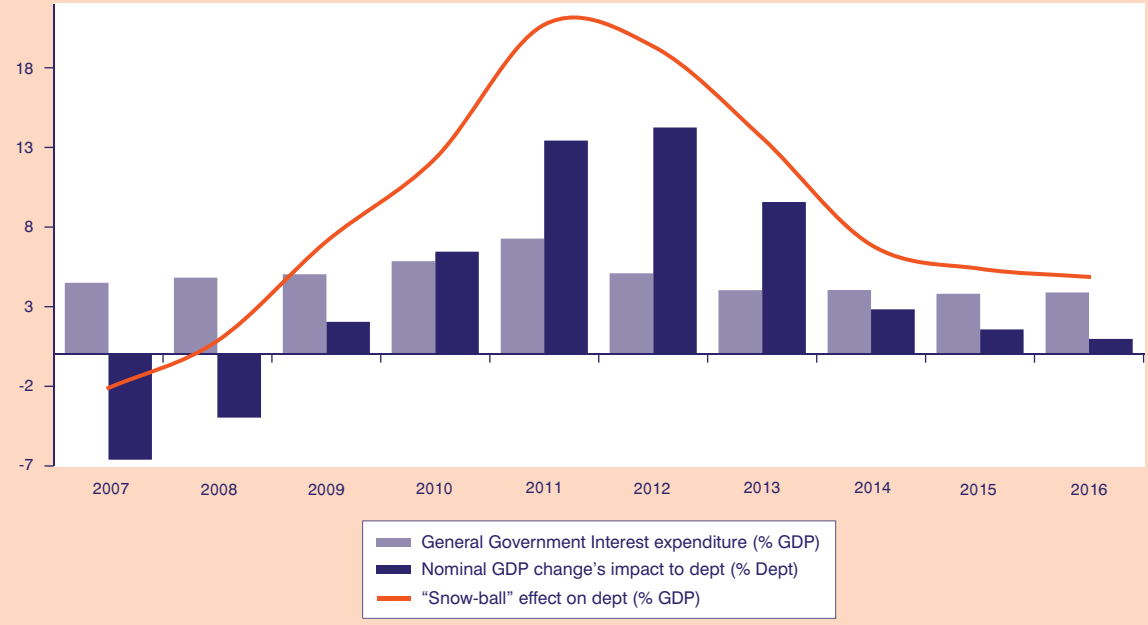
	December 2011	December 2012	December 2013	December 2015	December 2016
A. Rate					
Fixed rate[1]	62.0%	32.7%	28.5%	30.9%	31.3%
Floating rate[1, 2]	38.0%	67.3%	71.5%	69.1%	69.1%
B. Trade					
Tradable	74.7%	34.3%	28.4%	23.2%	23.2%
Non-tradable	25.3%	65.7%	71.6%	76.8%	76.8%
Γ. Currency					
Euro	97.5%	96.7%	95.9%	96.5%	96.7%
Non-euro area currencies	2.5%	3.3%	4.1%	3.5%	3.3%

Source: Public Debt Bulletin (December 2011, December 2012, December 2013, December 2015, June 2016).

Notes: 1. Fixed/floating participation is calculated including Interest Rate Swap transactions.
2. Index-linked bonds are classified as floating rate bonds.

As mentioned above, the evolution of public debt in the coming years will be significantly affected by the forthcoming interventions regarding the strengthening of its sustainability in the context of the economic adjustment program of the EU/ECB/IMF support mechanism. It is estimated that such interventions will, among other things, improve further –after the significant changes that took place regarding the characteristics of financing and public debt in 2012– part of the "snow-ball" effect that has occurred in recent years affecting the sustainability of public debt (Figure 2.2.4). So, a further lightening of the burden from the side of interest expenditure is expected to take place. The challenge, however, remains on the other part of the "snow-ball" effect and, in particular, the impact of changes in nominal GDP. It is crucial this effect becomes negative as soon as possible, so as to contribute positively to the part of the denominator in the reduction of the debt ratio as a percentage of the GDP.

FIGURE 2.2.4
"Snow-ball" Effect in the General Government debt



Source: European Commission (2016).

3. Human resources and social policies

3.1. Recent developments in key labour market variables

Ioannis Cholezas

3.1.1. Introduction

Seasonally adjusted unemployment was approximately 23.8% during the first six months of 2016. This is 1.6 percentage points (pp) lower compared to 2015 and 0.7 pp higher compared to 2013. Consequently, it seems that the unemployment rate continues to drop, a trend first sighted in March 2014. Employment, on the other hand, increased. During the first six months of the year employed individuals increased by almost 1,000 persons compared to the first six months of 2015. As a result, the employment rate increased by one percentage point to 45.7% during the same period, but remained significantly lower compared to the European figure. Women and youth continue to suffer higher unemployment rates. In the first case, men tend to return to employment faster than women, thus expanding the unemployment gap between them. In the second case, although the unemployment rate drops faster amongst youth, they still have a long way to go to approach the levels of unemployment of older individuals.

At first sight, developments in paid employment, which is the most common type of employment, although less common compared to the EU, seem positive. The balance over the last two months, with available data (June and July), was positive and it counterbalanced the losses reported in May. During the first seven months of the year 36% more jobs were created compared with the same period in 2015. The expansion of flexible work arrangements is worrying, i.e. part-time and work-in-shifts, as well as the transformation of full-time work contracts to part-time or work-in-shifts contracts, although compared to 2015 the situation is somewhat improved. Employers seem to prefer men and youth as opposed to women and older individuals, while new jobs are mostly created in sectors related to tourism, a trend which is evident by sectors, occupations and regions that rank at the top of the respective list.

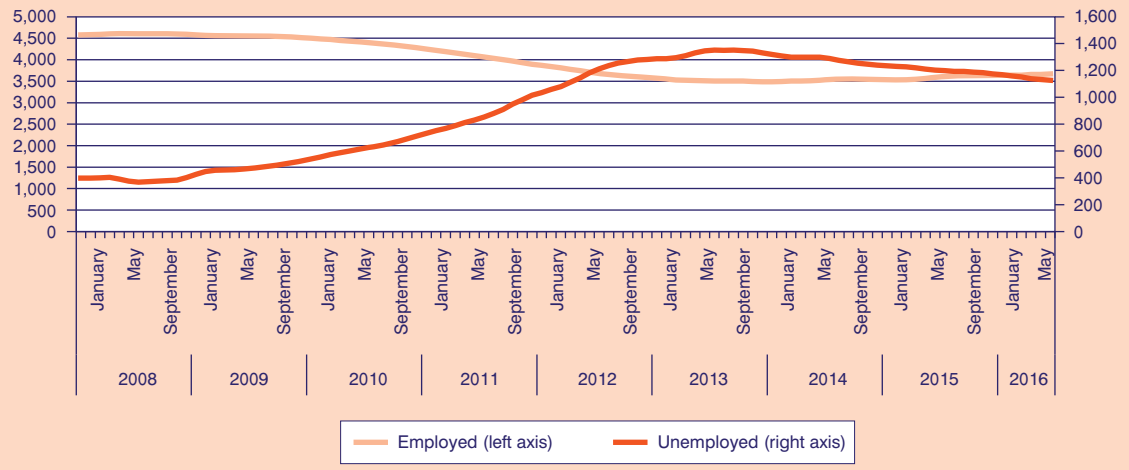
3.1.2. Unemployment and employment

The total number of the unemployed in June 2016 reached 1,124.5 individuals. Consequently, the seasonally adjusted unemployment rate dropped further to 23.4%, marginally lower compared to May and considerably lower compared to June 2015, by 1.5 pp. Therefore, the decrease in the unemployment rate on a year on year (y-o-y) basis that started in March 2014 continued and lead to the parallel reduction in the number of the unemployed in June by 73.5 thousand on a y-o-y basis (-6.8 thousand compared to May). The number of the employed moved in the opposite direction. There were 3,675 thousand employed in June, 61.7 thousand more compared to last June and 15 thousand more compared to May. Despite the increase in the number of the employed, the employment rate remains very low (45.7%), which shows the disproportionate burden employed individuals in Greece have to bear. Note that, according to Eurostat, the employment rate in the EU28 was 58.2% in the first quarter of 2016 compared to 44.7% in Greece.[1] Interestingly, in the first quarter of 2009 the employment rate differential did not exceed 4 pp, while Greek men had a higher employment rate than their European counterparts. Thus, the crisis and its management turned the country back with respect to employment as well.

The lack of balance often observed between the number of unemployed and employed individuals means that unemployment and employment are two variables that move in a similar, but not identical, way. When the number of the unemployed decreases faster compared to the increase in the number of the employed, like it did from January to July 2015 and May and June 2016, then some unemployed stop looking for a job, due to migration, retirement, discouragement, etc. When the opposite happens, then there is a big flow of individuals looking for a job for the first time, i.e. new entrants to the labour force, such as graduates from all levels of education, economically inactive individuals

1. These figures refer to individuals aged 15-74.

GRAPH 3.1.1
Employed and unemployed individuals (three-month moving average, in thousands)



Source: Labour Force Surveys, ELSTAT, KEPE calculations.

Note: The three-month moving average smoothes the excess monthly variance recorded.

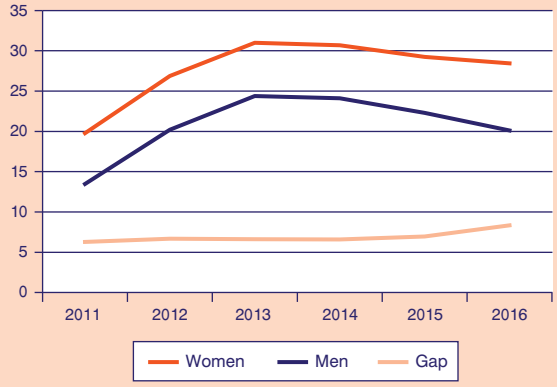
who decided to look for a job, immigrants, etc. Note that a thorough analysis of such flows, which is out of the scope of this article, could facilitate the design of policies for encouraging labour market participation and discouraging dropping out of the labour market. It could, thus, aim at manipulating the supply of labour, e.g. through keeping in the labour market individuals most likely to emmigrate or highly educated individuals, to whom the state has invested a lot of resources.

The unemployment rate continued to be higher for women and youth compared to men and older individuals. The unemployment rate for women in June reached 27.8%, just one percentage point lower than June 2015. The respective unemployment rate for men was 19.8%, two percentage points lower compared to June 2015. It is worth noting, though, that the unemployment differential between men and women increased during the same period from 7 to 8 pp, due to the larger decrease in the male unemployment rate. Similarly, in the first six months of the year the unemployment rate for women reached 28.5% on average and the differential between men and women reached 8.3 pp. This observation verifies that since 2014, when the unemployment rate started to drop, it drops faster for men leading to an expanding gender unemployment differential. To safely describe the determinants of such a phenomenon would take time and effort, although contributing factors often cited in the literature relate to special female characteristics that theoretically make them less productive, e.g. they bear more responsibilities around the house or discrimination against them, cannot be *a priori* rejected.

In the case of youth, usually the term refers to individuals aged 15-24, the unemployment rate in June reached 47.7%, considerably lower than its maximum value in 2013 (59.1%) and half a percentage point lower compared to June 2015. The unemployment rate is lower for the remaining age groups and seems to be reversely related to age. On a y-o-y basis, unemployment fell more for individuals aged 35-44 (-3.3 pp), but they face lower unemployment than the average anyway, and fell somewhat less for individuals aged 25-34 (-2.2 pp). On the contrary, the unemployment rate increased for individuals aged 55-64, which is particularly alarming, considering that these individuals are usually very experienced and close to retirement. Thus, their inactivity constitutes a loss for the labour market. Changes across age groups are similar in the first six months of the year. Therefore, worries about individuals aged 55-64 grow. The only difference is that in this case the maximum decrease in the unemployment rate is recorded for the age group 25-34 (-2.3 pp).

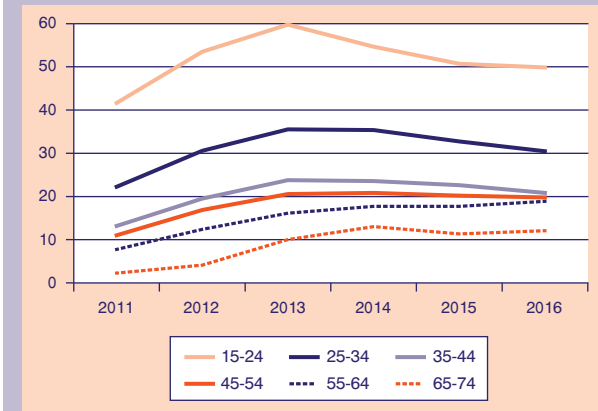
An interesting observation is that compared to 2013, when the highest unemployment rates were recorded, the unemployment rate went down faster for youth (-9.9 pp for group 15-24 and -5.0 pp for group 25-34), while it increased for individuals over 55. This may be related to flexible jobs, like part-time and work-in-shifts jobs, which are widespread amongst paid employees and especially amongst the youth. It could also be related to active labour market policies that target youth very often. For instance, in the first quarter of 2016, 26.8% of youth were working part-time, when

GRAPH 3.1.2
Seasonally adjusted unemployment rate by gender, Q1 (in %)



Source: Labour Force Surveys' monthly data, ELSTAT, KEPE calculations.

GRAPH 3.1.3
Seasonally adjusted unemployment rate by age group, Q1 (in %)



Source: Labour Force Surveys' monthly data, ELSTAT, KEPE calculations.

the respective share for individuals aged 15+ was approximately 9.8%.[2] Lastly, note that the unemployment rate decreased most this April on a y-o-y basis for age groups 15-24 (-4.3 pp) and 25-34 (-3.4 pp). This period happens to coincide with the tourist period, an industry in which youth tend to find jobs more often. It is no surprise that in the first quarter of 2016, 11.3% of those employed in Accommodation and food service activities were youth, when the respective share of all employed was 3.5%. Furthermore, during the same period, 27.2% of youth were employed in the same industry, a share which is far bigger compared to other age groups.

Evidently, unemployment also decreased in six out of seven decentralized administrations in the country on a y-o-y basis. The Aegean islands are an exception, since during the past year (June 2015 - June 2016) the unemployment rate increased by one percentage point. It should be stressed, though, that the Aegean islands continue to have the lowest unemployment rate (18.8%), despite the increase. Moreover, the unemployment rate decreased in Attica (-2.5 pp), without changing its place in the list (5th), in Macedonia-Thrace (-2.2 pp) and in Crete (-1.9 pp), which has the second lowest unemployment rate (following the Aegean islands). The average unemployment rate for this year's

TABLE 3.1.1 Unemployment by decentralized administration (in %)

	June-15	July-16	Difference	2016Q1	2016Q2	Difference
Macedonia-Thrace	25.3	23.1	-2.2	24.5	24.1	-0.4
Epirus-West Macedonia	27.1	26.8	-0.3	28.6	26.7	-1.8
Thessaly-Sterea Greece	26.3	25.8	-0.5	27.5	26.0	-1.5
Peloponnese. West Greece. Ionian islands	25.1	23.8	-1.3	23.5	23.8	0.3
Attica	24.8	22.3	-2.5	23.2	22.3	-0.9
Aegean islands	17.8	18.8	1.0	15.4	19.0	3.7
Crete	24.2	22.3	-1.9	24.8	22.3	-2.5

Source: Labour Force Surveys' monthly data. ELSTAT, KEPE calculations.

2. The data used to calculate these shares come from the quarterly *Labour Force Surveys* conducted by ELSTAT. During the writing of this article, data were available up to the first quarter of 2016.

first and second quarter should cause concern, since the unemployment rate increased by 3.7 pp, despite the expected strong effect of tourism. This might be caused by the small sample size, while part of that increase could be attributed to the drop in tourist arrivals due to the refugee flows towards major Greek islands, like Chios, Lesvos and Samos. In the rest of the decentralized administrations the unemployment rate dropped up to 2.5 pp (Crete), reaffirming positive developments already reported.

3.1.3. Developments in paid employment

Paid employment is the main type of employment in the Greek labour market, although it is less common compared to other European countries. The share of paid employees in Greece was 66% in 2015, when the respective share in the EU28 was approximately 85%.[3] Over time, paid employment in the country as a share of total employment remained almost constant, e.g. in 2015 the share was almost the same with that in 2008, despite continuous decreases in the number of paid employees due to the crisis, since those decreases went hand-in-hand with the general decrease in employment. Nevertheless, as shown next, the composition of paid employment has changed dramatically with respect to the type of jobs involved in hires.

Data from ERGANI reveal that following the decline in paid employment in May (-9,555 compared to May 2015), the number of paid employees increased in both June (by 33,608 persons) and July (by 19,281 persons).[4] Note that in 2016 there was a negative balance of paid employees only in January. Furthermore, during the period January-July 253,945 new paid employment jobs were created, which is an increase of more than 36% compared to 2015. During the same period in 2013 and 2014 new jobs more than doubled on a y-o-y basis. The evidence seems to indicate that paid employment has done quite well over the past three years, with the exception of a few months in 2015, which seem to have slowed its pace in 2016. Nevertheless, there are two issues that cause concern, as repeatedly noted in previous issues of the *Greek Economic Outlook*.

The first issue is the composition of new hires. As long as we want new jobs capable of supporting a dignified way of life, mainly through satisfactory wages, then full-time jobs are preferable.[5] This July, 46% of hires involved full-time jobs compared to 16% in July 2015, a figure which reflects the level of uncertainty one year ago. In the first seven months of the year full-time job hires accounted for 48% of total hires (1,256,383), compared to 46.1% in 2015.[6] Similarly, part-time job hires accounted for 37.7% (34.5% in 2015) and rotating job hires accounted for 14% (19.4% in 2015). The share of full-time job hires fluctuates during the first seven months by more than 10 pp (44.1% in February vs. 55.3% in April).

The second issue is the conversion of full-time work contracts to flexible forms of employment, such as part-time and rotating jobs: 3,924 full-time job contracts were converted in July 2016. Of these, 66.3% involved conversions to part-time jobs and 26.8% involved conversions to rotating jobs with the consent of the employee and the remaining 6.9% involved conversions to rotating jobs without the consent of the employee. In July 2015 the majority of full-time job conversions involved rotating jobs without the consent of the employee (80.6%), which reflected high uncertainty at that time. Things seem to be better in the first seven months of 2016, since 60.1% of full-time job contracts were converted to part-time jobs, while just 15.5% involved conversions to rotating jobs without the consent of the employee. The respective figures for 2015 were 29.6% and 55.6%.

With respect to the composition of paid employment flows, data seem to indicate a preference towards men, who are more often employed than women. In July, 82.3% of new jobs were taken by men. However, this imbalance does not seem to be the rule. For instance, in the first seven months of the year the respective share was 57.3% showing a clear narrowing of gender differences. It is interesting to note that women were more often hired only in April, while in March and May the scale was balanced. In July 2015, the negative balance of hires and dismissals was primarily fuelled by women (67%), due to the great hysteresis in hiring women, while during the first seven months of the same year 57% of new jobs were occupied by men,

3. The data come from the Eurostat database, they are annual and include individuals aged 15-64.

4. Recall that there was a decline in paid employment by 16,658 jobs in July 2015, as a result of capital controls and the general political and economic uncertainty of that time.

5. According to IKA data (http://www.ika.gr/gr/infopages/news/apasxolisi_01_2016.pdf) for January 2016, the mean wage for full-time employment in common firms (not building projects) is approximately 1,220 euros and for part-time jobs the mean wage is 400 euros.

6. Interestingly, with the exception of July, during the first seven months of 2015 the share of full-time job hires over total hires is bigger than that in 2016. This is probably an indication that the labour market exhibited a certain dynamism, which was interrupted by political and economic developments.

similar to 2016. However, in April and May women also occupied the majority of new jobs of paid employment, bearing a strong resemblance to 2016. This pattern is probably the result of the seasonal expansion of specific industries that often hire women.

Employers also seem to prefer youth over older individuals looking for a job. Approximately 22.5 thousand youth aged 15-24 occupied new jobs in July 2016. There are two interesting facts. The first one is that the other age groups had a negative balance, meaning that dismissals were more than hires, with the exception of age group 25-29 (2.6 thousand new jobs). The second fact is that even in July 2015, when uncertainty skyrocketed and paid employment shrank, the balance was positive for youth aged 15-24. During the first seven months of the year the dynamism of youth was confirmed, since individuals aged 15-24 got 34% (or 86.4 thousand) of the new paid employment jobs created, while in the respective period in 2015 they occupied 36.5% (or 66.4 thousand) of new jobs. The imbalance becomes obvious in Table 3.1.2, where the share of the unemployed by age group is calculated[7] for the first seven months of the year (January-July) and the new jobs each group occupied during the same period. Youth aged 15-24 represent 8.3% of the unemployed, but they occupy 34% of new jobs of paid employment. The imbalance is far less pronounced in age group 25-29, while it is reversed for the remaining age groups. In practice that means that –*ceteris paribus*– the younger someone is, the more likely he/she is to find a job.

A probable explanation is that youth are more flexible compared to older individuals looking for a job. For example, youth are often willing to work for lower pay, in part-time jobs or rotating jobs, etc., since they treat those jobs as a stepping stone in their professional development. Some institutional factors could also play a role, such as the lower minimum wage for youth up to 25 years of age or the plethora of subsidized employment programmes focused on youth. Moreover, cultural factors could provide some explanation, such as the strong role of the family, which allows youth even more flexibility.[8] On the other hand, better support to individuals over 45 years of age looks imperative, e.g. through active labour market programmes, in order for them to increase the share of new paid employment jobs they occupy.

TABLE 3.1.2 Shares of the unemployed and new paid employment jobs by age group, January-July 2016 (%)

Age	Unemployed	New paid employment jobs
15 - 24	8.3	34.0
25 - 29	13.1	15.3
30 - 44	40.5	28.5
45 - 64	36.6	22.0
64 +	1.4	0.2

Source: ERGANI and OAED, KEPE calculations.

The distribution of paid employment job posts across regions holds no surprises, but it is interesting. In June and July, for example, Attica was the only region that had a negative balance of hires and dismissals and approximately 7.7 thousand jobs were lost in June and 15.2 thousand jobs in July.[9] On the other hand, West Greece was the only region with a positive monthly balance of paid employment flows during the first seven months the year. Moreover, during the same time, most new jobs of paid employment were created in the South Aegean islands (32.1%), Crete (21.4%), the Ionian Islands (14.8%) and Central Macedonia (13.2%). Given the increase in tourist flows compared to the previous year, as shown by SETE data, the increase in paid employment was expected. In particular, arrivals at airports during the first seven months increased by 0.7% in the Dodecanese, 12.5% in the Cyclades, 11.8% in Crete, 11.3% in the Ionian islands and 5.8% in Thessaloniki. It is no accident that, from April until June, waiters and bartenders were in very high demand, while industries such as Accommodation and food service activities created more jobs than any other sector from January until July. However, tourism is just one of the economic activities expected to create new jobs of paid employment and its impact varies according to its presence in each region.

7. The data come from the summary reports for the unemployed and the subsidised unemployed, published by OAED and available on the internet, which involve those unemployed actively looking for a job.

8. Family support could operate in the opposite direction in some cases, for example, when job offers are rejected as unsatisfactory due to mismatch or lower than expected pay or long distance from the place of residence. Thus, the effect is cannot be *a priori* identified.

9. According to data by SETE (http://sete.gr/el/statistika-vivliothiki/statistika/) arrivals at Eleftherios Venizelos increased in the first seven months of the year by 5.6%. It is fair to assume that at least some visitors are headed to the capital. Note that on a y-o-y basis the increase in July was 10%. However, paid employment decreased.

To sum up, paid employment increased for another consecutive month and 253,945 new jobs were created in the first seven months of this year, a performance distinctively better than the previous year. New jobs were created mainly in industries related to tourism. This is reflected in the industries, professions and regions that rank at the top of the respective list. These new jobs were primarily occupied by men and younger individuals, while only half involve full-time employment. However, the process of converting full-time job contracts to part-time and rotating job contracts seems to have slowed down. Therefore, the picture drawn for paid employment seems improved in the first seven months of 2016, without justifying any complacency though.

3.1.4. Conclusions

Employment continues to increase and, thus, unemployment decreases in the first half of 2016. Men and youth seem to have more chances of getting a job compared to women and older individuals also looking for a job. Paid employment shows clear signs of recovery, which are verified by the marginal increase in full-time job hires and the mitigation of the phenomenon that involves converting full-time job contracts to flexible types of employment contracts. Moreover, tourism and professions related to it seem to create most of the new jobs.

As far as age is concerned, caution should be exercised and more attention should be paid to those looking for a job who are over 45 years of age. They possess work experience that might depreciate rather quickly. Therefore, active labour market programmes could focus on them more. On the other hand, the performance of women in getting a job, especially in light of the numerous active labour market programmes that focus on them, cause serious concerns that should at least lead to assessing the efficiency of those interventions, in order to adopt corrective measures. Lastly, as long as flexible types of employment are not suitable for securing a dignified way of life, since they often entail low pay, efforts to create new and sustainable full-time jobs, that do not necessarily fall within the boundaries of the labour market, could strengthen demand for goods and services and allow the Greek economy to overcome the crisis.

4. Development policies and sectors

4.1. Transport services balance: Analysis by mode of transport

Theodore Tsekeris

This article investigates the decisive but declining importance of transport services on the evolution of the total export services (receipts), import services (payments) and services balance in Greece. The role of transport services is particularly examined in relation to the mode of transport of passengers and goods.[1] The present analysis is based on the collection and processing of transport receipts and payments time series originating from the Bank of Greece. The dataset spans a long time period, from January 2002 to March 2016. In this way, it is possible to identify structural changes in the amount of transport receipts and payments, in total and by mode of transport, in the presence of the economic crisis.

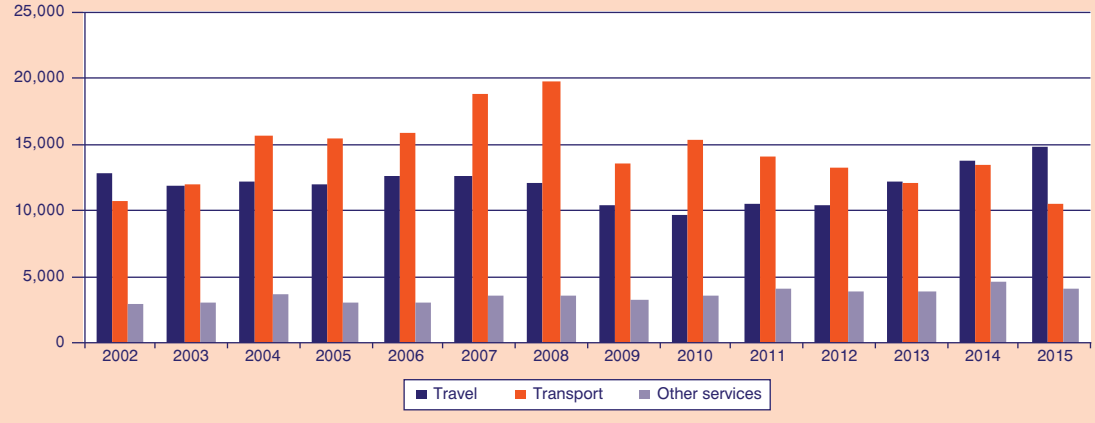
Figures 4.1.1 and 4.1.2 depict the evolution of receipts and payments related to travel, transport, and other services. Correspondingly, Figures 4.1.3 and 4.1.4 illustrate the evolution of the share of each type of service in the total amount of receipts and payments.

The figures indicate that, during the period of the crisis (from 2008 onwards), both the transport receipts and transport payments were reduced by almost -47%. Specifically, transport receipts dropped from 19.8 billion euro in 2008 to 10.5 billion euro in 2015, while transport payments dropped from 10.7 billion euro in 2008 to 5.7 billion euro in 2015 (Figure 4.1.1).

To the contrary, in the same period (2008-2015), travel receipts significantly increased by 23%, particularly due to their gradual growth during the years 2013-2015. More specifically, in 2013, for the first time after 2002, the level of travel receipts exceeded (by 91 million euro) the level of transport receipts. This difference in favor of travel receipts reached 269 million euro in 2014 and 4.37 billion euro in 2015, mirroring the significant growth of tourist arrivals in Greece as well as the overall reduction of economic activities related to transport services abroad.

The declining contribution of transport to the services balance in Greece during the crisis is further clarified by examining the reduced shares of transport receipts and payments, with respect to the total amount of receipts and payments (Figures 4.1.3 and 4.1.4, respectively). Specifically, regarding the receipts, during 2008-2015, the transport share decreased by -36.3%, namely, from 56% in 2008 to 35.7% in 2015. In contrast, in the same

FIGURE 4.1.1
Evolution of the amount of receipts by type of service (in million euro and constant values of year 2010)



1. These data also include the transformation of CIF prices, that is, the transport cost of importing goods, which is subtracted from the value of imported goods and is attributed to transport services.

FIGURE 4.1.2
Evolution of the amount of payments by type of service (in million euro and constant values of year 2010)

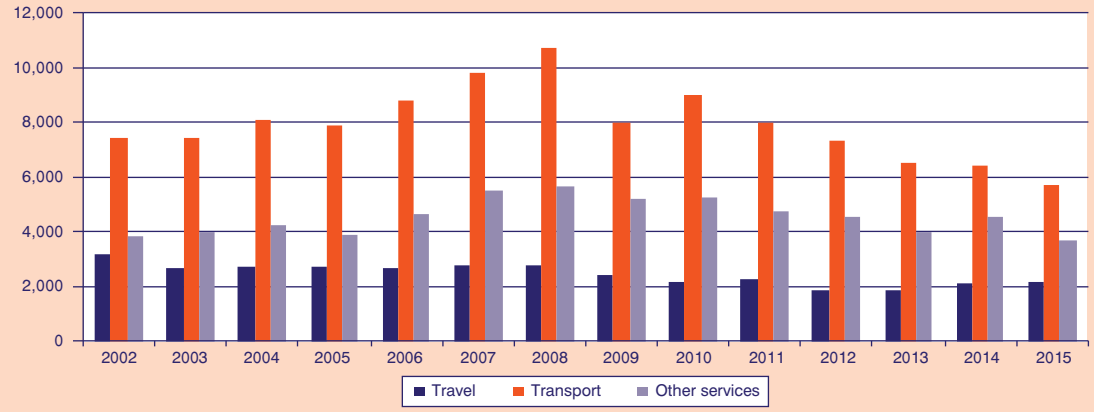


FIGURE 4.1.3
Evolution of the share of receipts by type of service

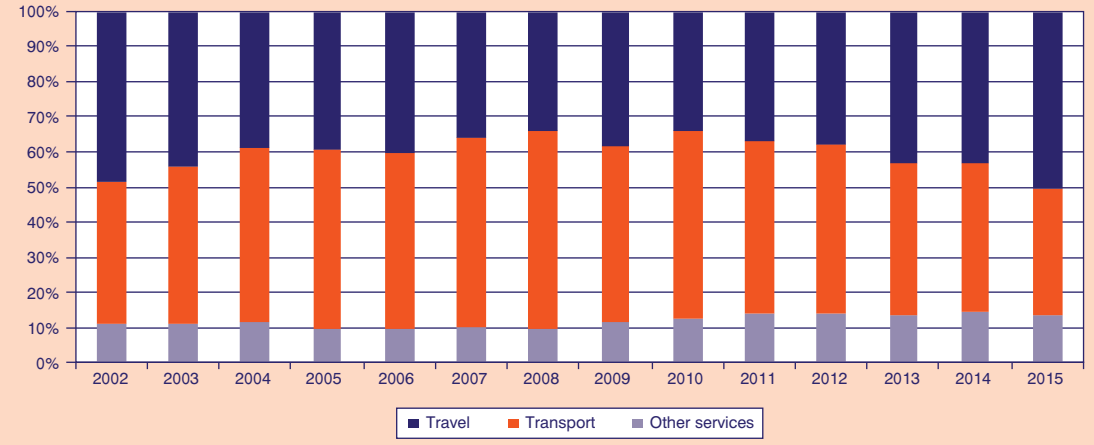
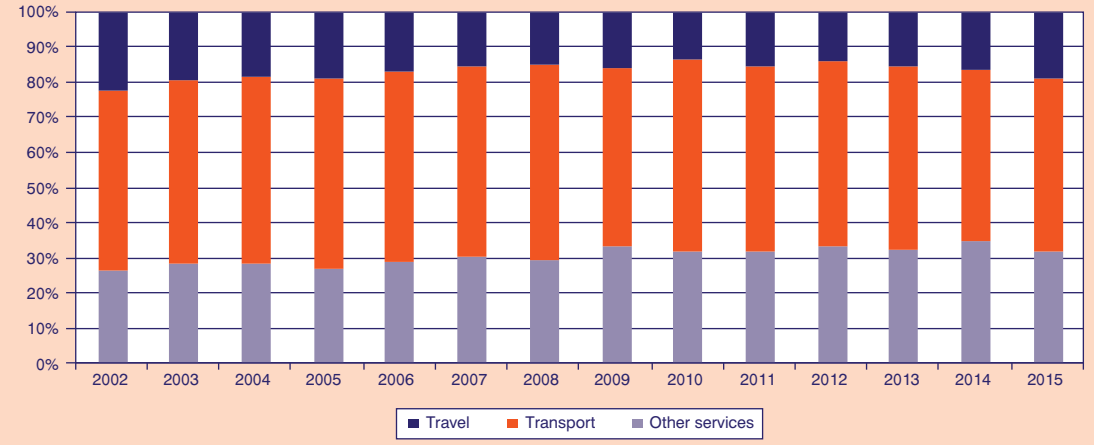


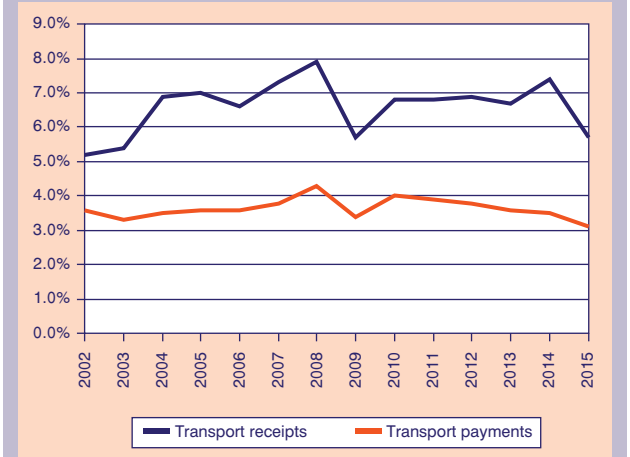
FIGURE 4.1.4
Evolution of the share of payments by type of service



period, the travel share increased by 48.4%, namely, from 34.1% in 2008 to 50.6% in 2015. The reduction of the transport payment share was smaller, by -11.9%, namely, from 56.1% in 2008 to 49.4% in 2015.

Regarding the evolution of the transport receipts and transport payments as a proportion of the real Gross Domestic Product (GDP), a significant decrease in the values of both variables is also observed (Figure 4.1.5). Specifically in relation to the transport receipts as a proportion of the GDP, while it rose from 5.2% in 2002 to 7.9% in 2008, it declined to 5.7% in 2009 and, despite its increase up to 2014 when it reached 7.4%, in 2015 it fell again to 5.7%. As far as the transport payments as proportion of the GDP is concerned, while it rose from 3.6% in 2002 to 4.3% in 2008, it declined to 3.1% in 2015, which is the lowest proportion marked in the study period.

FIGURE 4.1.5
Receipts and payments of transport services as a proportion (%) of the real GDP



Next, the evolution of transport receipts and transport payments is presented in more detail with regard to particular mode of transport. The modes of transport refer to maritime transport, air transport, road transport, rail transport, transport via pipelines, transport by post and courier, and the remaining means of transport, which include space transport, inland waterway transport, electric energy transport (transmission), and other support and miscellaneous transport services.

Figure 4.1.6 illustrates the crucial role of maritime transport in the total amount of receipts from transport services. Specifically, during the period 2002-2011, the mean annual share (%) of receipts from maritime transport in the total amount of transport receipts was greater than 90%. However, the specific share of maritime transport gradually declined from 89% in 2012 to 79% in 2015. On a quarterly basis, it marked its lowest value in the third quarter of 2015, i.e., 67%.

As far as the shares of transport receipts by other (non-maritime) means of transport are concerned, air transport services present the largest receipts during the whole study period (Figure 4.1.7). More specifically, the air transport receipts reached their highest value in 2015, that is 1.4 billion euro, which corresponds to 75% of the total receipts from transport services by other (non-maritime) means of transport. The transport receipts from services by the remaining transport modes and by road transport follow in order, with shares equal to 12.8% and 10.6%, respectively, in 2015, compared to their respective shares of 14.9% and 12.5% in 2009. In 2015, very low shares are observed for the corresponding receipts from services by post and courier (1.6% against 8.7% in 2002), by rail transport (0.3% against 1.9% in 2011) and by transport via pipelines (0.1% against 1% in 2009).

FIGURE 4.1.6
Shares of transport receipts by maritime transport and by other means in total

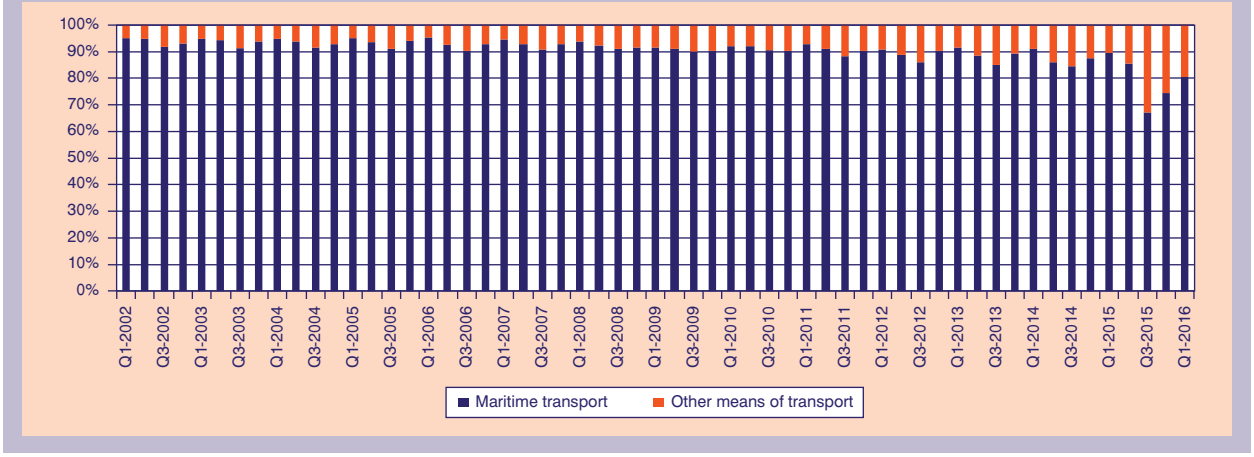


FIGURE 4.1.7
Shares of receipts (with respect to the total transport receipts) from transport services by other (non-maritime) means of transport

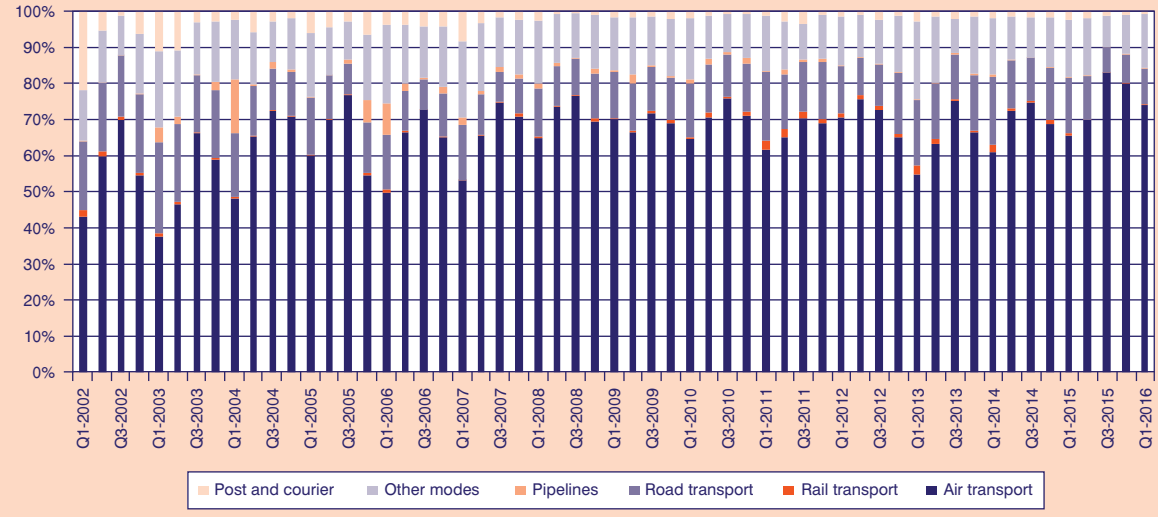
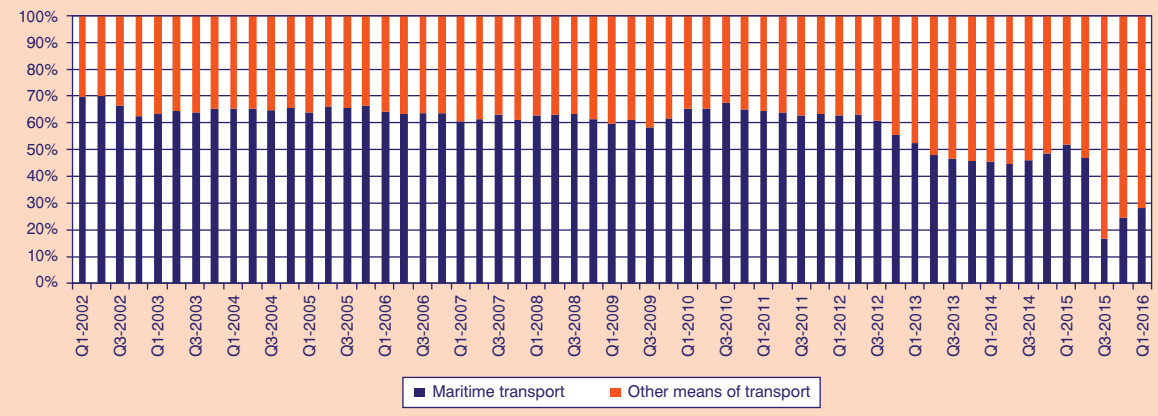


FIGURE 4.1.8
Shares of payments for transport services by sea and other means in total



Regarding the payments for transport services, maritime transport also plays the most important role, compared to the other means of transport. Nonetheless, the level of payments for services by maritime transport has remarkably decreased during the last years. Specifically, the share of payments for maritime transport services to the total amount of transport service payments dropped from 63% in 2008 to 35% in 2015 (Figure 4.1.8). It is noted that, in 2015, the payments for maritime transport services were 2.1 billion euro, compared to 6.5 billion euro in 2008.

In the same year (2015), the payments for transport services by the remaining modes of transport (such as electric energy transport) amounted to 1.9 billion euro, compared to almost 3 billion euro in 2008, while the corresponding payments for air transport services amounted to 1.2 billion euro, compared to almost 0.6 billion euro in 2008. Figure 4.1.9 depicts the notable increase of the share of air transport service payments to the total payments for non-maritime transport services, and the decrease in the corresponding share of transport service payments by the remaining modes. The corresponding service payment shares for road transport, transport by post and courier, and rail transport are very low in 2015 (4.1%, 0.6% and 0.3%, respectively).

Finally, Figure 4.1.10 summarizes the evolution of the transport service balance (receipts payments) in total and by maritime transport, land (road and rail) transport, air transport, transport via pipelines and the re-

FIGURE 4.1.9
Shares of payments (with respect to the total transport payments) for transport services by other (non-maritime) means of transport

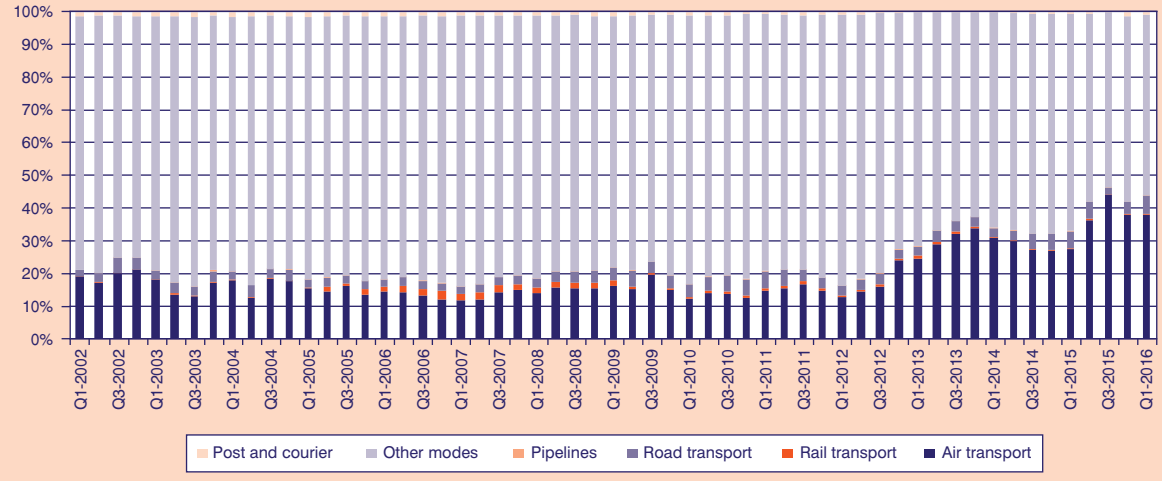
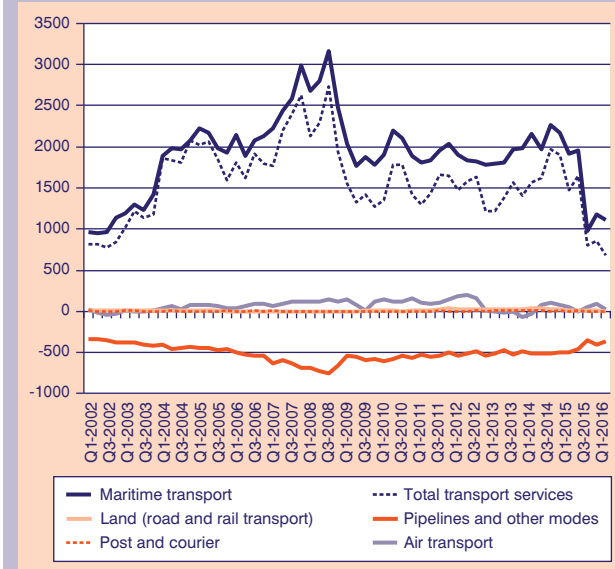


FIGURE 4.1.10
Balance of transport services in total, by sea, by air, by land, by pipelines and other modes, and by post and courier



Note: All time series have been seasonally adjusted using the TRAMO/SEATS filter.

maining modes of transport (such as electric energy transport), and by post and courier. This analysis underlines the intertemporal significant positive role of Greek mercantile shipping and the Greek-owned fleet in the balance of services, although the important decrease in the maritime transport service balance during the years of economic crisis and, particularly, in 2015 (from 11.1 billion euro in 2008 to 6 billion euro in 2015). It is further noted that the service balance is positive for air transport (188 million euro in 2015 from 500 million euro in 2008), road transport (48 million euro in 2015 from 45 million euro in 2008) and the postal and courier services (6.5 million euro in 2015 from -25 million euro in 2008).

4.2. The Greek banking system and its role for resetting the Greek economy: Preconditions for the complete lifting of capital controls

Nikolaos I. Georgikopoulos

4.2.1. Introduction

Undoubtedly, 2016 is a key year for resetting the Greek economy into a growth pattern whereby the Greek banking system should have a leading role, so that Greece can exit the recession as soon as possible and at the same time achieve sustainable economic growth in the coming years. The recovery of the Greek economy and the achievement of sustainable economic growth require a healthy, functional and viable banking system. Nowhere in the world could sustainable growth be observed if the financial system did not function properly, its key role being the provision of liquidity from those who have surpluses (depositors and investors) to the real economy that displays a lack of funds (businesses and households) through the channel of credit growth. On the other hand, it is really difficult to draw an effective economic strategy in order to achieve a rapid growth in the Greek economy through funding from credit institutions, given the existing restrictions on capital movements (capital controls) in Greece. Had these restrictions not been imposed in June 2015, and given the rate of deposit "flight" from Greek banks, then the collapse of the financial system and an almost certain participation of Greek depositors (bail-in) in the recent process of bank recapitalization would have occurred.

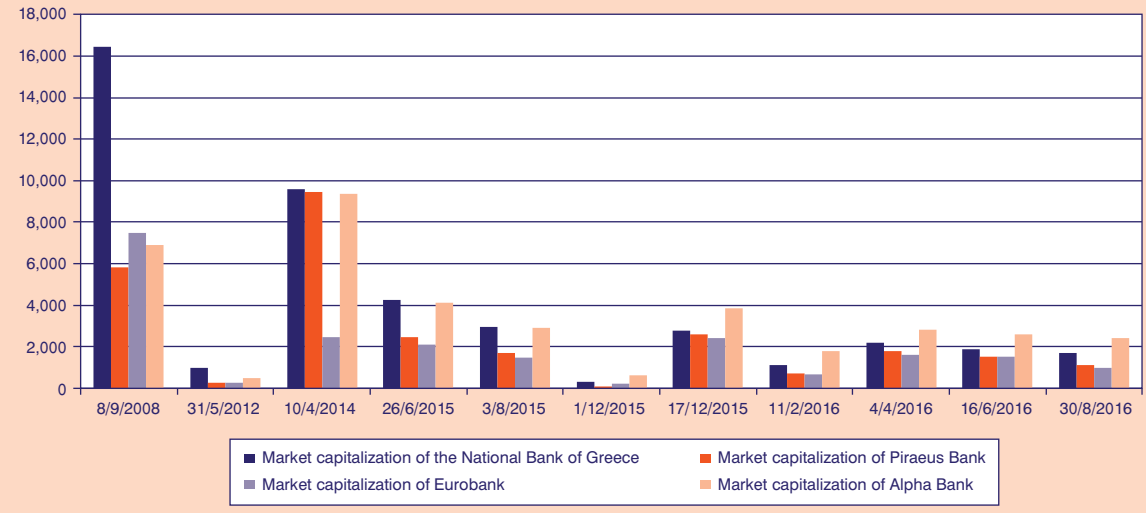
Therefore, the issues addressed in this article are: a) whether it is possible for the financial system, given its current state, to contribute substantially to the recovery of the Greek economy and b) what are the necessary preconditions, so that Greek banks can play a pivotal and intermediating role in achieving this objective.

In order to objectively address the aforementioned issues, a quick overview within the Greek banking stock market, as well as its latest developments will be presented. In addition, the most significant areas of risk and prudential surveillance of the domestic banking system –namely, liquidity, credit risk and capital adequacy– will be examined. This is because, prudent and rational management in these areas is considered to be the "threefold success", so that Greek banks can regain their pace and adequately finance the real economy in order for Greece to permanently exit the recessionary cycle, which it entered again after the imposition of capital controls.

4.2.2. Evolution of the market capitalization of Greek banks

When the signs of the international financial crisis were felt on the European continent by the end of 2008, the operation of Greek banks was not particularly affected. Nevertheless, when the crisis was transformed into a debt crisis (sovereign and private) by the beginning of 2010, the intermediating role of banks was hampered, resulting in negative profitability and insufficient provision of finance to the real economy. The reasons for the negative profitability and liquidity crunch which Greek banks are facing (with spillover effects to Greek enterprises and households) are manifold, yet directly related to the debt crisis and the fiscal austerity measures that were imposed on the Greek economy –as prior to the crisis the Greek banking system was relatively sound and adequately capitalized. Nevertheless, it should be noted that it was vulnerable to a deterioration of an extended debt crisis, as proven later, due to its exposure to government bonds, but also to funding of state institutions and non-tradable sectors. The limited ability of financial institutions to provide liquidity to the real economy is exacerbated by the procyclicality impact, whereby in cases of a recession, their capital base is used as a safety margin to deal with unexpected risks (i.e. in the current period due to the size of non-performing assets in the loan portfolio as well as the delay in providing a rational response). As a result, even a higher than required minimum capital adequacy in such cases does not allow them to take higher investment positions, or extend financing to the economy. On the other hand, the market capitalization of Greek banks has been significantly affected in the last few years, mainly due to the negative course of the Greek economy and the Greek banking system. More specifically, this effect was due to the prolonged review process of the Greek economic program, the lack of a stable political climate, as well as the injured confidence of investors/shareholders regarding the achievement of their financial objectives (within the time constraints) that have been incorporated in the business plans of Greek banks, as well as from the delay in managing large volumes of non-performing loans in the loan portfolio of banks. It should also be noted that the uncertainty observed in international financial markets with regard to the course of the European economy,

DIAGRAM 4.2.1
Market capitalization of the four Greek systemic banks (by bank - in million €)



Source: Athens Exchange Group and author's own calculations.

and in particular its banking system, has also played a role since the beginning of the year.

In order to provide evidence for the aforementioned developments, we should examine the market capitalization for the Greek systemic banks. At the beginning of the financial crisis, the Greek systemic banks (Piraeus Bank, National Bank of Greece, Alpha Bank and Eurobank) had a market capitalization value of €36.6 billion on September 8, 2008 (Diagram 4.2.1).

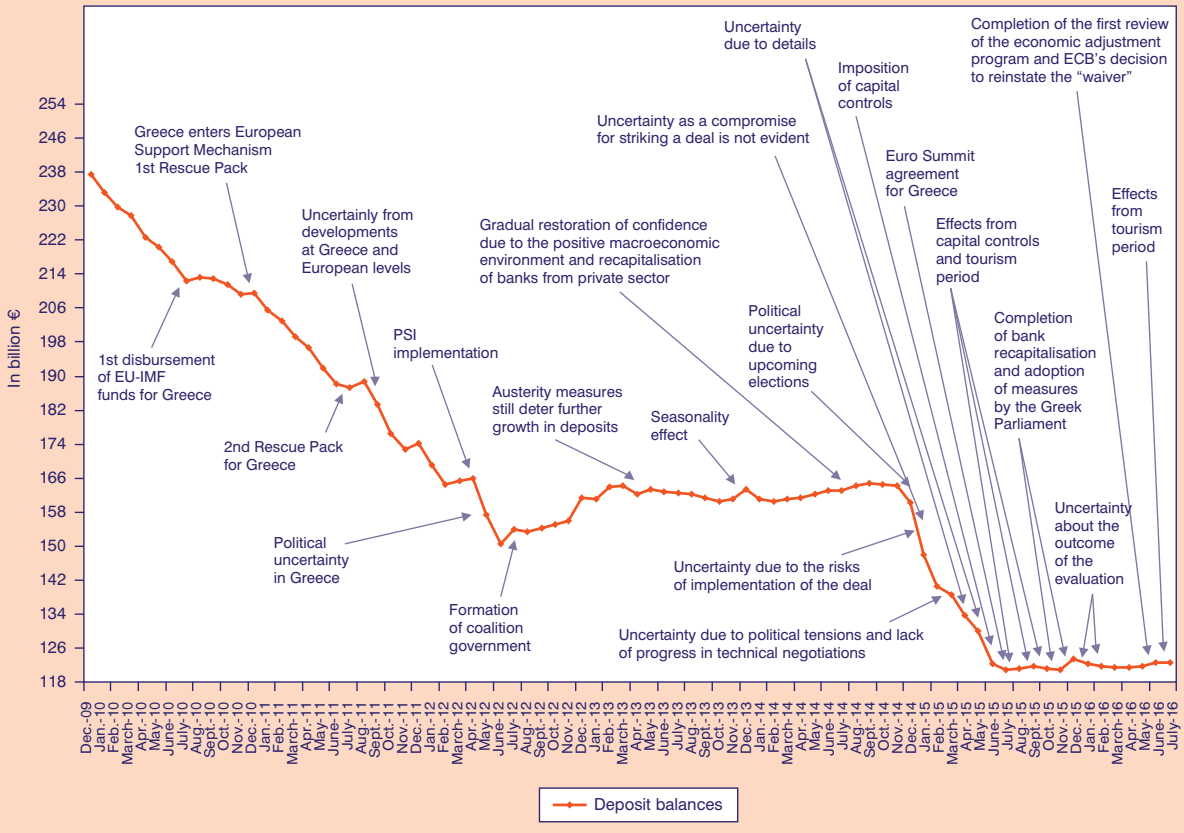
Nevertheless, since the end of 2009, where Greece was excluded from access to international capital markets, market capitalization demonstrated a declining trend reaching the lowest level of €1.7 billion on June 5, 2012, because of the political uncertainty about a potential Grexit in view of the critical election period. Thereafter, in 2013 the largest restructuring of the Greek banking system took place, while in 2014 the market capitalization value of banks increased significantly, due to the successful recapitalization of banks and the improved economic conditions, reaching its highest level of €37.9 billion on June 10, 2014. However, during the first half of 2015 the political uncertainty for reaching an agreement between Greece and international lenders led to a significant decrease in the market capitalization value of Greek systemic banks, while the imposition of capital restrictions on capital movements on June 28, 2015 resulted in the closure of the stock market for one month. With the reopening of the exchange, the Greek banks lost much of their market capitalization value, while after the announcement of the stress test results by the ECB on October 30, 2015, the banks' market capitalization has been substantially and consistently reduced, given the market need to adapt the banks' stock price to the new lower levels in order to attract international investors. By the beginning of December 2015, the systemic banks had a market capitalization value of just €1.2 billion: the National Bank of Greece amounting to €286 million, Alpha Bank amounting to €600 million, Piraeus Bank to €61 million and Eurobank to €206 million. After the completion of the recapitalization of Greek banks and their incorporation into the banking indices, the new market capitalization of systemic banks amounted to €11.6 billion on December 17, 2015. Because of the increased uncertainty regarding the process of the assessment of the economic program which is being implemented in the Greek economy and its completion date, as further clarification was required regarding the pension reforms and further budgetary measures, the market capitalization of Greek banks decreased substantially, and amounted to €4.2 billion (February 11, 2016). Thereafter, banking stocks rebounded significantly and amounted to €8.4 billion (April 4, 2016). Finally, between April and August 2016 the market capitalization of the four systemic banks declined due to the slim prospects for Greek economic growth as well as the deterioration of the conditions that were observed in the European banking sector. More specifically, by the end of August 2016, Alpha Bank was valued at €2.4 billion, National Bank of Greece at €1.7 billion, Piraeus Bank at €1.1 billion and Eurobank at €997 million.

4.2.3. Evolution of deposits in the Greek banking system

The banking system has, however, been significantly hampered following the large outflow of deposits from corporations and households since the beginning of 2010. More specifically, concerning the liquidity of the Greek banking system, there have been two periods observed whereby the loss of confidence from depositors regarding the course of the Greek economy and the prospects of Greece remaining in the Eurozone led to a significant outflow of deposits. The first period, as a result of the uncertainty of the financial crisis and the debt crisis, led to a decrease in deposits from €238 billion at the end of 2009 to €151 billion at the end of June 2012 (Diagrams 4.2.2 & 4.2.3), through capital outflows mainly to foreign financial institutions. The second period was related to the uncertainty about the outcome of negotiations aimed at a new agreement on a financial program for Greece, after the election of the new government on January 25, 2015. Since there was no sign of a compromise between Greece and international lenders, this development led to the reduction of deposits from €148 billion (March 31, 2015) to €130 billion (May 31, 2015). The reduction in deposits in this case is attributed to the outflow of deposits from the domestic banking system to destinations mainly within the Greek territory (i.e. safety deposit boxes, dwellings, etc). It should be noted that deposits are directly linked to GDP and the financial situation of the Greek economy. For many households and SMEs, which were affected by the austerity measures, disposable income dropped significantly, contributing to an additional reduction of deposits due to the need to cover direct expenses and cope with increased taxation.

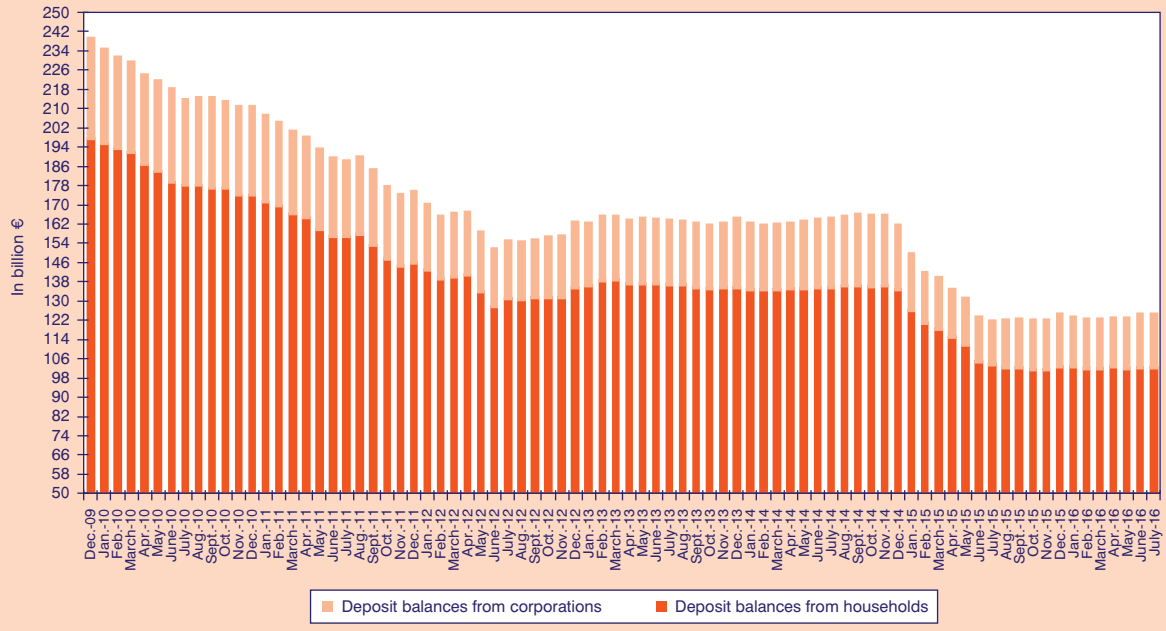
It should be noted that in July 2016, private sector deposits amounted to €122.6 billion (households: €102 bn; corporations: €20.6 bn) compared with €122.7 billion in June 2016 (households: €101.8 bn; corporations: €20.9 bn), while in July 2015 they amounted to €120.8 billion (households: €102.9 bn; corporations: €17.9 bn). Furthermore, it is lately observed (Diagram 4.2.3) that despite the imposition of capital controls, household deposits have slightly decreased. This is explained by the increased tax and debt obligations, in relation to household income, while regarding corpo-

DIAGRAM 4.2.2
Evolution of total deposits over time in the Greek banking system (in billion €)



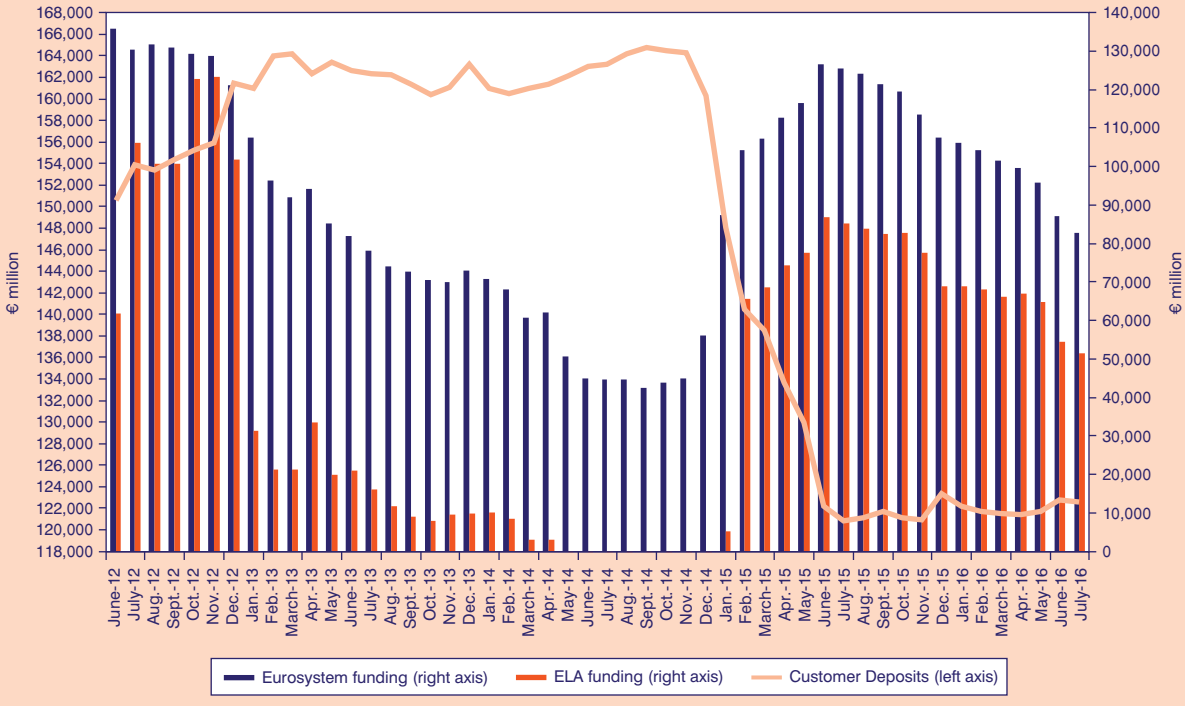
Source: Bank of Greece, published financial statements of Greek banks and author's own calculations.

DIAGRAM 4.2.3
Evolution of deposits from corporations and households over time in the Greek banking system (in billion €)



Source: Bank of Greece, published financial statements of Greek banks and author's own calculations.

DIAGRAM 4.2.4
Eurosystem funding vs funding from the Emergency Liquidity Assistance - ELA (in million €)



Source: Bank of Greece, published financial statements of Greek banks and author's own calculations.

rations, there is an increase in deposit balances due to the expanded use of electronic transactions.

In addition, the limited capacity of Greek banks to provide liquidity to the real economy has further deteriorated from the decision of the ECB Governing Council on February 4, 2015, whereby the waiver of minimum credit rating requirements for marketable instruments issued or guaranteed by the Hellenic Republic was lifted. This decision had immediate consequences for the provision of cheaper liquidity from the ECB via the Pillar 2 & 3 system of guarantees. As a result, Greek banks had to replace, after the lifting of the waiver, a large part of their funding stemming directly from the ECB at an interest rate of 0.05%, with more expensive ELA funding at an interest rate of 1.55%. Nevertheless, the ECB's Governing Council decided on June 22, 2016 to reinstate the previous status of the waiver for the eligibility of Greek bonds and reaccept the marketable instruments issued or guaranteed by the Hellenic Republic as collateral for the main refinancing operations of Greek banks.

It should be noted that, in July 2016, the total Eurosystem funding (ECB and ELA) amounted to €82.8 billion, of which ELA amounted to €51.4 billion, compared to €125.5 billion of total funding in July 2015 (after the imposition of capital controls), of which €85.3 billion were drawn through ELA (Diagram 4.2.4).

4.2.4. Evolution of non-performing exposures in the loan portfolio of Greek banks

The strict austerity measures that have been imposed on the Greek economy since the inauguration of the first memorandum ("Mnemonion"), have led to the decline in disposable income of both households and corporations. The structure of income changed since the funding base for both households and non-financial corporations became more unstable and volatile. In addition, unemployment remains at high levels, in spite of the fact that in June 2016 there was a reduction to 23.4%, from 24.9% in June 2015. Nevertheless, the percentage of the workforce in part-time and temporary activities increased significantly compared to the period before the financial crisis. Both the decrease of disposable income and the uncertainty of its preservation in the near future have increased the repayment burden of debt by both households and non-financial corporations. Additionally, due to the unfavorable macroeconomic environment, the demand for funding of corporations has been limited, even for "viable" corporations, also due to increased business risk. At the same time, households have drastically reduced their consumer expenditure due to the uncertainty of their financial potential. The imposition of capital controls in June 2015 has hampered economic activity in the domestic economy to a further extent. Of course, the implication was lower than expected, due to the positive contribution of net exports, the increase in tourist arrivals and the lower-than-expected decline in consumer expenditure, but adverse effects have been registered in sub-sectors such as sales and imports. As a result of the aforementioned developments, the asset quality of Greek credit institutions continued to deteriorate from the beginning of the financial crisis to the present. Based on the latest available data, the ratio of non-performing exposures increased in all sectors during 2015 and in the first quarter of 2016, with the relevant indicator amounting to 45.1% in Q1 2016, compared to 44.2% at the end of 2015 and 39.9% at the end of 2014. In absolute terms, the total amount of non-performing exposures reached €108.6 billion in Q1 2016 from €108 billion in 2015 and €99 billion in Q4 2014.

Regarding non-performing loans (NPLs), there is a similar trend as NPEs, with the relevant indicator amounting to 37.2% in Q1 2016, compared to 36.8% at the end of 2015 and 33.8% at the end of 2014. In absolute terms, the total amount of non-performing loans reached €78 billion in Q1 2016 from €78.2 billion in 2015 and €77.5 billion in Q4 2014.

During the same period, the coverage of non-performing exposures by provisions amounted to 49.8% in Q1 2016 from 50.1% in Q4 2015 and this small decrease implies some relative improvement of credit risk in the portfolio of Greek banks. Nevertheless, the ratio recorded in Q1 2016 is significantly higher compared to the corresponding ratio of 44.0% in Q4 2014. It is noted that the European median ratio for this indicator amounts to about 41%.

4.2.5. Evolution of capital adequacy ratios of Greek banks

Undoubtedly, after the implementation of the PSI,[1] banks recorded significant additional losses, due to their possession of a significant amount of government bonds that deprived them of an important amount of their capital. This capital was replenished both with state

1. The Private Sector Involvement (PSI) that was completed on March 9, 2012 involved the acceptance by Greek government bondholders of a voluntary "haircut" on the face value of the debt they had in their possession as well as a loss from the yield.

TABLE 4.2.1 Capital adequacy indicators (%)

	Greek commercial banks				
		Greece			EU domestic banks
On a consolidated basis	2014	2015 H1	2015	2016 Q1	2015 Q3
C.A.R.	14.1	10.3	16.5	16.2	16.9
Tier I ratio	13.9	10.1	16.4	16.1	14.2
Common Equity Tier I ratio	13.8	10.1	16.4	16.1	13.1
		Greece			EU domestic banks
On a solo basis	2014	2015 H1	2015	2016 Q1	2015 Q3
C.A.R.	16.5	12.3	18.7	18.5	-
Tier I ratio	16.1	12.1	18.6	18.4	-
Common Equity Tier I ratio	15.9	11.9	18.6	18.4	-

Source: Bank of Greece and published Financial Statements of Greek banks.

aid through the Hellenic Financial Stability Fund (HFSF) in 2012 and 2013 and with the help of the private sector in 2013 and 2014, thus achieving a full restoration of capital adequacy ratios in the Greek banking system. It should also be noted that in 2012-2014 one of the largest restructurings in the Greek banking system was implemented, and it led to a significant increase in its concentration, thus creating four major banking groups, namely the aforementioned systemic banks.

The last recapitalization of the four Greek systemic banks was completed by December 2015 with €5.3 billion from private investors, €2.7 billion from Liability Management Exercises (LME) and €5.4 billion from the HFSF. This recapitalization was made mainly in response to the reduction in regulatory capital due to the rapid increase of non-performing loans. As a result, the general capital adequacy ratio (CAR) of Greek systemic banks (on a solo basis) is estimated currently on average at about 18.5%, while the Common Equity Tier 1 ratio is at 18.4% and they are both considered to be among the highest in the European Banking System (Table 4.2.1).

4.2.6. Conclusions

In the previous sections of this article, the current state of the Greek banking system was examined with respect to its capital adequacy, liquidity, and credit risk. Hence, it became clear that the lack of (low cost) liquidity as well as increased credit risks that are inherent in the loan portfolio due to the large stock of NPEs, are the main factors that do not allow the financial system to "function" and to sufficiently finance the needs of the real economy. Instead, the capital adequacy of the banking system remains at high levels, and there are no signs of an imminent requirement for a new recapitalization.

Undoubtedly, the "adverse albeit necessary" restrictions on capital movements significantly hamper the real economy. Additionally, to the extent that capital controls are maintained and the economy remains in recession, the lack of liquidity that mainly affects SMEs in Greece will continue to exist. At the same time, it will adversely affect the confidence of depositors and investors in the Greek banking system and the growth prospects of the Greek economy. Consequently, capital controls should be fully lifted as soon as possible. But in order to achieve this objective and to allow the Greek economy to permanently exit the state of capital controls, the following prerequisites must be met:

1. The reviews of the Greek financial adjustment program must be successful without causing further delays in the forthcoming period. It is also necessary to implement all of the remaining structural reforms outlined in the current Memorandum ("Mnemonion"), as well as the growth-oriented policies that aim to provide an exit from the recession of the Greek economy and the completion of the fiscal adjustment.
2. Debt should be restructured, even in the short term at a first stage, after the completion of the current

review (October 2016), in order to become truly sustainable with the "certification" of a sustainability report by the IMF and its approval by the ECB. This would automatically mean the integration of Greek bonds in the quantitative easing program (QE) of the ECB.

3. The confidence of the citizens of Greece, the political and the economic system should be immediately restored. To the extent that social and economic uncertainty persists and Greek citizens do not trust the proposed economic strategy, any attempt to revitalize the Greek economy will not yield any meaningful outcome.

4. The restoration of Greek depositors' confidence in the domestic banking system is deemed as necessary. This should be reflected in the return (increase) of deposits. There may not be a complete lifting of capital controls if approximately 2/3 of deposits do not reenter the system. This amount has been withdrawn from the banking system since December 2014 and shortly before the imposition of restrictions (around €20 billion). Only in this way, will banks be enabled to drastically reduce the ELA and substitute its larger amount with direct borrowing from the ECB.

5. For as long as Greece remains in the fiscal consolidation program, the existing European Directive on deposit guarantees up to €100.000 should be applied to the letter and without any exceptions, contributing in this way to the development of confidence in the banking system.

6. Banks should focus on the major issue of non-performing loans in order to achieve the targets set by the Bank of Greece that would lead to their immediate reduction in the forthcoming period. In addition, banks should proceed to a wide-range restructuring of non-performing mortgage loans and NPLs of SME loans through a reduction in interest rates, an increase in the grace period and an extension of the repayment term. On special occasions and if all of the aforementioned measures do not yield the desired outcome, then banks could apply a «haircut» to a portion of the principal amount of these problem loans, rendering them as performing. At the same time, banks should be "permitted" to undertake real estate auctions as well as auctions of businesses on a limited scale, in cases where there is significant evidence that their owners/holders are "strategic defaulters".[2] This measure will act as a means of pressure in the latter case and it will withhold the upward trend of the delinquencies, while concurrently freeing up funds that can be diverted to the real economy.

The aforementioned six actions are the necessary preconditions for the release of the Greek economy from capital controls. However, given the fact that the full adoption and implementation requires a considerable amount of time, at least the first half of 2017 must go by.

2. Borrowers that have the capacity to service their loans, either from their total deposits and/or from the amount of their monthly income, but nevertheless fail to do so or misuse the protective framework of the existing law.

4.3. Analysis of tourism trends in Greece

Nikos Vagionis

4.3.1. Analysis of the tourist turnover

It has been noted in previous analyses that economic activity in tourism is important for Greece. It has proved resilient to the crisis, and retains a positive performance in a period of difficult economic times in our country.

We examine next the Turnover Index in Accommodation and Food. Analysing yearly and quarterly data, and also with the help of Figures 4.3.1 and 4.3.2, it can be observed that:

As shown in Table 4.3.1, using the new base of 100 for 2010, the average annual index recorded its historically highest revenues in the tourism sector in 2008, reaching **119.8**. Since then, a phase of reduction of the turnover began and the average annual index fell to **108.9** in 2009, a trend that continued in 2010 with the annual rate falling to **100,** in 2011 with the value of the index reaching **92.6**, and in 2012 at **76.7**, recording the lowest average annual price of the Turnover Index of Accommodation, which has decreased overall by 36% since 2008.

The downward trend continued until the first quarter of 2013. From the second quarter of 2013 (See Figure 4.3.2 and Table 4.3.1) a continuous increase in the index has taken place, which is reflected by the percentage change of +4.5% of the average annual index from 2012 to 2013, when the index stood at **80.3**, while all the individual variations of the respective quarters increased. This trend continued in 2014, with the annual index at **89.8**, registering growth of +11.8% over 2013, and resting at the level of **92.6** for 2015, which compared to 2014 marks a growth of +3.1%. All the individual quarters of this period up to the third quarter of 2015 marked an increase.

At the fourth quarter of 2015 a decline of -9.1% compared to the same quarter of 2014 was recorded, with the index at 58.3, which continued in the first quarter of 2016 with the index at **42.5**, decreased by -11.7%. In the second quarter of 2016 the index stood at **96.6**, decreased by 1.1% compared to the same period of 2015. Of course, this came after a very low first quarter, which leaves some place for optimism for the total figures of 2016. However, the fact has been, and remains, that while the revenues, as recorded by the index, have made some recovery, they still remain below those of 2010, and well below those of 2008, despite a significant increase in arrivals.

One can also mark that the 'off peak' Q4 and Q1 of each year showed the greatest changes in the period considered (see Figures 4.3.1 and 4.3.2 and Table 4.3.1), which highlights the high seasonality of the tourism

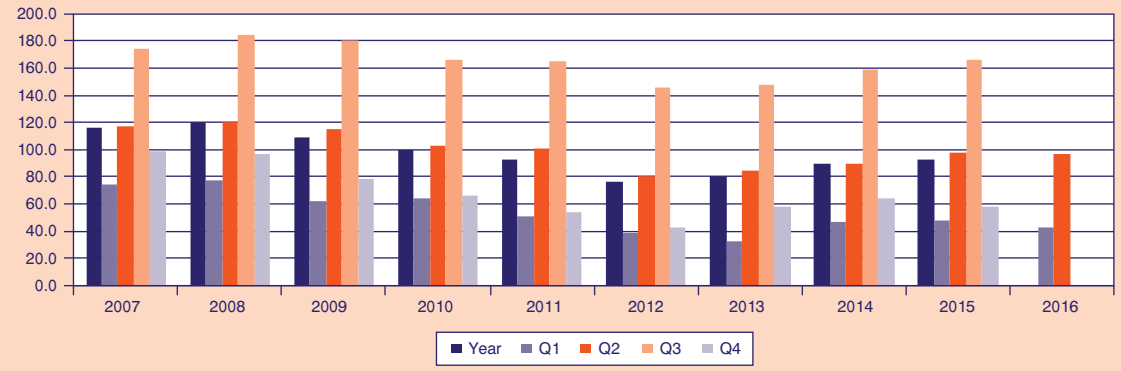
TABLE 4.3.1 Index of Turnover for «Accommodation, Food and Beverage Services»

Year's average and quarters, BASE: 2010=100

	Year's mean	Q1	Q2	Q3	Q4
2005	**105.2**				
2006	**109.0**	67.4	111.4	168.1	89.3
2007	**116.1**	74.1	117.4	174.3	98.3
2008	**119.8**	77.7	120.6	184.3	96.6
2009	**108.9**	62.1	115.0	180.0	78.4
2010	**100.0**	64.0	103.3	166.6	66.1
2011	**92.6**	50.8	101.0	164.7	54.0
2012	**76.7**	38.6	80.0	145.7	42.3
2013	**80.3**	32.1	84.2	147.5	57.6
2014	**89.8**	46.5	89.8	158.8	64.1
2015	**92.6**	48.1	97.6	166.4	58.3
2016	**n/a**	42.5	96.6	n/a	n/a

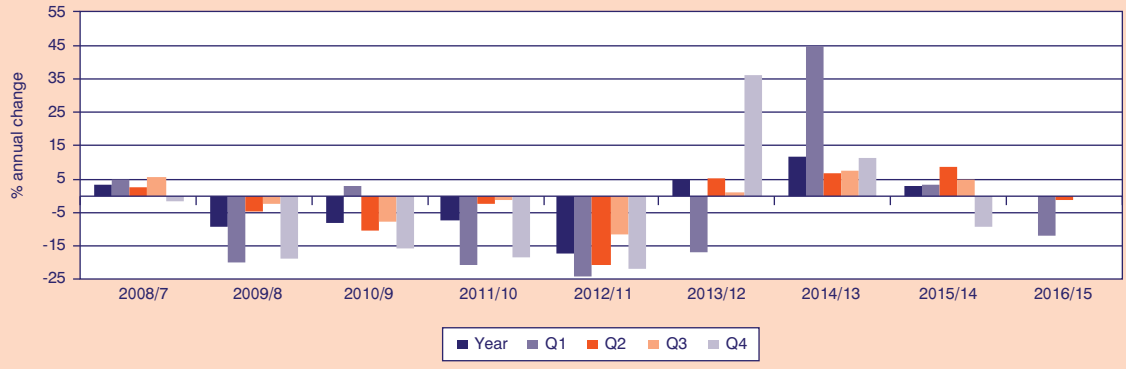
Source: Hellenic Statistical Authority: "Index of Turnover for Accommodation, Food and Beverage Services", Q2 2016, adaptations by the author.

FIGURE 4.3.1
Greece: Index of Turnover for "Accommodation, Food and Beverage Services", 2007-2016
Year's average and quarters, BASE, 2010=100



Source: Hellenic Statistical Authority: "Index of Turnover for Accommodation, Food and Beverage Services" Issue Q2, 2016.

FIGURE 4.3.2
Greece: Index of Turnover for "Accommodation, Food and Beverage Services", 2007-2016
Annual % change of year's average and quarters



Source: Hellenic Statistical Authority: "Index of Turnover for Accommodation, Food and Beverage Services" Issue Q2, 2016.

phenomenon. These changes were also evident in recent quarters and Q4 2015 and Q4 2016 mostly due to the collapse of the domestic non-summer tourism, but also due to the persisting low attractiveness of our urban destinations in the international market –for tourism alternative of the model "sun - sea - sex" (or 'sss'). This is a fact that intensifies the seasonality and the associated problems.

It is noted, however, that the 'stabilization' of the revenues in the second quarter 2016 and a potential increase in Q3 (still unofficial) can not contribute to alleviate the problem of seasonality. Inbound tourism in cities (large or small) as alternatives to 'sss' forms (conference, medical, professional, cultural, religious) may make a contribution to this qualitative restructuring of tourist flows, as domestic tourism has not recovered to adequately influence the increase of arrivals in low demand periods (off-peak).

4.3.2. Analysis of international tourist arrivals by country of origin

The systematic analysis of recent "non-resident arrivals" data[1] in the country are a good indication of tourism flows to Greece and recent trends of visitors by the countries of origin.

The **total number** of visitors arriving in the country for 2008 was 15.939 million people, while in 2009 it decreased to 14.916 million; in 2010 to 15.008 million; in

1. Hellenic Statistical Authority: Non-Residents Arrivals, Q1 2016.

2011 it rebounded to 16.427 million visitors, in 2012 it amounted to 15.518 million travellers, while in 2013 it reached 17.920 million travellers, in 2014 amounted to 22.033 million while in 2015 arrivals reached **23.599** million, a number which is a historical record for arrivals.

Let's look at the arrivals' breakdown by regions and countries of origin, for the period 2008-2015. Figures 4.3.3, 4.3.4 and 4.3.5 show the detailed data.

Europe

Analyzing the origin of visitors, we observe that arrivals from **Europe** (EU **and** other European countries) for 2008 was 14.475 million, accounting for **90.8%** of total arrivals. In 2013 they amounted to 15.778 million and accounted for **88.1%** of total arrivals. In 2014 they amounted to 19.477 million which corresponds to **88.4%** of the total arrivals. In 2015 they amounted to 20.716 million which is a percentage of **87.8%** of the total arrivals observed in particular as follows (see also Figure 4.3.3):

Arrivals from the group of **EU countries** for 2008 was 11.815 million and accounted for **74.1%** of total visitors. These gradually decreased. For 2012 they declined to 9.792 million or **63.1%** of total visitors and in 2013 they amounted to 10.525 million visitors, having reduced to the **58.7%** of total arrivals. In 2014 they became 13.249 million and accounted for **60.1%** of total visitors, and in 2015 they amounted to 14.974 million and accounted for **63.5%** of total visitors.

The gradual decline of tourists from the EU, from 75% to the level of 62% is considered significant and systemic, and not easy (or possible) to reverse without significant changes in the structure of the tourist product and a holistic approach to tourism. In contrast, arrivals from non-EU European countries have followed a steady growth during the period both in absolute numbers and in relation to their share of total arrivals.

Specifically, for 2008 the rate was around **16.7%**. In 2013 it rose to **29.4%**, in 2014 to **28.3%**, in 2015 to **24.3%** of total arrivals in the country. And here a particularly important change to the map of tourist source countries may be assessed, where non-EU countries appear to stabilize at levels around 25% of all foreign tourists.

Of course, each market separately has its own value (see also Figure 4.3.4 and 4.3.5.) As regards the distribution of arrivals of non-residents by country as a percentage of the total, the largest contribution for 2015 was held by Germany with **11.9%** (13.6% in 2012 and 15.5% in 2008), followed by the UK with **10.2%** (12.4% in 2012 and 14.3% in 2008), France with **6.4%** (from 5.7% in 2008), Italy with **5.7%** (from 6.9% in 2008), and Russia with **2.2%** (from 6.7% in 2014 and 1.9% in 2008). The great variation of arrivals of Russian tourists is attributed to effective marketing of Greek tourism in Russia, and the economic problems of this country. Also note that the traditional markets of Germany and the United Kingdom show continuous percentage decline over the period considered. Note also the significant flow of Serbian tourists, and the upward trend from Switzerland.

Asia

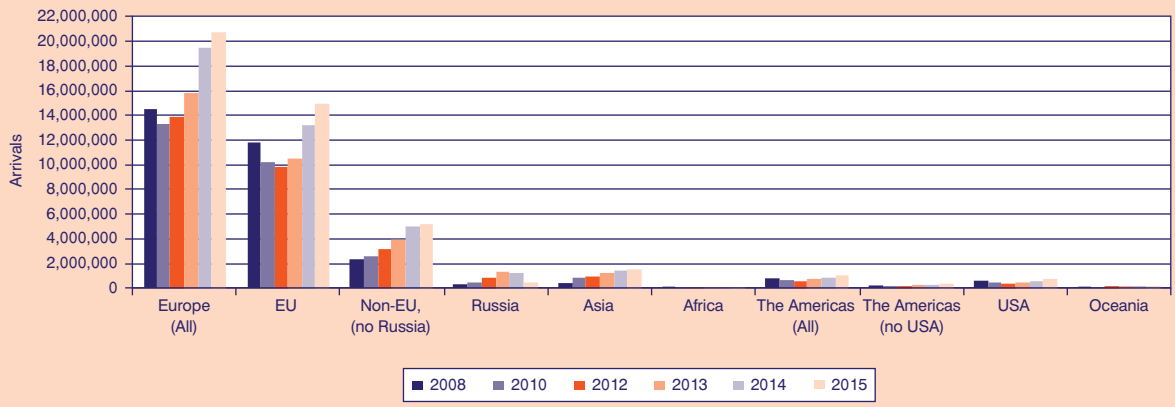
Visitor arrivals from Asia show significant growth. In particular, in 2015 there were 1,515 million, in 2014 1,412 million people, in 2013 1,353 million, while in 2012 there were 875,000 people compared to just 385 million in 2008. In 2015 and 2014 arrivals from Asia accounted for **6.4%** of total arrivals in our country, in 2013 amounted to **6.8%** compared to only **2.4%** in 2008. As shown, arrivals from Asia mark an upward trend that almost triples between 2008 and 2015. The main country that contributed to this is Turkey, accounting for 4.9% of the 6.4% of the 'Asian' arrivals, or 1.153 million visitors in 2015 (compared to 602 thousand in 2012 and 208 thousand in 2008). Israel remains the next major country in terms of tourist flows, but significantly declines, with 116 thousand tourists in 2015, compared to 212 thousand in 2013 and 208 thousand in 2012. We must also note the steadily increasing trend from **China** with 55 thousand tourists in 2015, compared to 47 thousand in 2014, 28 thousand in 2013, 12 thousand in 2012 and 6 thousand in 2008, which is a significant, **tenfold** increase since 2008, but the figures are still small. Increased tourist arrivals are recorded from Lebanon and Syria, from 13 thousand in 2012 to 36.6 thousand in 2013, to 32 thousand in 2014 and 31 thousand for 2015, but unfortunately, also because of the war there. South Korea sent 20 thousand visitors in 2015 and Iran, some 10,500.

America - Oceania - Africa

Overall, the arrivals from the **Americas** show recovery. They amounted to 1,094 million in 2015, compared to 890.3 thousand in 2014, to 754.5 thousand in 2013, and compared to 849 thousand in 2008. The majority clearly comes from the US, with 750 thousand visitors in 2015, corresponding to 3.2% of all foreign tourists in our country in the same year. The recovery needs to be continued and stabilized by activation of our tourism marketing on the continent.

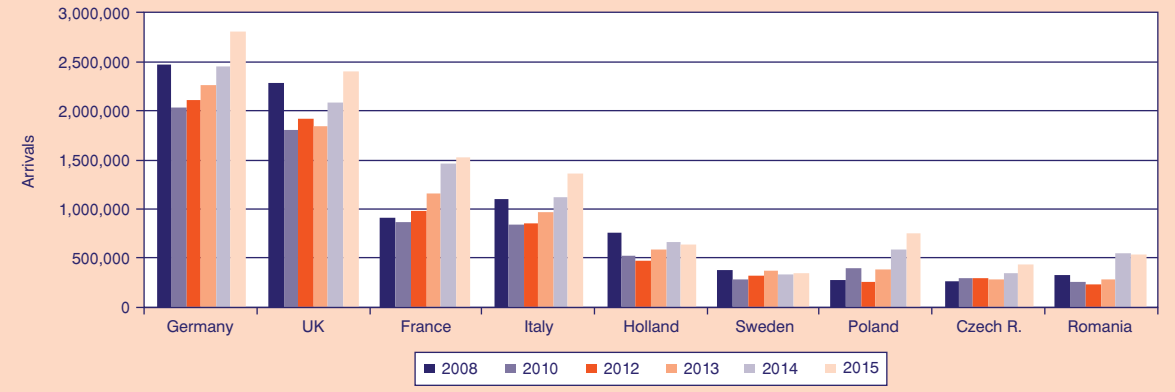
From **Oceania** 212 thousand visitors came to Greece in 2015, compared to 205 thousand in 2014, 143 thousand in 2013, compared to some 160 thousand visitors in 2008.

FIGURE 4.3.3
International tourist arrivals to Greece, Selected geographical origins, Years 2008-2015



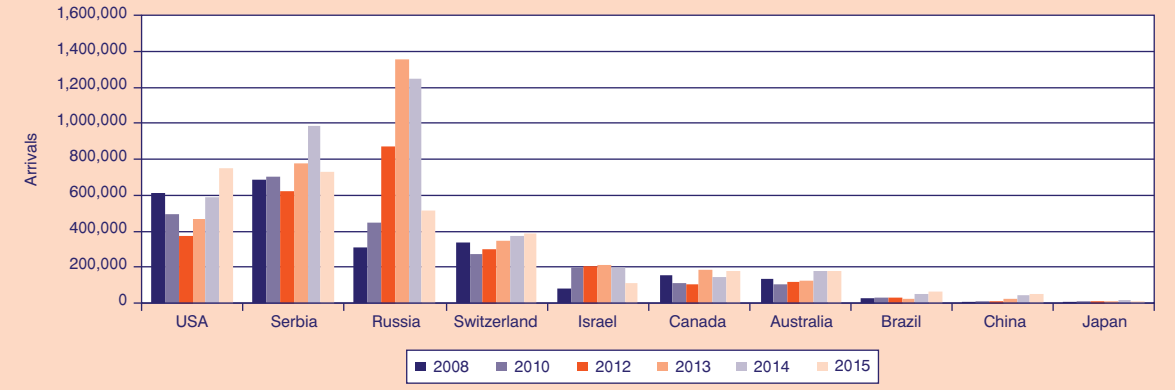
Source: Hellenic Statistical Authority: *Non-Residents Arrivals, Q2 2016.*

FIGURE 4.3.4
International tourist arrivals to Greece from selected EU countries: Years 2008-2013



Source: Hellenic Statistical Authority: *Non-Residents Arrivals, Q2 2016.*

FIGURE 4.3.5
International tourist arrivals to Greece from selected countries outside the EU: Years 2008 - 2015



Source: Hellenic Statistical Authority: *Non-Residents Arrivals, Q2 2016.*

Finally, in 2015, 61.6 thousand visitors came from **Africa**, of which 26 thousand were from South Africa and another 26 thousand were from Egypt and Sudan.

In Figure 4.3.3 the international tourist arrivals in Greece from selected geographical areas are shown. It can be noted that the European countries remain the main and most important feeder of Greek tourism. In particular, the EU countries showed a fluctuating trend, which seems to have recovered and may stabilize at higher levels in the future. Besides, the increase of the other European countries becomes obvious as are the developments with Russia. As regards the other continents, arrival trends are significantly increasing from Asia and America. The respective proportions of sizes should of course be taken into account (see Figures 4.3.4 and 4.3.5).

4.3.3. Conclusions

Tourist revenues up to 2012 show a steady decline, compared to 2008. The year 2013 was the turning point, and since then revenues have marked a recovery, which continued in 2014 and 2015. In 2016, for the first and second quarter, there was again a small halt in revenues. The overall result is not bad, but it is not relevant to our capabilities. Revenues in 2008 and 2010 have still not been achieved. The conditions in the Mediterranean are particularly favourable in view of the situation in North Africa and the near east. The continuous increase of mass tourism arrivals –which possibly may show its limits for a while– is not able to bring significantly more revenue. The problems in Russia were felt. We need to achieve an increase of tourism consumption. Not with a price increase, but with a continuous effort to enrich and broaden the product offered. Also with the support and promotion of special forms of tourism and activities –e.g. medical, congress, ecological, tasting, wellness and rehabilitation, museums, festivals, sports, etc. These differentiate the tourist product of the stereotype “sun - sea” acting additively and not as rivals, increasing tourism consumption and helping extend the tourist season, while new markets open up. It is also noted that it is appropriate to consider ways of exploiting the country’s resources in low demand periods (1st and 4th quarter) where demand is recorded from several markets (typical example is China), especially with regard to urban centres. Finally, it should be noted that the significant downturn in domestic tourism, in particular during the first and fourth quarters, is largely due to the partial cancellation of the Christmas bonus in the domestic salaries, to the overall reduction in disposable income due to taxation (high rates and multiplicity of taxes) and finally, to the persisting high general unemployment, in particular among young people.

4.4. Analysis of the industrial sector based on industrial production and turnover indices

Georgia Skintzi

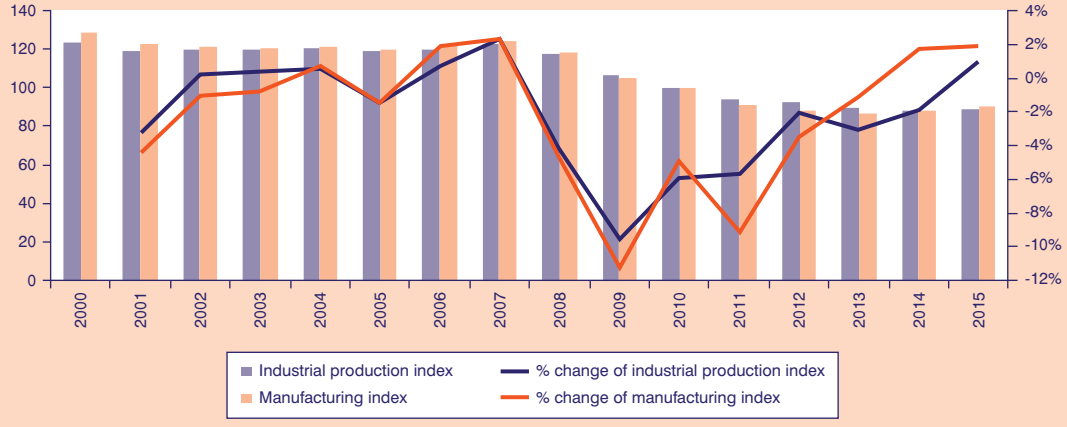
Industrial production is an extremely important variable since it largely depicts the economic activity and is directly linked to the economic performance of a country. The analysis focuses on industrial production and industry turnover indices, and aims to present the latest developments and identify perspective indications as far as the evolution of the industrial sectors is concerned.

4.4.1. Industrial production indices

Figure 4.4.1 illustrates the industrial production index[1] and the manufacturing index,[2] as well as the percentage changes of both indices. The negative effects of the economic crisis on industrial production became apparent in 2008 when both indices started to decrease. The industrial production index decreased for seven consecutive years, from 2008 until 2014. In 2015 it demonstrated a marginal increase of 1% (compared to the previous year). The manufacturing index decreased continuously from 2008 until 2013. In 2014 the index increased by 1.8% and in 2015 decreased by 1.9%. Compared to 2007, the industrial production index decreased by 27.6%, while the manufacturing index decreased by 27.7%. These significant reductions demonstrate the extent to which the economic crisis has affected the industrial production of Greece.

In order to follow the evolution of the two indices in greater detail, Figure 4.4.2 illustrates the percentage changes of the monthly industrial production index and the manufacturing index compared to corresponding months of the previous year. Both indices follow a similar course. In 2014, the first signs of recovery appeared. The industrial production index increased for two consecutive months (October and November 2014), for the first time since 2007. The manufacturing index increased for seven consecutive months (from October 2014 until April 2015). The monthly changes of both indices are positive for most of the months in 2015 (May, June, July and October constitute the only exceptions). It should be noted that in July 2015 a referendum took place, while during the previous months Greece was amidst important negotiations with the European Union. Moreover, in September 2015 national elections were held. From January 2016 until July 2016 (latest available data) the industrial production index increased continuously with the exception of February and March. In June 2016 the index increased by 7.61%, the second largest increase during the period under examination (January 2001-June 2016). The largest increase was recorded in December 2002, 7.78%. The same month (June 2016), the manufacturing index recorded the third largest in-

FIGURE 4.4.1
General industrial production index and manufacturing index and their percentage changes



1. The index of industrial production incorporates the following sectors: mining and quarrying; manufacturing; electricity, gas, stream and air-conditioning supply; and water collection, treatment and supply. Base year is 2010 and the data are seasonally adjusted.

2. The manufacturing index is a sub-index of the general industrial production index, the weight used is 69.53%.

FIGURE 4.4.2
Percentage changes in the industrial production index and the manufacturing index, compared to the corresponding month of the previous year

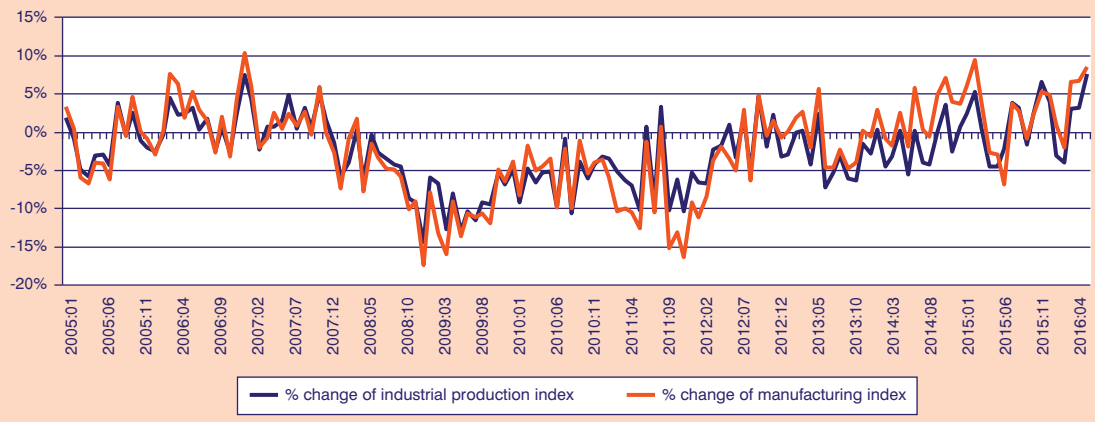
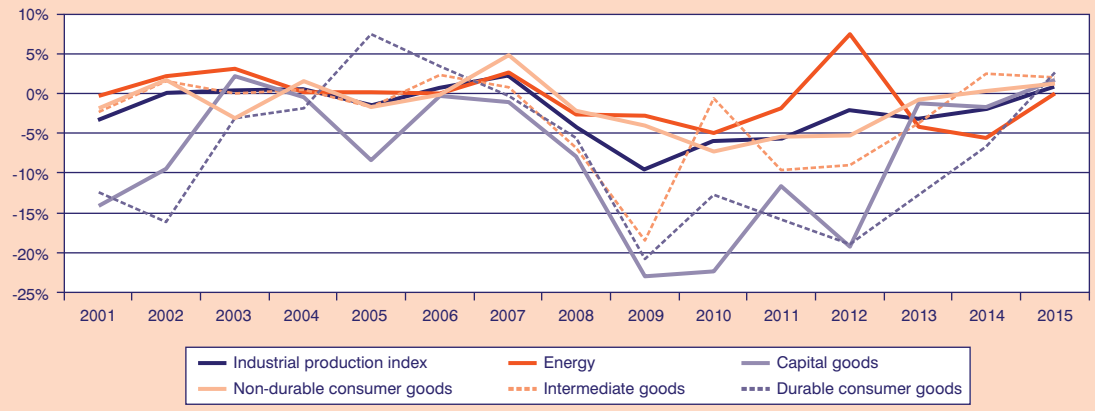


FIGURE 4.4.3
Percentage changes of the industrial production indices, compared to the previous year



crease. Larger increases were observed in January 2007 (10.37%) and March 2015 (9.38%).

Important information is also provided by the indices of energy, intermediate, capital, durable consumer and non-durable consumer goods. Figure 4.4.3 presents the percentage changes of these indices compared to the previous year. From 2008 until 2014, all five indices decreased. The only exceptions are the energy index that increased in 2012 by 7.5%, the intermediate goods index that increased in 2014 by 2.5% and the non-durable consumer goods index that increased in 2014 by 0.3%. In 2015, all indices increased. The durable consumer index increased by 2.7%, followed by the intermediate goods index that increased by 2.1%. The capital goods index increased by 1.8%, while the non-durable consumer goods index increased by 1.3%. The energy index remained stable.

4.4.2. Industrial turnover indices

Important information can also be drawn from the industrial turnover index.[3] Figure 4.4.4 illustrates the industrial turnover indices (general, domestic market and non-domestic market), while Figure 4.4.5 presents the percentage changes of the three indices. All three indices decreased significantly, by more than 22%, in 2009 compared to 2008 (the non-domestic market index decreased by more than 25% in 2009). The domestic mar-

3. The general index of industrial turnover incorporates the following sectors: mining and quarrying, and manufacturing.

FIGURE 4.4.4
Turnover indices

FIGURE 4.4.5
Percentage changes of industry turnover indices, compared to the previous year

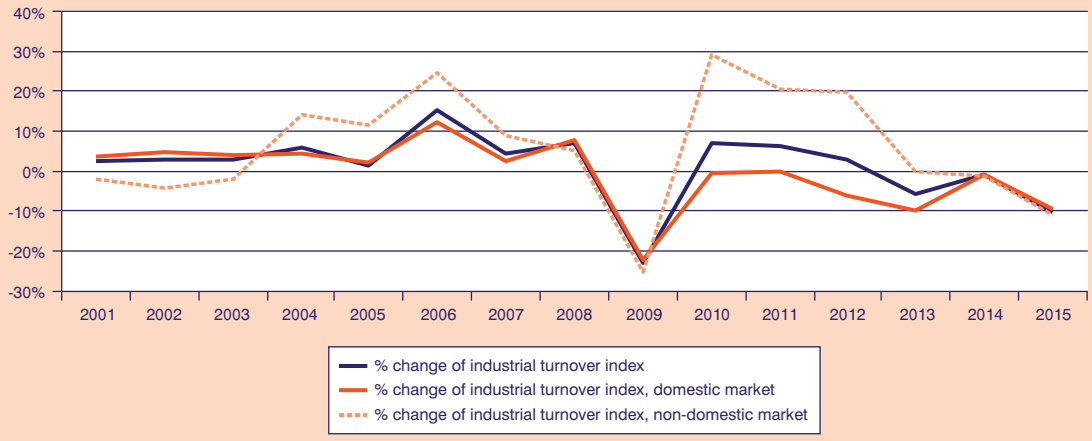
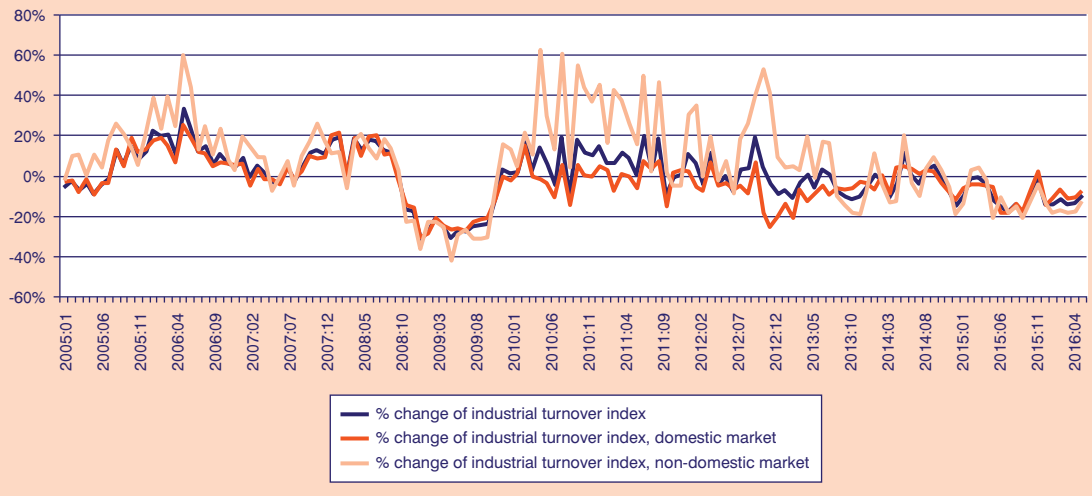


FIGURE 4.4.6
Percentage changes of monthly industry turnover indices, compared to the corresponding month of the previous year



ket index continued to decrease until 2015, when the third largest decrease of the period under investigation (2001-2015) is recorded, 9.4%. Moreover, for the first time the index fell below 80 (75.8). Following the significant fall in 2009, the non-domestic index recorded significant increases over the next three years (2010-2012) ranging from 19%-29%. During the last three years under examination (2013-2015) the index decreased. In 2015, the index recorded the second largest decrease, 11.1%. The general turnover index follows a similar course. The index increased during 2010-2012 and decreased during 2013-2015. In 2015, the second largest decrease is recorded, 10.1%. Moreover, for the first time since 2010, the index fell below 100, reaching 91.4.

In order to follow the evolution of the three indices in greater detail, Figure 4.4.6 illustrates the percentage changes of the monthly turnover indices compared to the corresponding months of the previous year for the period January 2005-June 2016. From November 2014 until June 2016 the general turnover index decreased continuously. During the first semester of 2016 the monthly reductions exceeded 9% (i.e. every month is at least 9% worse than the corresponding month of 2015), while the smallest reduction of the semester was recorded in June (9.4%). The domestic market index reduced continuously from November 2014 until June 2016 (December 2015 is the only exception). The non-domestic market index reduced continuously from May 2015. During the first semester of 2016 the monthly reductions exceeded 12%, while in June the smallest reduction of the semester is recorded (12.7%).

4.4.3. Industrial production indices of the food sector

The food sector is one of the most important sectors of industrial production in Greece. The weighting coefficient of food in the industrial Production index is the second highest (13.81%), after the production and distribution of electricity (20.64%), and is followed by Coke and refined petroleum products (10.48%). The contribution of the remaining sectors is below 6%.

Figure 4.4.7 illustrates the evolution of the annual industrial production index of the food sector and the

FIGURE 4.4.7
Industrial production index of the food sector and its annual changes

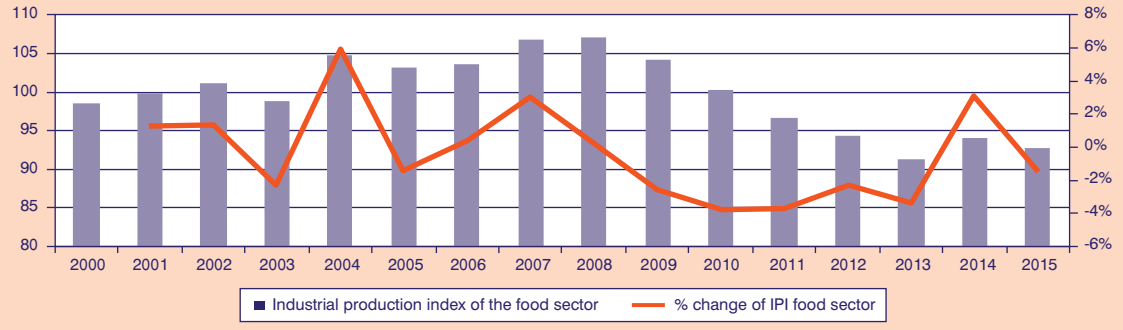
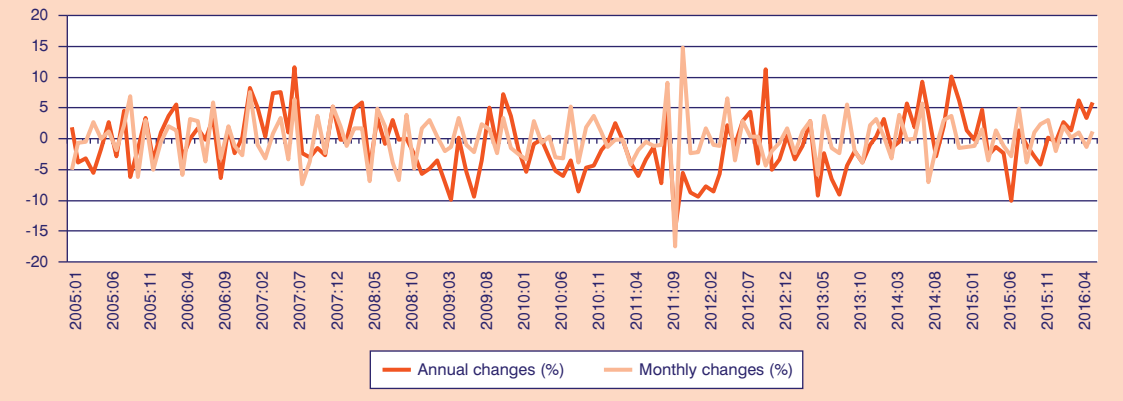


FIGURE 4.4.8
Annual and monthly changes of the monthly industrial index of the food sector



percentage changes of the index. The index took the highest value in 2008 and the lowest in 2013. From 2008 until 2013, the index decreased continuously, while in 2014 it increased by 3% and in 2015 it increased slightly by 1%. It should be noted that the turnover index of the food sector increased in 2015, compared to 2014, by 4.5%. The domestic market index and the non-domestic market index also exhibited an increase by 3.5% and 8.1%, respectively.

Figure 4.4.8 presents the annual (every month is compared with the corresponding month of the previous year) and the monthly (every month is compared with the previous month) changes of the industrial production index of the food sector. The first half of 2016 is encouraging, with the exception of January, which recorded a marginal decrease of 0.4% compared to January 2015, the remaining months increased compared to the corresponding months of the previous year.

4.4.4. Conclusions

For the first time since 2008, the industrial production index in 2015 recorded an increase, albeit marginal, in the range of 1%. The manufacturing index also exhibited an increase in 2015, for the second consecutive year. The data for the first half of 2016 are encouraging as both indices recorded mainly increases. Furthermore, the indices of the main industrial groupings (energy, intermediate, capital, durable and non-durable goods) increased in 2015 compared to the previous year. On the other hand, the industrial turnover indices decreased significantly in 2015. The reduction of the general index exceeded 10%. The non-domestic market index recorded the highest drop in the last 15 years, after the decline of 2009. Nevertheless, it should be noted that both the general turnover index and the non-domestic index remained, in 2015, higher than the corresponding averages of the last sixteen years.

The homogeneity of the NPLs determinants in the different categories of loans[1]

Yannis Panagopoulos*
Ioannis Peletidis**

1. Introduction

This article is a supplement to the previous one (*Greek Economic Outlook*, Vol. 30)[2] which classified the aggregate Non-Performing Loan (NPLs hereafter) determinants of the four (4) systemic Greek banks[3] during the economic crisis (2007-2015). Our intention, in this paper, is to reveal and classify the determinants of the NPLs in the different categories of loans. These categories are: (1) *mortgage loans*, (2) *consumer, credit card & other loans* and (3) *business loans*. Additionally, we will examine the homogeneity of these determinants. Revealing these determinants is vital for the banking system of the country since it is helpful for understanding the NPLs' generation process in the different categories of loans and, consequently, the mechanism that creates the equity provisions needs, which is important for any future bank re-capitalization.

The remainder of the paper is structured as follows. Section 2 presents a short description of the different categories of the loans. Moreover, it shows the structure of the systemic banking portfolio (the categories of loans) and the corresponding NPLs in these different categories for the time period of the crisis (2007-2015). Section 3 presents a short review on the NPL issue and the selection of the estimating model. Section 4 describes the data and the panel econometric methodology which will be implemented while Section 5 reports the empirical results and a discussion on the existence of homogeneity of the NPL determinants. Finally, Section 6 concludes.

2. Loan categories and their NPLs

As we mentioned before, there are three categories of loans which are officially reported in the *Annual Financial Statements* and the *Annual Reports* of the four systemic banks: (1) *mortgage loans*, (2) *consumer, credit card & other loans* and (3) *business loans*. More analytically:

Category 1: *mortgage loans*

These loans are provided from the banks to the borrowers usually for buying a house. They are basically long-term loans and their duration is often longer than 10 years. They are repaid monthly. The lenders (banks) consider these newly bought houses as collateral. The interest rates of these loans are usually floated.

Category 2: *consumer, credit card & other loans*

These are loans or credit limits (e.g. credit cards) which are provided from the banks to their clients for buying every kind of consumer goods and/or services. Their duration begins with one month (credit cards) and can reach five (5) or even more years. Due to their small duration the interest rates are basically fixed. These are usually covered with some collateral. They can be repaid once or even in monthly installments.

Category 3*: business loans*

These loans are provided to all sizes of firms (big, medium and small). We further discriminate them into long and short-term loans. Usually the long-term loans are given to a firm for the acquisition of buildings, machines, etc. On the other hand, the working capital needs are short-term loans and are used for covering the everyday exchange circulation needs of firms/companies. The cost of issuing a business loan, on behalf

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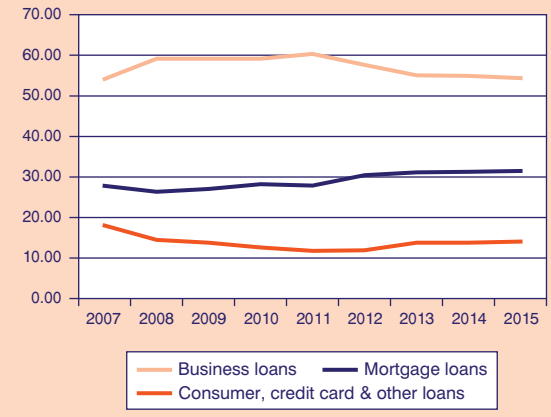
** Former Deputy Director, Center of Entrepreneurship, Emporiki Bank.

1. Special thanks are due to F. Economou for helping us with the proper use of the Stata 14.0 econometric package.

2. See Economou, Panagopoulos & Peletides (2016), *Greek Economic Outlook*, vol. 30.

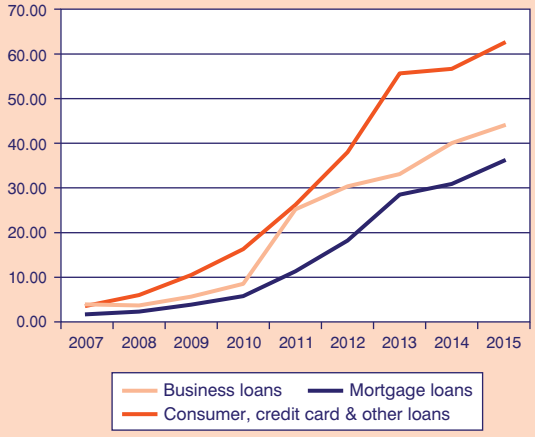
3. More specifically, the National Bank of Greece (ETE), Eurobank, Alpha Bank and Piraeus Bank. The sum of these banks' assets constitutes 90% of the Greek banking system.

DIAGRAM 1
The structure of the banks' portfolios in different categories of loans (%)



Source: Balance sheets of the four banks.

DIAGRAM 2
The percentage of the NPLs in the different categories of loans (all systemic banks)



Source: Balance sheets of the four banks.

of the borrower, differs according to the loan's category, level of coverage, etc. The interest rates of these loans are mixed (e.g. part is fixed and part is floating). Finally, most of these loans are with collateral.

In Diagram 1, the structure of the different categories of loans, as a percentage of the banks' total loan portfolio, is presented for the time period 2007-2015.

In Diagram 1, the distribution of the different categories of loans for the examined time period becomes obvious. More specifically, the biggest part of loans belongs to the *business* category with a percentage (%) that ranges between 54.1% and 60.3% of the total loan portfolio during the examined time period. The second biggest part of loans belongs to *mortgages* with a percentage that ranges between 26.3% and 31.5%. Finally, the smallest part belongs to *consumer, credit card & other loans* with a percentage that ranges between 11.7% and 18.0% of the total loan portfolio.

In Diagram 2, the percentage (%) of NPLs for every category of loans (of all the systemic banks) for the examined time period is presented.

According to Diagram 2, the high correlation between the accumulated recession of the Greek economy and the NPLs of its systemic banks is almost obvious. More analytically, although all the NPL categories before the crisis (2007) were below 4% (*mortgages* 1.7%, *consumer, credit card & other loans* 3.6% and *business* loans 3.9%), with the beginning of the crisis[4] the trend became upward. More analytically, in 2009, the NPLs of *consumer, credit card & other loans* reached 10.48%, *business* NPLs reached 5.6% and *mortgage* NPLs reached 3.8%, of their corresponding loans. The NPL picture explodes after 2011 in all categories of loans and reached double digit numbers. More specifically, in that year the NPLs of the *consumer, credit card & other loans* category reached 26.2%, the *business loans* category reached 25.2% and *mortgages* reached 11.3% of their corresponding loans. At the end of 2015, things got even worse. Analytically, the NPLs of *consumer, credit card & other loans* category reached 62.5%, the *business loans* category reached 44.0% and *mortgages* reached 36.1% of their corresponding loans. Finally, we should mention here that on 31/12/2015, from the total amount of €233.2 billion in loans of the four systemic banks, *business loans* were €126.8 billion, *consumer, credit card & other loans* were €32.9 billion and *mortgages* €73.4 billion.

The aforementioned evidence brings forward the consistency, regarding loan repayment, which *mortgage* category shows with respect to the other two categories. This characteristic is probably linked with the borrower's priorities. More analytically, such behavior is linked with the fact that most of the *mortgages* are covered with collateral which, basically, is the house of the borrower. This implies that in the case when the borrower does not pay his/her *mortgage* then, after some period of time, the bank can set its house in an auction. Next, regarding loan repayment consistency, are the *business loans* because of their importance for the

4. In 2009 with the recession at -4.3% (see ELSTAT 2016, the *Greek Economy Report*).

country's production and employment status. On the other hand, we have the NPLs of the *consumer, credit card & other loans* category which usually are without any coverage and are scattered throughout many different banks. These NPLs, as we already mentioned, showed the biggest growth with respect to the other two categories.

3. Review of the literature

Concerning now the explanatory factors of the NPLs, as it is also discussed in the article of Economou, Panagopoulos & Peletides (2016), the existing literature often separates them into two main categories: the macroeconomic[5] determinants and the special banking[6] determinants. Table 1, in the aforementioned article, analytically presents the classification of these factors. Finally, an econometric mix of these two big categories of determinants is widespread in the existing empirical literature of the NPLs.[7]

In this empirical study, with the three different categories of NPLs, we will proceed like we did in the aggregate case[8] by implementing in the Greek banking system the Khemraj & Pasha (2016) model. More analytically, this NPL theoretical model has the following algebraic form:

$$\begin{aligned} \ln NPL\_A_{i,t} &= c + \sum_{t=1}^{i} \beta_i \ln NPL\_A_{i,t-i} + \\ &+ \gamma \ln L\_A_{i,t} + \delta \ln \left(A_{i,t} \Big/ \sum A_{i,t} \right) + \\ &+ \phi \Delta LOANS_{i,t} + \theta \Delta GDP_{i,t} + \rho \Delta UN_{i,t} + \zeta DY_t + \varepsilon_t \end{aligned} \quad (1)$$

Where: *NPL_A* stands for the ratio of NPLs divided by the assets of bank *i*, *L_A* stands for the ratio of the loans divided by the assets of bank *i*, Δ*GDP* stands for the real GDP growth, Δ*UN* stands for the percentage change of the unemployment, Δ*LOANS* stands for the percentage change of the loan portfolio of bank *i*, $\left(A \Big/ \sum A\right)$ stands for the size of bank *i* as a share of the total market and is represented by the ratio of bank *i* assets divided by the aggregate assets of the banking system, and, finally, *DY* stands for the dummy which takes the value of 1 from 2013 to 2015 and represents the period of multi-mergers and acquisitions of the non-viable banks from the systemic part of the market.

4. Data and econometric methodology

The data of our empirical research are derived from two different sources: the macroeconomic determinants (e.g. GDP and unemployment) from ELSTAT on yearly basis and the special banking determinants (e.g. the NPLs, the assets of each bank, the loan portfolios) from the *Balance Sheets* of the four systemic banks (e.g. the National Bank of Greece, Eurobank, Alpha Bank and Piraeus Bank), for the time period ranging between 2007 and 2015.

For the estimation of the aforementioned theoretical model (1) panel data methodologies will be implemented. More specifically, the fixed effects, the random effects as well as a dynamic panel approach (GMM: Generalized Method of Moments). In the last case, the Arellano-Bover/Blundell-Bond (1995, 1998) panel approach will be implemented in order to account for serial correlation and endogeneity.

5. Empirical results

In Table 1a, 1b and 1c we analytically present the empirical results from model (1) for *mortgage loans*, *consumer, credit card & other loans* and, finally, *business loans*. The first two columns in each Table (columns 1 and 2) present the results of the fixed and the random effects models, respectively. The last column (column 3) presents the empirical results using the Arellano-Bover/Blundell-Bond methodology.

From the results of Tables 1a, 1b and 1c the significant common and non-common determinants of the different categories of the NPLs emerge. For example, in Table 1b it becomes evident that in the category of *consumer, credit card & other loans* the statistically significant NPL determinants appear to be only from the banks' specific factors (with the exception of a single macroeconomic variable in the results of Arellano-Bover/Blundell-Bond approach). The empirical results in the other two categories of NPLs are much more mixed in terms of determinants. More specifically:

Mortgages: the most statistically significant factors of the NPL determinants, from the point of view of the banks' specific factors, seem to be the size (the amount) of the previous period's NPLs ($\ln NPL\_A_{i,t-1}$). This is explained by the fact that in the period under

5. See Bernanke, Gertler & Gilchrist, 1998; Nkusu, 2011, etc.

6. See Berger & DeYoung, 1997; Keeton & Morris, 1987, etc.

7. See for instance, Fofack, 2005; Khemraj & Pasha, 2016; Loyzis, Vouldis & Metaxas, 2012; Makri, Tsagkanos & Bellas, 2014; Beck, Jakubik & Piliou, 2015, etc.

8. See analytically Economou, Panagopoulos & Peletides (2016).

TABLE 1a Empirical results of the Mortgage loans NPLs (Dependent variable: ln*NPL_A*)

Variables	Fixed effects (1)	Random effects (2)	Arellano-Bover/Blundell-Bond (3)
		Special banking factors	
Const	0.256	-0.285	0.425
	(0.740)	(0.533)	(0.517)
ln $NPL\_A_{i,t-1}$	0.511	0.593	0.589
	(0.001)***	(0.000)***	(0.000)***
ln $L\_A_{i,t}$	1.803	1.064	1.539
	(0.027)***	(0.009)***	(0.000)***
$\ln\left(A/\sum A\right)_t$	-0.408	-0.212	-0.276
	(0.395)	(0.470)	(0.175)
$\Delta LOANS_t$	-0.00005	-0.00003	-0.00004
	(0.111)	(0.215)	(0.230)
		Macroeconomic factors	
ΔGDP_t	-0.652	-0.964	-0.684
	(0.876)	(0.805)	(0.802)
ΔUN_t	0.077	0.069	0.085
	(0.264)	(0.281)	(0.014) ***
DY	0.663	0.624	0.540
	(0.050) **	(0.026) **	(0.015) ***
Obs.	32	32	32
	R^2:	R^2:	
	within = 0.972	within = 0.971	Wald chi2(3) = 204.22
	between = 0.985	between = 0.995	Prob > chi2 (X^2) = 0.000
	overall = 0.970	overall = 0.975	

Notes: p-values in parentheses.

***, **, * Statistically significant at 1%, 5% and 10%, respectively.

consideration the amount of this category of loans shows a continuously increasing trend. In addition, the ratio of the amount of *mortgages* to the total assets of each bank is statistically significant (ln $L\_A_{i,t}$). This is linked with the idea that this ratio of loans to the total assets is gradually packed with a higher proportion of NPLs (see also Diagram 2). In this case we have the violation of the role of dispersion possibly due to the lower quality of borrowers in the recent years of crisis. This can be considered to have happened, on behalf of banks, due to competition, as an attempt to approach as many customers as possible by relaxing the terms of lending. The importance of these two specific banking factors emerges in all three different estimation methodologies. Regarding the macroeconomic factors, we empirically found that the pseudo-variable (*DY*), which represents the multiple mergers of banks from 2013 onwards, is important in all implemented methodologies. Finally, unsurprisingly, the macroeconomic unemployment variable (Δ*UN*) appears to be significant, but only in GMM estimation. On the other hand, the dependent variable does not seem, at least directly, to be correlated with the change of nominal GDP growth.[9]

Consumer loans-credit cards-other loans: in this category, as already mentioned, the specific banking factors are exclusively or almost exclusively the most important factors of the NPLs determination. More

9. A possible explanation for the lack of explanatory power of the nominal GDP change for the NPLs of mortgages is the explosive and prolonged economic recession in our country which is not observed in other countries and has placed employment (or possibly unemployment) as the most important macroeconomic factor. So the existence, on behalf of borrowers, of stable employment (or unemployment) is emerging here as the most crucial macroeconomic explanatory variable for these NPLs.

TABLE 1b Empirical results of the Consumer, credit card & other loans NPLs (Dependent variable: ln*NPL_A*)

Variables	Fixed effects (1)	Random effects (2)	Arellano-Bover/Blundell-Bond (3)
		Special banking factors	
Const	0.758	0.925	0.672
	(0.389)	(0.218)	(0.205)
$\ln NPL\_A_{i,t-1}$	0.700	0.757	0.698
	(0.000)***	(0.000)***	(0.000)***
$\ln L\_A_{i,t}$	0.843	0.520	0.703
	(0.046)**	(0.068)*	(0.02)**
$\ln\left(A/\sum A\right)_t$	-0.104	0.369	0.097
	(0.811)	(0.280)	(0.545)
$\Delta LOANS_t$	0.000001	0.000001	0.000001
	(0.016) **	(0.003)***	(0.001) **
		Macroeconomic factors	
ΔGDP_t	-7.659	-5.731	-7.060
	(0.125)	(0.225)	(0.012) **
ΔUN_t	-0.044	-0.024	-0.024
	(0.579)	(0.752)	(0.672)
DY	0.135	0.098	0.159
	(0.694)	(0.757)	(0.377)
Obs.	32	32	32
	R^2:	R^2:	
	within = 0.951	within = 0.945	Wald chi2(4) = 6.63e+9
	between = 0.607	between = 0.847	Prob > chi2 (X^2) = 0.000
	overall = 0.931	overall = 0.943	

Notes: p-values in parentheses.

***, **, * Statistically significant at 1%, 5% and 10%, respectively.

specifically, the size of the previous period's NPL's ($\ln NPL\_A_{i,t-1}$) is a very important explanatory variable together with the ratio of the *consumer loans-credit cards-other loans* category to the total assets of each systemic bank ($\ln L\_A_{i,t}$). This happens for reasons which are roughly the same as those reported in the case of *mortgage* NPLs. In addition, the annual change of consumer loans ($\Delta LOANS$) is an important explanatory term but its coefficient is completely insignificant. In terms of macroeconomic factors, we empirically found that the variable of the nominal GDP growth ($\Delta GDPN$) is important but only when we use the GMM methodology, whilst no influence seems to exist from the change in unemployment (ΔUN) to the NPLs. In general, this category of loans seems to follow a trend which is independent from the influence of any macroeconomic factors. Such empirical results allow us to assume that this NPL evolution would have been approximately similar even in the case that the current economic crisis was less intense. This may mean that the behavior of borrowers in this category of loans depends on factors that possibly go beyond our model detection. On the other hand, the fact that the larger bulk of these loans are without coverage and that they are also relatively small sized with a wide dispersion, in the systemic banks, creates very high costs for monitoring and repayment collection (both direct and hours per employee), per loan unit. Perhaps this category of loans will become the first one (and with a very high discount) which the banks will massively sell to the distressed funds.

Business loans: in this category of NPLs the macroeconomic role of nominal growth of GDP ($\Delta GDPN$) is catalytic regardless of the implemented econometric methodology. Concerning now the special banking factors, the size of the previous period's NPLs ($\ln NPL\_A_{i,t-1}$) is a very important explanatory variable. The main illustrative reason for this result is that the majority of these kinds of loans are revolving. This means that any repayment delays made banks much more cautious and sensitive

TABLE 1c Empirical results of the Business loans NPLs (Dependent variable: ln*NPL_A*)

Variables	Fixed effects (1)	Random effects (2)	Arellano-Bover/Blundell-Bond (3)
		Special banking factors	
Const	-4.223	-5.423	-4.595
	(0.225)	(0.081) *	(0.089) *
$\ln NPL\_A_{i,t-1}$	0.704	0.687	0.692
	(0.000)***	(0.000)***	(0.000)***
$\ln L\_A_{i,t}$	2.431	0.914	2.188
	(0.039)**	(0.103)*	(0.004)***
$\ln\left(A/\sum A\right)_t$	-0.192	0.142	-0.079
	(0.739)	(0.772)	(0.881)
$\Delta LOANS_t$	-0.00001	-0.00001	-0.00001
	(0.606)	(0.494)	(0.387)
		Macroeconomic factors	
ΔGDP_t	-19.373	-19.282	-17.451
	(0.011)***	(0.005)***	(0.004)***
ΔUN_t	-0.202	-0.200	-0.162
	(0.099)*	(0.083)*	(0.108)*
DY	-0.173	-0.230	-0.035
	(0.729)	(0.628)	(0.935)
Obs.	32	32	32
	R^2:	R^2:	
	within = 0.902	within = 0.892	Wald chi2(3) = 265.90
	between = 0.890	between = 0.979	Prob > chi2 (X^2) = 0.000
	overall = 0.845	overall = 0.899	

Notes: p-values in parentheses.

***, **, * Statistically significant at 1%, 5% and 10%, respectively.

in renewing them or granting new loans. This event possibly created a credit crunch, during the time period considered, which led to the generation of new NPLs. Finally, the ratio of *business loans* to the total assets in each bank ($\ln L\_A_{i,t}$) is also statistically significant.

6. Concluding comments

In this article an attempt was made to identify the determinants of the different categories of NPLs in the Greek banking system basically during the time period of the economic crisis (2007-2015). Based on the empirical results we experience the existence of common and non-common determinants in these categories of NPLs.

As common illustrative factors (determinants), for all three categories of loans, we observe two of the special banking factors: the size of the previous period's NPLs in each category of loans ($\ln NPL\_A_{i,t-1}$) and the ratio of each category of loans to the total assets of every bank ($\ln L\_A_{i,t}$).

Less homogeneous (less common) proved to be the macroeconomic factors. More specifically, the negative nominal GDP growth has an apparent role on *business* NPLs, during the period of crisis, while this factor is also significant but with less influence on the *consumer, credit card* and *other loans* category. On the other hand, it is not a statistically significant element for the category of *mortgage* NPLs. However, for this category of NPLs, the statistical significance of the change of the unemployment rate (ΔUN) (especially in the GMM approach) is noticeable. Put simply, the priority of borrowers for their *mortgage* repayment is verified here. Finally, the pseudo-variable (*DY*) which was implemented from 2013 onwards, to describe the crucial year during which the non-viable banks bought or merged by the systemic banks, seems to have only affected the category of *mortgages* NPLs.

In conclusion, as we already mentioned above, there are two variables that positively affected the creation of NPLs in all categories of loans: the size of the previous period's NPLs and the ratio of each individual category of loans to the total assets in every systemic bank. These two factors, which looks that they actually "feed" all NPL categories, confirm the immediate necessity for lifting from the banks' portfolio –mainly through the sale to the distressed funds– the highest possible amount of existing NPLs.

On the other hand, the variable of economic growth has a significant negative relationship primarily with the NPLs category of *business* loans and secondarily with the *consumer, credit card & other loans* category. It is further expected that the country's return to economic growth will reduce the NPLs in all categories of the banks' portfolio. Finally, a serious decrease of *mortgage* NPLs will rely, at least in the short run, on the existence of stable employment for the borrowers. Economic growth is also necessary in this category but on a more long-term basis through job creation in the future.

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Technical efficiency evaluation of health care systems in OECD countries

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1. Introduction

The health sector is one of the most important service sectors provided by governments in most countries. Total health care expenditures increased rapidly until 2009 in all European countries due to the ageing of the population and the adoption of new and innovative biotechnologies. According to OECD (2016) health data, OECD countries spent 9% of GDP on average in 2015 in the health sector, of which 6.6% of GDP was public expenditures. The need to analyze the efficiency of health care systems becomes more urgent due to the significant financial contribution of central governments to health systems. Also, the evaluation of health system efficiency could contribute significantly to health policy decision making.

The provision of health services is efficient if its producers make the best possible use of available inputs. The reduction of health care system inefficiency could lead to significant benefits for the citizens. In the literature, many researchers have come to the above conclusion. Puig-Junoy (1998) argued that OECD countries achieved a low degree of technical efficiency, consuming 39% more inputs on average. Evans et al. (2000), evaluated health system efficiency in 191 countries using a parametric analysis, which showed significant variations in the degree of efficiency among countries and a positive relationship between efficiency and per capita health expenditure. Afonso and Aubyn (2005), using parametric and non-parametric techniques, concluded that if the health systems of all countries operated efficiently, input usage could be reduced by about 13 per cent without affecting adversely the level of health of the population. Bhat (2005) supported that differences in health care systems could influence significantly the degree of efficiency. Countries in which physicians are paid in wages and salaries or countries with capitation have had higher efficiency than fee-for-service countries. Countries in which a primary care physician acts as a gatekeeper[1] were also more efficient than countries without gatekeepers. Afonso and Aubyn (2006) concluded that OECD countries could improve their health care final outcome by 40% using the same quantity of inputs. Also, they showed that inefficiency was strongly related not only to the organization and operation of health care systems but also to variables beyond the control of governments. Better education level or higher per capita GDP seems to influence positively the degree of technical efficiency of health care systems while unhealthy lifestyles and consumer habits, such as obesity and smoking, influence negatively the health systems. Spinks and Hollingsworth (2009) reported that the degree of technical efficiency reduced for a number of OECD countries during the period 1995-2000. Medeiros and Schwierz (2015), evaluating the relative efficiency among European countries, concluded that the life expectancy at birth could be increased by 2.3%, or 1.8 years, if technical inefficiency could be eliminated.

The aforementioned studies demonstrate potential inefficiencies of health care systems (Medeiros and Schwierz 2015): (i) suboptimal mix between public and private funding, (ii) mismatch of staff skills, (iii) suboptimal provision of primary health care services, (iv) unnecessary use of hospital facilities and specialist physicians, (v) too limited number of one-day surgeries and missing concentration of hospital services, (vi) lack of managerial skills and deficiencies in governance of health services, (vii) insufficient data collection, information technology use and health technology assessment to improve decision-making processes, (viii) inadequate access to health promotion and disease prevention.

The evaluation of the technical efficiency of health care systems raises theoretical and empirical issues. From a methodological point of view, both parametric methods (stochastic frontier analysis, panel regression analysis) (i.e. Medeiros and Schwierz 2015; Greene 2004; Gerdtham and Lothgren 2001; Evans et al. 2000) and non-parametric methods (Data Envelopment Analysis [DEA], Directional Distance Function) (i.e. Medeiros and Schwierz 2015; Afonso and Aubyn 2006; Afonso and Aubyn 2005; Spinks and Hollingsworth 2009; Bhat 2005; Retzlaff-Roberts et al. 2004; Puig-Junoy 1998; Cheng and Zervopoulos 2014) have been used in the

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1. A primary health care physician who meets the patient' needs and preferences, taking into consideration the rational use of medical services. The physician acts as an agent of the third-party payers and not of the patients. His decisions are based on various factors including the needs of patients, the hospitalization cost, the patients' expectations for successful therapy and the availability of facilities, staff and medical equipment.

literature, using cross-sectional data or/and panel data in a one, two or three-stage analysis. From an empirical point of view, the relationship between inputs, intermediate outputs and final outcome is complex and miscellaneous. The inputs and outputs differ among countries according to their quantitative and qualitative determination while the final outcome is influenced by the consumer's lifestyle and environmental factors that are beyond the control of health systems (Jacobs et al. 2006). Also, the availability of data is limited over time and among countries eliminating the usage of various models.

The aim of this article is to measure the technical efficiency of health care systems in OECD countries using the non-parametric two-stage DEA approach. In a first stage, we determine the output-oriented technical efficiency score for each country using the DEA method. The purpose is to evaluate how much the outcome (life expectancy at birth) could be improved without changing the technology and the input quantities used in a health system. In a second stage, the technical efficiency DEA scores estimated in first stage are regressed with respect to environmental variables, such as per capita GDP, dietary habits, alcohol consumption etc., using Tobit analysis. The discussion of empirical results focuses on the position of Greece relative to the other OECD countries.

2. Methodology

An output-oriented DEA model (Charnes, Cooper and Rhodes 1978; Banker, Charnes and Cooper 1984) is adopted for the measurement of technical efficiency ($TE_O(x_i, y_i)$) by solving a linear programming problem for each country $i = 1,....I$ with $m = 1$ output (y_i) and $n = 1,...,N$ inputs (x_i). More specifically, the degree of technical efficiency is given by the solution of the following linear programming problem (Fare, Grooskopf and Lovell, 1994, p. 99):

$$\begin{aligned} &\frac{1}{TE_o(x_i, y_i)} = \max \theta_i \\ &s.t. \theta_i y_{im} \leq \sum_{i=1}^{I} z_i y_{im}, \qquad m = 1 \\ &\sum_{i=1}^{I} z_i x_{in} \leq x_{in}, \qquad n = 1,....N \\ &\sum_{i=1}^{I} z_i \leq 1 \end{aligned} \tag{1}$$

The term $\theta_i \geq 1$ refers to the degree of technical efficiency, i.e. it measures the technical efficiency of the i country's health care system as the distance from the best practice production frontier. If $\theta_i < 1$, then the country is located inside the frontier (i.e the health system is inefficient). If $\theta_i = 1$, then the country is located on the frontier (i.e. the health system is fully efficient). The vector $z = (z_1,...z_i)$ is a vector of constants that measures the weight used to compute the location of an inefficient country if it were to become efficient. The restriction $\sum_{i=1}^{I} z_i \leq 1$ introduces constant returns to scale (CRS) for the production technology.

In practice, the degree of technical efficiency is influenced by a number of environmental variables (i.e. socio-economic factors) that are beyond the control of health systems and/or governments and play an important role in determining the heterogeneity among countries, affecting the final outcome of health systems. Such environmental variables could be household income, consumer dietary habits, alcohol consumption, education level, ageing population level, etc. We could include these environmental variables directly in the DEA linear programming problem. However, this could create problems, firstly, as to the determination of the positive/negative impact of environmental variables on the degree of technical efficiency and, secondly, the violation of disposability and convexity assumptions.

Many studies used two and three-stage DEA models to avoid the aforementioned problems. According to Ray (1991), the degree of technical efficiency $\hat{\theta}_i$ resulting from the standard DEA model (1) is related to the environmental variables w_i through the following equation:

$$\hat{\theta}_i = H(w_i) + \varepsilon_i, \quad \varepsilon_i \leq 0 \tag{2}$$

where $H(w_i)$ is a function that refers to the maximum level of technical efficiency in terms of environmental variables w_i, and $\varepsilon_i \leq 0$ is a normally distributed error term with zero mean that refers to managerial inefficiency. Ray (1991) proposes a two-stage analysis for the estimation of equation (2) where the first stage DEA model is solved using the traditional inputs and outputs and the technical efficiency scores ($\hat{\theta}_i$) from the first stage (i.e. dependent variable) are regressed on the environmental variables (w_i).

A censored Tobit regression model is often considered appropriate for the technical efficiency scores ($\hat{\theta}_i$) as they are bound at both ends of the 0-1 distribution (Jacobs et al. 2006; Tingley and Pascoe 2005; Ray 2004). The equation (2) is rewritten as:

$$\hat{\theta}_i = \gamma_o + \sum_i \gamma_i w_i + \varepsilon_i \tag{3}$$

where γ_i is a vector of parameters to be estimated.

3. Data

Defining health care outcomes is a challenging debate between researchers. For this reason, the inputs and the final outcome are chosen according to the literature.[2,3] Empirical analysis is based on available data published by OECD Health Data Statistics (2016) for a sample of 29 OECD countries (Austria, Canada, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, the Netherlands, New Zealand, Poland, Portugal, Slovakia, Slovenia, Spain, Switzerland, Turkey, the United Kingdom, the USA) and for the periods 1999, 2004, 2009 and 2014.

Table 1 shows the summary statistics of inputs and outputs variables for the periods under examination. As a final outcome we use the life expectancy at birth for the total population, which is one of the most widely used variables measuring the level of population health

TABLE 1 Summary statistics of output and input variables

	Life expectancy, total population at birth	Total health expenditure per capita, PPPs, 100=2010, USD	Total hospital beds per 1,000 population	Total CTS per 1,000,000 population
		1999		
Mean	77.43	2,539.15	6.37	18.84
Minimum	71.20	759.66	3.56	5.08
Maximum	80.50	5,425.54	14.78	84.41
Standard deviation	2.20	1,143.11	2.99	19.26
No. of countries	16	16	16	16
		2004		
Mean	78.18	2,815.54	5.67	20.51
Minimum	72.40	697.93	2.23	6.32
Maximum	82.10	6,924.37	14.20	92.62
Standard deviation	2.70	1,414.69	2.40	18.11
No. of countries	27	27	27	27
		2009		
Mean	79.64	3,234.11	5.15	23.76
Minimum	74.10	862.91	2.40	7.18
Maximum	83.00	7,778.62	13.62	96.97
Standard deviation	2.46	1,448.96	2.44	17.58
No. of countries	29	29	29	29
		2014		
Mean	80.93	3,376.52	5.03	27.13
Minimum	75.90	917.64	2.60	7.88
Maximum	83.70	8,404.43	13.20	107.12
Standard deviation	2.18	1,587.17	2.72	20.14
No. of countries	27	27	27	27

Note: CTS= Computed Tomography Scanners.

2. OECD (2010) stated detailed information about the choice of the appropriate inputs and outputs in the evaluation of the health care systems' efficiency.

3. It should be mentioned that the choice of inputs and outputs might influence the degree of relative efficiency and the ranking of the countries (Jacobs et al., 2006).

(OECD, 2010). Life expectancy at birth has increased over time on average from 77.43 units in 1999 to 80.93 units in 2014 in OECD countries. Japan, Spain, Switzerland and Italy achieved the highest life expectancy level while Hungary, Poland, Estonia and Turkey the lowest. In Greece, the life expectancy level increased from 78.5 units in 1999 to 81.5 units in 2014, taking values above the average level of OECD countries.

Health system resources can be measured in monetary terms or in physical terms (OECD, 2010). In monetary terms, total health expenditure per capita, PPPs, in US dollars (USD),[4] have been used widely in the literature. Hitiris and Posnet (1992) argued that an increase in health expenditure per capita could influence the level of population health. According to the OECD (2016), total health expenditure per capita increased over time from $2,539.15 in 1999 to $3,376.52 in 2014, on average. OECD countries show significant deviations between the minimum and the maximum value. For example, in 2014 the total health expenditure per capita fluctuated between $8,404.43, $5,971.80 and $4,876.80 in the USA, Switzerland and the Netherlands, respectively, while in countries such as Turkey, Poland and Estonia expenditure ranged from $917.64, $1,499.50 and $1,550, respectively. The total health expenditure per capita in our country increased from $1,879.5 in 1999 to $2,995.6 in 2009 and reduced to $2,012.20 in 2014, after the implementation of structural reforms about cost containment of public health expenditures due to the financial crisis, recording values below the average of OECD countries throughout the period under consideration.

In physical terms, the total number of hospital beds per 1,000 population and the number of Computed Tomography Scanners (CTS) per 1,000,000 population[5] have been used as inputs to approximate the infrastructure of health systems. The average density of beds decreased overtime from 6.37 beds per 1,000 population in 1999 to 5.03 in 2014, indicating the decision of hospital managers to switch from in-patient care to one-day care. Greece exhibited values below the average of OECD countries, which ranged between 4.78 beds in 1999 to 4.24 beds in 2014. On the other side, the average density of CTS increased from 18.84 scanners per 1,000,000 population in 1999 to 27.13 in 2014 in OECD countries due to the high technological innovation in clinical treatment. The density of CTS in Greece rose from 25.48 in 2004 to 35.11 in 2014, recording values above the average of OECD countries.

Table 2 shows the summary statistics of environmental variables that might influence the level of population health which are beyond the control of health care systems. Alcohol consumption of adults over 15 years old (litres per capita) (AL), the percentage of the total population over 65 years old (AG), the percentage of the population aged 25-64 years with a tertiary education level (ED) and GDP per capita at constant prices (PPPs, USD) (GDP) are included as environmental variables in the second stage analysis.

Alcohol consumption decreased over time in OECD countries from 10 liters per capita in 1999 to 9.07 in 2014 on average. In 2014, Turkey and Israel recorded the lowest values and Austria and the Czech Republic the highest among our sample countries. Also, alcohol consumption per capita in Greece decreased over time taking values below the average of OECD countries (7.4 units in 2014). The population ageing index increased from 13.96 percent in 1999 to 16.40 in 2014, on average. In 2014, Turkey and Israel exhibited the lowest values while Japan and Germany had the highest values. Greece recorded values above the average of OECD countries, which ranged from 16.9 in 1999 to 20.6 in 2014. The education level also exhibited upward trends. The percentage of adults with tertiary education rose from 24.75 in 1999 to 34.56 in 2014, on average, with Canada occupying first place in 2014. Greece ranked below the average of OECD countries despite the significant improvement between 1999 and 2014 (from 17 to 28 percent). GDP per capita, in current prices, increased over time from $23,654 in 1999 to $38,291.59 in 2014, on average, with Luxembourg and Turkey occupying the top and bottom place, respectively. In Greece, GDP per capita was equal to $25,523 in 2014 (5,000 units lower than 2009) recording much lower values than the average of the OECD countries.

Six dummy variables (HS1 – HS6), accounting for the heterogeneity among countries, are also included in a second stage analysis which classifies our sample countries in six sub-groups sharing broadly similar health system characteristics. Each dummy variable is equal to 1 if the country belongs to the specific sub-group and 0 otherwise. According to OECD (2010) methodology, countries can be classified into six sub-groups according to their health system characteristics. The first group includes countries where private insurance is the basic coverage, such as Germany, the Netherlands, Slovakia, Switzerland and the USA. The second group

4. Data on per capita health care spending include long-term expenditures. While it may have been desirable to exclude this component when estimating the impact of health care, it is quite difficult in practice.

5. The inclusion of health care staff as inputs in our analysis was not possible due to data unavailability.

TABLE 2 Summary statistics of environmental variables

	Alcohol consumption (liters per capita 15+)	Population aged 65+ (% of total population)	Adults aged 25-64 years with tertiary education level (% of total population)	GDP per capita, current prices, PPPs, USD
		1999		
Mean	10.00	13.96	24.75	23,624.00
Minimum	2.00	6.90	9.00	11,059.38
Maximum	14.50	17.80	41.00	34,603.41
Standard deviation	2.94	2.75	9.62	5,699.59
No. of countries	16	16	16	16
		2004		
Mean	10.03	14.83	25.74	28,757.86
Minimum	1.40	11.00	10.00	10,167.91
Maximum	13.60	18.00	45.00	65,407.29
Standard deviation	3.04	2.79	9.99	11,170.95
No. of countries	27	27	27	27
		2009		
Mean	9.46	16.50	30.31	34,584.96
Minimum	1.50	15.00	13.00	14,495.36
Maximum	12.20	18.00	50.00	80,264.56
Standard deviation	2.56	1.29	10.28	12,344.54
No. of countries	29	29	29	29
		2014		
Mean	9.07	16.40	34.56	38,291.59
Minimum	1.50	7.60	17.00	18,599.27
Maximum	12.20	25.10	54.00	93,233.74
Standard deviation	2.60	3.64	9.92	14,401.98
No. of countries	27	27	27	27

Note: GDP=Gross Domestic Product.

includes countries where public insurance is the basic coverage, private insurance is beyond the basic coverage and there is some implementation of gatekeeping, such as Australia, Canada and France. The third group includes countries where public insurance plus a low share of private insurance is the basic coverage with no implementation of gatekeeping, such as Austria, the Czech Republic, Greece, Japan, Korea and Luxembourg. Iceland and Turkey constitute the fourth group which is characterized mostly by public provision and public insurance with no implementation of gatekeeping and ample choice of providers for users. Denmark, Finland, Portugal and Spain constitute the fifth group. Those countries are characterized by public insurance with full implementation of gatekeeping, limited choice of providers for users and soft budget constraints. The sixth group includes countries where public insurance is the basic coverage, gatekeeping is fully implemented, and there is ample choice of providers for users and strict budget constraint, such as Hungary, Ireland, Italy, New Zealand, Poland and the United Kingdom.

4. Empirical results

Table 3 presents the first stage DEA output-oriented technical efficiency[6] scores of health care systems

6. It should be mentioned that DEA technical efficiency measures relative and not absolute efficiency scores, since it measures the efficiency of each individual health system with respect to the best practice frontier that it is observed from the sample.

TABLE 3 DEA output-oriented technical efficiency scores for health care systems in OECD countries

	1999	2004	2009	2014
Australia	0.95	0.62	0.66	0.73
Austria	0.48	0.31	0.37	0.40
Canada	0.99	0.71	0.93	0.98
Czech Republic	0.99	0.54	0.68	0.71
Denmark	0.85	0.60	0.68	0.97
Estonia		0.87	0.74	0.65
Finland	0.65	0.47	0.49	0.61
France	0.75	0.72	0.68	0.61
Germany	0.43	0.28	0.34	0.35
Greece		**0.52**	**0.52**	**0.66**
Hungary	1.00	0.87	1.00	1.00
Iceland		0.60	0.67	0.86
Ireland		0.61	0.89	1.00
Israel	1.00	1.00	1.00	1.00
Italy	0.79	0.62	0.68	0.84
Japan	0.36	0.30	0.32	0.25
Korea	1.00	0.65	0.52	0.41
Luxembourg		0.38	0.48	0.56
Netherlands	0.76	0.88	0.69	
New Zealand			1.00	0.98
Poland		0.96	0.84	0.77
Portugal		0.67	0.74	
Slovakia		0.65	0.70	0.67
Slovenia		0.71	0.76	0.81
Spain			0.83	0.93
Switzerland		0.44	0.49	0.60
Turkey		1.00	1.00	1.00
United Kingdom	1.00	0.91	1.00	1.00
USA	1.00	0.73	0.76	0.87
Mean	0.81	0.65	0.71	0.75
Minimum	0.36	0.28	0.32	0.25
Maximum	1.00	1.00	1.00	1.00
Standard deviation	0.22	0.21	0.21	0.23
No. of countries	16	27	29	27
Countries with TE=1	Israel United Kingdom Hungary Korea USA	Israel Turkey	Israel United Kingdom Hungary Turkey New Zealand	Israel United Kingdom Hungary Turkey Ireland

Note: TE=Technical Efficiency.

TABLE 4 Relative ranking and peers of each considered country with respect to the degree of DEA output-oriented technical efficiency

Country	Ranking				Peers			
	1999	**2004**	**2009**	**2014**	**1999**	**2004**	**2009**	**2014**
Australia	3	11	12	10	Israel, USA	Turkey	New Zealand, Turkey	Ireland, Turkey
Austria	9	19	16	19	Israel, USA	Turkey	Israel, Turkey, United Kingdom	Hungary, Israel, Turkey
Canada	2	8	2	2	Israel, USA	Turkey	New Zealand, Turkey	Ireland, Turkey, United Kingdom
Czech Republic	2	14	10	11	Hungary, Israel, Korea	Israel, Turkey	Hungary, Israel, Turkey	Hungary, Israel, Turkey
Denmark	4	13	10	3	Israel, USA	Turkey	New Zealand	Ireland, Turkey
Estonia		5	7	14		Israel, Turkey	New Zealand, Turkey	Hungary, Turkey
Finland	8	16	14	15	Hungary, Israel, Korea	Israel, Turkey	Hungary, Israel, Turkey	Ireland, Turkey, United Kingdom
France	7	7	10	15	United Kingdom	Israel	Hungary, Israel, United Kingdom	Hungary, Israel, United Kingdom
Germany	10	21	17	20	Israel, Korea	Turkey	Israel, Turkey, United Kingdom	Israel, Turkey, United Kingdom
Greece		**15**	**13**	**13**		**Turkey**	**New Zealand, Turkey**	**Ireland, Turkey**
Hungary	1	5	1	1		Israel, Turkey		
Iceland		12	3	6		Turkey	New Zealand, Turkey	Ireland, Turkey
Ireland		13	11	1		Israel, Turkey	New Zealand, Turkey	
Israel	1	1	1	1				
Italy	5	11	10	7	Israel, USA	Turkey	New Zealand, Turkey	Ireland, Turkey
Japan	11	20	18	21	Korea	Turkey	Turkey	Turkey
Korea	1	10	13	18		Turkey	Turkey	Turkey
Luxembourg		18	15	17		Turkey	Turkey, United Kingdom	Ireland, Turkey, United Kingdom
Netherlands	6	4	9		Israel, USA	Israel	Turkey, United Kingdom	
New Zealand			1	2				Ireland, Turkey
Poland		2	4	9		Israel, Turkey	Hungary, Turkey	Hungary, Turkey
Portugal		9	7			Turkey	New Zealand, Turkey	
Slovakia		10	8	12		Israel, Turkey	Hungary, Israel, Turkey	Hungary, Israel, Turkey
Slovenia		8	6	8		Israel, Turkey	Hungary, Israel, Turkey	Hungary, Israel, Turkey
Spain			5	4			New Zealand, Turkey	Ireland, Turkey
Switzerland		17	14	16		Turkey	New Zealand, Turkey	Ireland, Turkey
Turkey		1	1	1				
United Kingdom	1	3	1	1		Israel, Turkey		
USA	1	6	6	5		Turkey	New Zealand	Ireland

among sample countries with constant returns to scale (CRS). Table 4 shows the relative ranking of countries based on the degree of technical efficiency and the Decision Making Unit's (DMU) peers[7] of each of the considered countries.

From Table 3 we can observe that eight countries are located on the best practice production frontier, i.e. the degree of technical efficiency is equal to one: Israel (for all years), the United Kingdom and Hungary (for all years except 2004), Turkey (for all years except 1999), Korea and the USA (1999), New Zealand (2009) and Ireland (2014). On the other side, Japan, Germany and Austria are ranked in the lower places among countries for all periods under consideration. More specifically, in Japan the degree of technical efficiency reduced from 0.36 in 1999 to 0.25 in 2014, indicating that the health system could improve the level of life expectancy at birth by 75% in 2014 if total expenditures, hospital beds and CTS are used effectively. The health system of Korea is a peer for the health system of Japan (Table 4). Respectively, Germany and Austria, despite the improvement of the efficiency level relative to 2004, could improve their final outcome by 65% and 60%, respectively, under the optimal usage of their available health resources. Peers for the health system of Germany and Austria are the United Kingdom and the USA.

Concerning Greece, the degree of technical efficiency was found to be equal to 0.52 in 2004 and in 2009 and 0.66 in 2014. This indicates that the final outcome could be improved by 34%, if the technical inefficiency of the health system could be eliminated. Greece shows significant improvement (0.14 units) relative to the other OECD countries during the period of financial crisis. Nevertheless, Greece ranked below the average of OECD countries and in 2014 occupied the 13th place among 27 countries of our sample compared to 15th in 2004 (Table 4, Diagram 1). The health system of Ireland is one of the peers of Greece although these two countries are classified in different subgroups according to their health system characteristics.

Denmark, Canada, the Czech Republic, Finland, Iceland, Italy, Switzerland and the USA are among countries that have improved their level of health system technical efficiency relative to 2004 and 2009. Also, countries, such as Ireland and Spain that have experienced the impact of the financial crisis seem to have reduced the inefficiency of their health systems in 2014 by 0.11 and 0.10 units relative to 2009, ranking in the 1st and 4th place, respectively (Diagram 1).

The degree of technical efficiency increased from 0.65 in 2004 to 0.75 in 2014, on average, among our sample OECD countries, indicating that the specific final outcome could be improved by 25% under the optimal use of inputs. Diagram 2 shows the frequency distribution of technical efficiency among countries. We can observe that 44% of the countries in 2004 and 41% in 2009 exhibited technical efficiency levels between 0.60 and 0.80. In 2014 a shift toward a higher frequency interval is observed. Sixty percent of countries were found to have technical efficiency levels between 0.60 and 1.00 equally. Therefore, in 2014 a greater portion of countries exhibited higher levels of technical efficiency than in 2009 and 2004 while at the same time a significant increase in the level of technical efficiency was not observed.

Table 5 shows the estimated parameters of environmental variables derived from the second-stage censored Tobit analysis. We can observe that the degree of technical efficiency in health systems is closely related to the population ageing index (AG) and the institutional characteristics of health systems (HS1 and HS3).

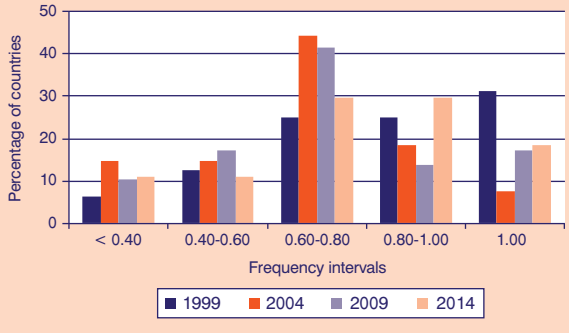
The estimated parameter of the percentage of population aged over 65 years is statistically significant at a 5% significance level and negatively related to technical efficiency scores for all periods under consideration. This indicates that an increase in population aged over 65 years could reduce the degree of technical efficiency, implying that the relevant country moves further from the theoretical production possibility frontier. Therefore, the lower the population ageing index, the higher the technical efficiency score of health provision in a given country.

The estimated parameter of the dummy variable refers to the first sub-group of OECD countries (HS1), where private insurance is basic coverage, is statistically significant and negatively related to the efficiency score for all periods except 1999. This group includes countries, such as Germany, the Netherlands, Slovakia, Switzerland and the USA, of which the health systems seem to operate less efficiently than the reference subgroup countries (HS6). The reference subgroup includes countries, such as Hungary, Ireland, Italy and the United Kingdom, where the health systems are based mainly on public insurance, full implementation

7. The optimal solution of a non-parametric DEA method can include what are termed "peers" for each country which can serve as a benchmark for the countries that are not located on the frontier, i.e. inefficient health systems. Peer countries exhibited a technical efficiency score equal to one.

DIAGRAM 1
Relative ranking of OECD countries with respect to the degree of technical efficiency

DIAGRAM 2
Frequency distribution of health care systems' technical efficiency scores in OECD countries



of gatekeeping and the compilation of strict health budget constraints. The countries that are classified in the third subgroup (HS3), such as Austria, the Czech Republic, Greece, Japan, Korea and Luxembourg, where their health systems are characterized by public insurance with a low share of private insurance and no implementation of gatekeeping, seem to operate less efficiently than Hungary, Ireland, Italy and United Kingdom.

The remaining estimated parameters for environmental variables which refer to alcohol consumption, the level of education and GDP per capita were found to be statistically insignificant and negatively related to the efficiency scores.

TABLE 5 Tobit model results for the estimated values $\hat{\theta}_i$ of DEA technical efficiency with respect to environmental variables

	1999	2004	2009	2014
Constant	1.965*	1.489*	1.486*	1.498*
	(3.061)	(6.101)	(7.070)	(4.237)
AL	0.008	-0.016	-0.008	-0.015
	(0.199)	(-1.051)	(-0.573)	(-0.838)
AG	-0.072*	-0.026*	-0.030*	-0.026*
	(-2.094)	(-2.408)	(-3.695)	(-2.086)
ED	-0.007	-0.001	-0.001	-0.003
	(-0.570)	(-0.316)	(-0.517)	(-0.569)
GDP	0.001	-0.001	-0.001	0.001
	(0.339)	(-1.242)	(-0.761)	(0.446)
HS1	-0.290	-0.195*	-0.240*	-0.265*
	(-1.099)	(-2.298)	(-3.336)	(-2.479)
HS2	-0.098	-0.055	-0.020	-0.042
	(-0.344)	(-0.470)	(-0.200)	(-0.290)
HS3	-0.377	-0.320*	-0.327*	-0.352*
	(-1.899)	(-3.876)	(-4.724)	(-3.652)
HS4		-0.270	-0.261*	-0.204
		(-1.678)	(-2.013)	(-1.101)
HS5	-0.177	-0.164	-0.121	0.016
	(-0.714)	(-1.683)	(-1.616)	(0.135)
Sigma	0.203	0.140	0.118	0.162
	(3.903)	(6.320)	(6.328)	(6.026)
Log Likelihood	0.541	15.804	13.598	6.679

Note: AL – Alcohol consumption, AG – Population over 65 years, ED – Adults 25-64 years old who have attained a tertiary education level, GDP – GDP per capita, HS1-HS5 dummy variables characterized the heterogeneity of health care systems, sigma – estimated standard deviation of error term. T-statistics in parenthesis.

* Statistical significant at 5% significance level.

5. Concluding remarks

The article evaluates the degree of technical efficiency for a sample of OECD countries using as the final outcome the life expectancy at birth for the total population, as inputs the total health expenditure per capita, the number of hospital beds and the number of CTS, and as environmental variables the alcohol consumption, the percentage of the population aged over 65 years, the percentage of the population with tertiary education, GDP per capita and the institutional characteristics of health systems.

The empirical results of standard first stage DEA linear programming indicate that the countries' health systems have significant room for improvement in accordance with other empirical studies in the literature. On average, the OECD countries could improve the level of life expectancy at birth by 25%, using the same quantities of inputs. Countries, such as Greece, that are experiencing the impact of a financial crisis seem to have eliminated the inefficient usage of health resources in recent years. Taking into account that the technical efficiency measures relative and not absolute terms, the level of technical efficiency and the consequent ranking of countries influenced by the choice of outputs and inputs, we could argue that the study's empirical results constitute evidence that Greece is one of the OECD countries that has achieved improvement in the final outcome relative to the other sample countries in

2009. However, there is still room for improvement in the operation of the health system and the elimination of weaknesses in Greece.

The fact that a country might be located away from the best practice production frontier does not necessarily result from the inefficient production of health care services, but might also be due to environmental factors which are beyond the control of health systems. The two-stage analysis showed that the ageing of the population could be a significant exogenous factor that influenced negatively the efficient operation of the health system. Empirical studies supported that the alcohol consumption, the level of education and the economic profile could also influence significantly the level of efficiency of health systems but this is not verified in our sample of OECD countries.

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Refugee and immigrant flows and their expected consequences on the Greek labour market

*Ioannis Cholezas**

1. Introduction

Greece has become the recipient of large flows of refugees-immigrants[1] originating from Asia and Africa for the past year or so. It is estimated that in 2016 approximately 165,019 refugees and immigrants arrived on the Greek islands (UNHCR, 2016a). In its recent report for the first quarter of 2016, FRONTEX estimates that 49.1% of refugees entering Europe through the route of the east Mediterranean Sea[2] come from Syria, 25.2% from Afghanistan and 16% from Iran (FRONTEX, 2016). Compared to last year's flows, the share of Syrian refugees has declined by almost 10 percentage points (pp), but the number of refugees from Iraq has almost quadrupled (from 4.5%). A general decrease in the number of refugees is reported in United Nations (UN) data.[3] From January 2016 until the 23rd of August, it is estimated that 162,604 refugees and immigrants arrived in Greece.[4] Therefore, refugee flows decreased by approximately 16% compared to the respective period in 2015. The decrease is particularly evident since the EU and Turkey signed an agreement last March for the control of refugee flows.[5] However, a closer look at the fluctuation of refugee flows over time reveals that they peaked at the end of 2015. The maximum number is reported in October when it is estimated that 211,633 refugees arrived. Thus, refugee flows in 2016 are considerably lower, although some concerns are expressed lately,[6] mainly due to the small increase in refugee arrivals in July and August.[7]

The reasons forcing those people to migrate are predominantly humanistic, since the political situation in the countries of origin is unstable, while in some of those countries there are civil wars on. For example, it is estimated that in the first quarter of 2016, 274,474 asylum applications were submitted to EU member states, compared to 405,413 applications in the fourth quarter of 2015 (34% reduction) and 181,569 applications a year ago (51% increase) (FRAN, 2016Q1). Thirty-seven percent of those asylum applications were submitted by Syrians, 13% by Iraqis and 12% by citizens of Afghanistan.

It is important to note that the majority of both refugees and immigrants treat Greece as a stop on their way to northern European countries, such as Austria, Germany, Denmark, Sweden, etc.[8] The unfavourable economic conditions is certainly one reason for that. For the time being, the agreement with the EU refers to the hosting of 50,000 refugees, which may have only a temporary character though.[9] Greece has accepted the responsibility to provide accommodation for 30,000. The remaining 20,000 are under the auspices of the UN. This number includes 9,000 posts for those who have applied for asylum and whose applications will be accepted. However, given the circumstances that shape in the rest of Europe, i.e. many countries seem reluctant and hesitant to accept more refugees, especially after the terrorist attacks in France and Belgium, and the refusal to accept quotas proposed by the European Commission for the allocation of refugees across countries (note that some countries, like

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1. The largest share of immigrants originates from countries at war, therefore the reasons for migrating are humanitarian and hence the use of the term refugees is more suitable. In the text the two terms are often used interchangeably.

2. That involves mainly the Greek islands Chios, Lesvos and Samos.

3. See http://data.unhcr.org/mediterranean/country.php?id=83.

4. During the first eight months of the year refugees and immigrants arrived in Greece from Turkey and by sea as follows: 93,446 in Lesvos, 38,137 in Chios, 11,953 in Samos, 8,634 in Leros, 4,655 in Kos and 3,616 in Kastellorizon (UNHCR, Greece data snapshot 23 August 2016, available at http://data.unhcr.org/mediterranean/country.php?id=83).

5. The main points of the agreement are described in: http://www.ethnos.gr/politiki/arthro/symfonia_8_simeion_ee_tourkias-64348647/.

6. See http://news247.gr/eidiseis/koinonia/ayksanontai-ksana-oi-prosfygikes-roes-xiliades-paramenoyn-sta-nhsia.4235041.html and http://www.naftemporiki.gr/story/1142280/kampanaki-enpe-gia-tis-auksimenes-prosfugikes-roes.

7. Refugees and immigrants increased from 1,554 in June to 1,920 in July and 2,307 in August.

8. See http://www.avgi.gr/article/6197031/g-mouzalas-i-ellada-einai-xora-tranzit-gia-tous-prosfuges.

9. In October 2015 there was an agreement between Greece and the EU to accommodate 50,000 refugees. The agreement included providing shelter to 30,000 refugees and subsidising rent for another 20,000 refugees. (http://www.kathimerini.gr/836316/article/epikairothta/politikh/50000-prosfyges-8a-meinoyn-sthn-ellada).

Hungary, have already closed their borders and refuse to accept any more refugees), it is almost certain that many of those refugees already in Greece will stay here longer than expected.[10] Therefore, exploring the potential of hosting a much larger number of refugees than planned[11] and prospects to smoothly integrate them into the Greek society and economy seem rather justified in the present context.

The expected economic consequences of a large inflow of refugees in Greece are both direct and indirect. Direct consequences include high fiscal costs related to track and rescue operations, the construction and operation of camps and hotspots, the clothing and feeding of refugees, the education of the children, healthcare, etc. Indirect economic consequences include the reduction in tourist arrivals in regions that face high inflows of refugees, like the Aegean islands, the potential increase in rents, etc.[12] Refugee flows may also have positive effects though. Those are linked to the inflow of capital from the EU to handle the refugee crisis that could lead to increased demand for goods and services domestically produced due to the increase in population, especially in regions where refugee presence is stronger. Under certain conditions, refugee flows could have additional positive effects on real estate. However, the net effect is difficult to determine for the time being.[13]

This article focuses on a field which is expected to be dominated by negative consequences for actors, both natives and foreigners, at least for the time being, i.e. the labour market. In this context, it attempts to determine the factors likely to contribute to these negative prospects and the risks associated, as well as to recommend actions to contain them.

2. Factors causing negative prospects for the integration of refugees in the labour market

There are two groups of factors that may get in the way of a smooth integration of refugees into the Greek society, at least those who will stay in the country in the end, and, thus, increase the management cost. The first one involves the bad situation of the Greek economy due to the crisis going on for the past eight years and, consequently, the bad shape of the labour market. In other words, the first type is linked to labour demand. The second group of factors involves the characteristics of contemporary refugees, which determine how easy it will be to integrate them into the Greek labour market and it is, thus, linked to labour supply.

2.1. The labour market

The success of the refugees' integration process depends upon the receiving environment. Moreover, the prospects of refugees in the labour market determine largely the success of the processes of economic and, consequently, of social integration. At the moment, approximately one quarter of the labour force over 15 years of age is looking for a job, with no luck. But things were not always that bad. Up to 2008, before the economic crisis, the labour market did quite well, despite concerns about the negative consequences in employment that the end of the Olympic Games in Athens could have had. The unemployment rate fluctuated around 10% from 2001 to 2003. Starting in 2004, unemployment fell gradually and reached 7.3% by the end of 2008. From 2009 the unemployment rate increased rapidly until the end of 2011, when the pace slowed down. It stabilised in 2013 and since 2014, when it assumed its biggest value (27.8%), it has begun to show signs of de-escalation.

The de-escalation of the unemployment rate registered over the last couple of years could ease the integration of refugees, as long as it is fast enough. However, a close look at the data reveals that this is not the case. On the contrary, the de-escalation is rather slow and the unemployment rate continues to be unacceptably high (close to 25%). As a result, Greece faces the highest unemployment rate amongst the 28 European Union member-states (EU28). At the bottom of the distribution rank countries like Germany, Austria and Sweden, with unemployment rates close to 5%. Undoubtedly, low unemployment rates are an additional reason, among other attractive attributes these countries possess,[14] why these countries seem to be a top destination among refugees, unlike Greece.

10. The fact that even in the past Greece was not the ideal destination country, but more like a feasible choice, should not be disregarded (Cavounidis, 2004).

11. It suffices to recall discussions over the matter at the beginning of 2016. According to statements from the deputy minister of immigration policy, the issue of hosting 300 to 400 thousand refugees was debated. (See http://news.in.gr/greece/article/?aid=1500054178).

12. Cost and benefit redistribution between regions could smooth the negative impact of the refugees considerably.

13. A noteworthy effort to determine the cost of the refugee crisis for Greece can be found in Ministry of Finance (2016).

14. The reception environment is very important, for example. Pictures and footage of the warm welcome of 20,000 refugees in Germany in September 2015 made the country synonymous with the Promised Land.

Even if the situation is very difficult across the country, things may be better in specific local labour markets (in our case administrative regions) and may justify a certain degree of optimism. Besides, it is a fact that unemployment has stopped increasing in most regions. However, the number of the unemployed, natives and foreigners, continues to be very big, despite the fact that some regions have managed to contain unemployment lately. Those regions that seem to perform better with respect to unemployment rely heavily on tourism, a fact which may dissimulate risk, especially if the industry continues to be affected by recent refugee flows from Turkey.[15] In addition, a decrease in unemployment does not necessarily mean an increase in employment. For example, at the country level over the past year (2015-2016, Q1) more than 100,000 jobs were created, most of which were in Attica (41.3%) and Central Macedonia (32.6%).[16] However, the unemployment rate dropped only marginally. Considering the number of the unemployed and the creation of new jobs over the past year, it is estimated that it will take more than seven years to get back to the 2008 level of unemployment. That is, given that the labour supply is fixed, which is *a priori* impossible considering the inflows of refugees that will start looking for a job.

High unemployment rates can go hand in hand with labour market vacancies due to a mismatch between labour demand and supply. These vacancies could be filled by refugees with skills and competencies different from those of the natives. According to the most recent data published by ELSTAT,[17] in the first quarter of 2016 there were 15.4 thousand vacancies, approximately five times more than the last quarter of 2015 and 2.1% less compared to the first quarter of the same year. Due to employment's seasonality, the reduction in the number of vacancies on an annual basis is positive, even if small. Therefore, the only thing that seems to imply the existence of a mismatch between labour demand and supply is the increase in vacancies on an annual basis in 2013-2014, for most quarters. However, 2015 is characterised by an important reduction in vacancies.

Underemployment, i.e. working less hours or days per week than desirable, is another phenomenon that needs to be examined,[18] because it reflects an imbalance between labour demand and supply,[19] therefore its aggravation through the integration of refugees might prove damaging. According to the Labour Force Survey (LFS), in the first quarter of 2016, ELSTAT[20] estimates that the number of the underemployed reached 7.3% of total employed, which is more than three times higher compared to 2008 and more than one percentage point higher compared to the first quarter of 2015. Therefore, problems in finding a job are not restricted to the inadequate demand for labour in terms of the number of workers required, but they also involve the type of jobs available by firms (fewer hours), especially when these types of jobs cannot ensure a decent way of life.

Integrating refugees into the Greek labour market might be an easier task if the unemployment rate for immigrants already in the country was lower than that for natives. That is simply not true, though, at least for the past few years, since before the crisis immigrants had equal or better chances of getting a job than natives. According to Eurostat,[21] in the first quarter of 2008 the unemployment rate for foreigners was one percentage point lower than that for natives. Since the beginning of the crisis, though, the tables have turned and the unemployment rate for foreigners increased considerably and surpassed that for natives. Therefore, in the first quarter of 2016 the unemployment rate for foreigners was 34.1% vs. 26% for natives. The higher unemployment rate for foreigners is a strong signal that the Greek economy cannot create new jobs, not even for the part of the labour force that is considered more flexible and is often forced to accept low paying or/and informal jobs.[22]

15. The increase in paid employment by region discussed next makes clear that regions that rely on tourism do better.

16. Taking into account the number of the employed individuals, it turns out that the Ionian Islands and South Aegean, i.e. both regions that rely heavily on tourism, saw their employed individuals over the past year increase disproportionately more, by 20.1% and 16.7%, respectively.

17. See the related bulletin in http://www.statistics.gr/el/statistics/-/publication/SJO41/-.

18. Part-time employed individuals who would prefer working full-time are included.

19. Supply for working hours exceeds demand, i.e. people are willing to work more hours per week.

20. Series "Timeseries", Table 10, in http://www.statistics.gr/el/statistics/-/publication/SJO01/-.

21. See http://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do.

22. It should be noted that LFS, the main source of information for Eurostat, rely on questionnaires that are treated with the utmost confidentiality. That means that there is no danger of being tracked down and, therefore, interviewees have no reason to lie about whether they are employed or not, even if they are uninsured.

Going over LFS data, it turns out that industries that gave work to immigrants in the past, therefore they could do it again in the future for contemporary immigrants and refugees, i.e. agriculture, households, construction and tourism, are struggling to cope with the adverse economic environment. Tourism is the only one that seems to present positive prospects. Agriculture, which still is a big employer for foreigners, is shrinking in terms of the number of employed individuals. According to ELSTAT, from the first quarter of 2008 until 2016 approximately 71 thousand jobs were lost in agriculture, 252 thousand in construction and 30 thousand in households.[23] Note that in agriculture and households, employment continued to shrink during the past year. On the contrary, tourism (i.e. Accommodation and food service activities) is the only industry, of those still employing a large number of immigrants, which increased available jobs during the crisis (+8.6 thousand), while it created close to 26.5 thousand new jobs over the past year. It goes without saying that as long as the big industries in terms of employment are not adequately supported, employment prospects, not just for refugees but for natives alike, are not good.

In conclusion, the Greek labour market is in a bad shape that allows no optimism regarding its ability to absorb additional inflows into the labour force, even if they concern more flexible human resources than natives. Additional inflows, no matter how big or small they are, are most probably going to increase the pool of unemployed, while at the same time they will probably aggravate informal activity and expand the shadow economy. Both the increase in unemployment and the expansion of the shadow economy could reinforce social unrest and operate in the opposite direction than the desirable one. Therefore, emphasis should be put on reinvigorating economic activity and creating new sustainable jobs. No doubt, the right to exercise independent fiscal, monetary and exchange rate policies could provide the Greek government with the necessary flexibility and tools to adjust smoothly to an external shock, like the one caused by the refugee crisis.

2.2. The characteristics of contemporary refugee flows

The characteristics of contemporary refugees differ from those of the immigrants of the past and that is definitely another point of concern. For starters, the composition of migrant flows is different. In the past, most immigrants were men (54.5%), although it was not uncommon for immigrants coming from specific countries to be primarily women.[24] Moreover, 80% of immigrants between 15 and 64 years of age came from neighbouring countries, e.g. 57.5% came from Albania.[25] The main reason for migrating was finding a job, more often for men (58.9%),[26] and the second most common reason was family reunification (Cholezas and Tsakloglou, 2009).

Contemporary refugee flows are distinctively different. The main reasons for migrating, especially from countries like Syria, Afghanistan and Iraq –the countries of origin for the majority of refugees– are humanitarian. These countries face civil wars and an unstable political situation. It is no accident that a large number of those immigrants apply for asylum. Moreover, the countries of origin are geographically remote, a fact that makes the development of a close relationship between the country of arrival and the countries of origin difficult to establish, despite major advances in information and communication technologies. In addition, many immigrants are children. In June 2015 approximately 16% of immigrants were children, while in February the respective share was 40% (Ministry of Finance, 2016). According to more recent data by the UN, in July 2016 children represented 20% of arrivals (UNHCR, 2016b). Note that many of them are unaccompanied. This reality changes necessary interventions drastically, since children cannot work, thus they must be supported more actively and effectively and for a longer period of time compared to adults.

Regarding refugees that can work, the data seem to indicate that many are highly skilled[27] and, indeed, much better skilled compared to immigrants of the past.[28] OECD reports that approximately one third of Syrians

23. Many immigrants and refugees could possibly be employed in Manufacturing as unskilled workers. The only problem is that Manufacturing was severely harmed by the crisis and lost approximately 208 thousand jobs, although it seems to be doing better over the past year.

24. According to the 2001 census, the majority immigrants from Ukraine (75.5%), Moldova (77.4%) and the Philippines (76.4%) were women.

25. Geographic proximity shapes the pattern of migration, affects the duration of stay and the frequency of travelling to the country of origin (Cavounidis, 2002).

26. Kontis et al. (2006) raise that number to 82.5%.

27. See http://www.ibtimes.com/europe-refugee-crisis-facts-wealthy-educated-syrians-risking-lives-leave-war-2089018.

28. According to the 2001 census, approximately 10% of immigrants had a tertiary education degree, while about half had completed secondary education, including vocational education (Cholezas and Tsakloglou, 2009).

have a tertiary education degree (OECD, 2014). Moreover, according the UN High Commissioner for Refugees, 79% of Syrians graduated secondary education or university. The respective share for Afghanistan nationals is 44%.[29] The high level of skills embodied by refugees can have two main consequences. The first one is that contemporary refugees might not be willing to accept unskilled jobs, since they are people with ambitions arising from the skills and competencies they possess. The second consequence is that contemporary refugees are not at all likely to be employed in the same industries that immigrants were employed in the past, since those industries relied on demand for unskilled personnel[30] and the refusal of natives to accept jobs offered.

Immigrants that arrived in the past were employed in jobs that natives usually rejected. In a thriving economy natives had the opportunity to look for jobs that offered better working conditions, higher pay and better career prospects. That made immigrants complements to natives and flattened tensions between them. Construction is a typical example. Competition between immigrants and natives was resolved through the occupational advancement of the latter who often became contractors and/or organised their own teams of building workers and employed immigrants. The result was to improve working conditions and compensation for the natives. A similar experience is recorded all over Europe (Beerli and Peri, 2015). The question we need to answer then is whether we can expect something similar happening again in a labour market that suffers from high unemployment rates and continuous expansion of flexible types of employment.

3. Possible negative impacts from refugee flows

The number of refugees that will stay in Greece is not yet clear, neither is the duration of their stay. In any case, the country should be prepared for the worst case scenario based on available means and given the extremely difficult fiscal situation it faces. However, under present circumstances, dominated by a labour market that is suffocating and an unemployment rate close to 25%, prospects are not positive for refugees. This fact is probably going to have a negative impact on the labour market and beyond, which should first be detected and then dealt with.

A first possible negative consequence could be competition amongst natives and refugees applying for the same jobs. Competition could be severe, especially for unskilled jobs, where insufficient knowledge of the Greek language poses a less important obstacle and given that the economic crisis that has forcefully impacted households and drives them to despair. But, unskilled jobs might not be the only field of confrontation. The highest level of education and training attained by refugees compared to the flows of immigrants in the past could allow them to apply for jobs with requirements closer to those of natives. For that same reason refugees will probably be less willing to accept unskilled jobs, like immigrants in the past used to do, which allowed their human capital to depreciate.[31] There is a positive aspect to this, since human capital depreciation is a bad outcome for both foreigners and the reception country that cannot utilise them properly. On the other hand, it bears the risk of refugees operating as substitutes for natives and causing the latter to react, especially if demand for labour remains weak.

Immigrants of the past sought jobs, but not contemporary ones. That means that the former were willing to accept a job even if it did not match their skills and competences and did not live up to their expectations, because the primary target was to integrate into the Greek society and stay. In contrast, the majority of refugees that arrive in Greece today do not wish to stay in the country. Their aim is to leave as soon as possible, in order to continue their journey towards north European countries. Although developments in the political field could endanger the original planning (recall closed borders in Balkan countries and elsewhere that block refugees from travelling north), it is expected that several months will go by before refugees decide to change these plans, either by returning to their home country or by choosing non-European countries as their destination or even by staying in Greece.[32]

29. See http://www.unhcr.gr/nea/artikel/5c90270ec0223c11a8156b27bb1e4ae0/ereyna-ya-oi-afgan.html.

30. Note that in the 2001 census, 37% of employed foreigners were enlisted as unskilled workers, handcrafters and micro-professionals, while 77% of immigrant women were employed in private households (Cavounidis, 2004).

31. Interestingly, over-education, i.e. being employed in a job that requires a lower level of education than the one embodied by the individual actually holding that job, occurs twice as often for immigrants compared to natives (66% vs. 37%) (Lianos, 2007).

32. According to the Dublin regulation, the country of arrival is the one that ought to process asylum applications. A stricter enforcement of that regulation, as demanded lately, means that refugees will have to stay in Greece for a long time (See http://news.in.gr/greece/article/?aid=1500099248).

This could mean that the total number of refugees that Greece initially agreed to accommodate will increase considerably and without a clear time horizon.

The arrival of refugees will increase the supply of labour, even if their stay in the country is only temporary, e.g. before their asylum applications are processed, and it is expected to put downward pressure on wages and compensation from labour in general (Borjas, 1995). Further reductions in wages resulting from the competition between foreigners and natives, assuming that labour demand will stay constant,[33] might cause natives to react. Such phenomena of pressure on wages, especially for the unskilled employed, have been recorded in the UK (Dustmann, Frattini and Preston, 2013), the Netherlands (Beerli and Peri, 2015) and Spain (Farré, González and Ortage, 2011). Moreover, there could be negative consequences on employment and wages for immigrants already in the country, since such a case has been reported in the UK (Manacorda, Manning and Wadsworth, 2012).

The increase in labour supply caused by refugees could lead to the redistribution of resources towards employing labour-intensive technologies, since there is an ample and cheap labour force. There is an immediate risk for the country to follow the opposite pattern compared to countries that benefited from the arrival of highly skilled immigrants, adopted new technologies, improved their competitiveness and grew.[34] In other words, it is possible to repeat the process of biased growth that was recorded before the Olympic Games of Athens, which relied heavily on the immigrant cheap labour force (Cholezas and Tsakloglou, 2009). Especially under the present circumstances, when efforts take place to restructure the production process in order to adopt new production models and increase competitiveness, something of the kind would constitute a particularly disappointing development, which could spread beyond the narrow bounds of the labour market and affect the entire economy.

Due to the fact that part of the labour force looking for a job is short-sighted (i.e. it does not care about the future, since the primary objective is to leave the country as soon as possible), and given the context (i.e. an economy with a negative growth rate and a very limited production of new jobs), it is considered highly probable to witness an increase in undeclared and unsecured work (Del Carpio and Wagner, 2015). Such a development would be bad in its own right for the Greek economy and society, since it will deprive the state of benefits related to social security contributions, taxes, competitiveness (a drop in capital investments due to cheap labour availability), etc., which are so much more important today. Moreover, it would deprive natives jobs and it could slow down or even cancel out attempts that started during the past few years to contain the shadow economy and seem to have encouraging results.

Last but not least, high unemployment rates, apart from making it even more difficult for refugees to integrate into the Greek labour market and increase their chances to stay in the country, may have long-term negative consequences for their career prospects. It has been reported that immigrants arriving in a country in periods of high unemployment need more time to converge to the patterns of employment and the level of wages of natives (Äslund and Rooth, 2007). Moreover, the literature seems to suggest that the substitution of unskilled or low skilled immigrants for natives is more intense at times of economic distress, similar to the situation the Greek economy is currently facing (Devlin et al. 2014; Peri, 2010). Thus, negative effects from the refugee flows are more likely to be realised exactly because of the bad shape of the Greek economy. Probably, the larger the flows, the more intense the consequences will be.

4. Intervention to contain negative consequences on the labour market

The negative consequences discussed above can be mitigated, if there are suitable preparations and actions. The integration of refugees into the labour market, at least those who will stay in the country, is not a simple task. This is proven from the experience with immigrants in the past. First and foremost, refugees should be given the right to work legally, i.e. a work permit, even before the asylum application processing ends.[35] Next, in order to facilitate the integration of refugees into the labour market, one has to have information on their characteristics, especially those used by potential employers to choose their employees. That means that

33. This hypothesis might be inaccurate as long as refugees' needs create demand for goods and services, thus demand for employment (IMF, 2016). The crucial issue is whether that additional demand is met by domestic production or imports.

34. The case of Israel is typical: the high-tech industry benefited a lot by the inflow of highly skilled Russian refugees from the former USSR (IMF, 2016).

35. This requirement is necessary so long as we wish refugees to integrate into the labour market and be able to stop relying on state support and NGOs for their survival.

the processes of collecting and recording information about refugees in the country should be accelerated, at least for those who intend to stay, including those applying for asylum.[36] Anyway, key personal characteristics that will facilitate refugees in finding a job should be recorded, such as the level of education attained, the field of studies, the competencies and skills possessed, either certified or not, previous work experience, occupation exercised in the home country, etc.

At the same time, the needs of the labour market should be defined as a means to improve matching between labour demand and supply. The effort to design and implement a mechanism for the diagnosis of labour market needs that started last year could serve that purpose.[37] Once, on the one hand, the characteristics of the labour demand are known, practically the skills and competencies demanded by employers in order to hire someone, and, on the other hand, the characteristics of those looking for a job, both refugees and natives, that represent labour supply are also known, then these pieces of information can be combined to improve the matching of labour demand and supply and increase efficiency.

The smooth integration of refugees into the Greek labour market relies on two requirements. The first one is to learn the Greek language, since most refugees do not speak Greek. This is a serious obstacle in finding a job in services and often it is a serious obstacle for finding any kind of job. Lack of adequate knowledge of the receiving country's language is probably one of the main reasons immigrants in the past concentrated on unskilled jobs. Therefore, to overcome that obstacle, refugees need to be given the chance to participate in intensive Greek language courses and earn certification in the end. There are such provisions for children (support classes, Greek language courses in schools), but the situation is less clear as far as adults are concerned. The Ministry of Education, Research and Religious Affairs recently announced the hires of temporary teachers who will be employed in hotspots (refugee accommodation centres) to teach the Greek language to approximately 18,000 refugee children.[38] This is certainly a step in the right direction, but it might be useful to expand courses to include not just the teaching of the language, but to provide refugees with basic knowledge about the Greek way of life.

The second requirement is the certification of refugees' occupational skills and competencies, regardless of whether they acquired them within the official education system or not. This is important for both immigrants and refugees, since they would be able to prove their skills and apply for matching jobs. It is also important for employers who would be protected against false claims and it would shorten the time needed to hire and, thus, reduce the associated cost. Moreover, refugees would become directly comparable to natives and would be able to apply for jobs on equal terms. This is also a way to spread potential effects from increased labour supply to the entire distribution of jobs based on skills and wages and avoid extreme impact at the bottom of the distribution, as is typically the case.

The requirements discussed above entail state actions and they, in turn, demand funding. In any case, it should be clear that under present circumstances the Greek economy has very limited leeway to absorb additional labour force, given the high unemployment rates and fiscal problems the country faces. Even if the argument in favour of vacancies in the labour market is valid, they seem to be very few and usually involve high skilled jobs. That last part means that it is highly improbable to fill these vacancies from the refugee pool, but not impossible.

Therefore, creating new jobs seems like the best solution that could be combined with industries and priority sectors traced by the EU in the context of the Strategy for Research and Innovation for Smart Specialisation (RIS3).[39] The industries that seem to have a competitive advantage at the regional level in Greece and, thus, available funds ought to be directed towards them in order to accomplish the maximum growth effect are the following: 1. Agri-nutrition, 2. Health-Medicines, 3. Information and communication technology, 4. Energy, 5. Environment and sustainable growth, 6. Transport and supply chain, 7. Materials-construction, 8. Tourism-civilisation-creative industries. At the national level, agri-nutrition and tourism are characterised as priority industries for all regions, while the industry for information and communication technology is also considered important. New jobs will be able to offset competition for the same jobs between refugees and natives.

36. These characteristics should not be used to select refugees who will be given a stay permit. The same thing for immigrants within the context of a targeted migration policy to allow for their faster integration in the labour market should not be rejected without prior discussions.

37. Information on the mechanism for the diagnosis of labour market needs can be retrieved from: http://www.eiead.gr/index.php?option=com_content&view=article&id=342&Itemid=222.

38. See http://www.iefimerida.gr/news/285240/mpainoyn-sta-sholeia-18000-prosfygopoyla-proslipseis-ekpaideytikon.

39. See https://www.espa.gr/el/pages/staticRIS3.aspx.

The question is how easy it is to create new jobs in a short period of time.[40] There are well known ways to speed up the creation of new jobs, but they are certainly not easy to implement. The attraction of Foreign Direct Investments (FDI) is one way, although there is always the risk of the aftermath, when these FDI will stop or retreat from the country. Active labour market policies, like those already in effect, could also help, especially when combined with serving immigrants' needs. Selective funding of more public works could also create jobs, although caution should be exercised to contain collateral effects. Funding new businesses, through the Law for Development or ESPA, could be another way to go. A last option is to create jobs in the public sector directly, but this is especially tricky since it is an option tried in the past and failed, on top of the fact that state expenses are contracting and are not expected to expand in the near future. The remaining choices are open though. However, they are not necessarily acceptable to our EU partners, at least not all of them, since they require funding, which is unlikely to come from national resources.

5. Conclusions and policy recommendations

Two main sources of concern arise from the above short analysis, given the uncertainty regarding both the total number of refugees Greece will be forced to accommodate and the duration of their stay. The first source of concern is the bad shape of the economy and the labour market, which seems highly unlikely to be able to absorb, in the short-run, additional inflows into the labour force because of refugees, at least not without serious adverse effects on labour market key variables, such as unemployment, undeclared and unsecured work, and wages. The second source of concern is the different characteristics of refugees compared to the immigrants of the past, which increases the possibility that they will operate as substitutes and not complements for natives on top of their willingness to leave the country as soon as possible.

There are multiple risks associated with the above mentioned sources of concern that cannot be contained in the labour market alone. In a country that has been struggling under the burden of the economic crisis for the past eight years, refugee flows could heighten social tensions and cause wider political destabilisation, so long as the management of the refugee flows fails to: a) prevent the set up of ghettos, b) keep refugees' motives to look for a job, even a temporary one, intact, c) prevent negative consequences in the tourist industry, the natives' employment and the immigrants' employment already in the country, possibly through the redistribution of costs and benefits between regions, d) find alternative ways to finance actions, in order to avoid further cuts in public spending, which is already much smaller compared to the past.

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40. There is always the alternative of waiting for the Greek economy to grow by itself and create new jobs in the process. The thing is that apart from uncertainty regarding the number of jobs that will be created, given the substitution of labour for capital due to technological advancements and the never-ending need to reduce the production cost further, built in to every open economy, there is also uncertainty regarding the time needed to create the required number of jobs.

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Greece and Germany: Policy and efficiency of tobacco taxation

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1. Introduction

The prolonged economic recession in Greece led the government to create innovative tax policies to generate revenues at apparently any price in order to achieve the front-loaded fiscal consolidation targets. This is particularly true in the case of tobacco taxation. The necessity of raising public revenues in Greece resulted in an overtaxation of tobacco products, especially for manufactured cigarettes. However, Greek smokers where not only confronted with a steady rise in taxes, but also with a significant change in tax structure. This article discusses the Greek tobacco taxation strategy and its effects on consumer behavior and tax revenues, which are mirrored by German tobacco taxation policy. The interest of this comparative analysis lies in the fact that in both cases a series of increases in the tobacco tax burden took place, focusing on the rising-revenues dimension of the policy. The first results of this research reveal signs of inefficiency in Greek tobacco tax policy and the concurrent lack of enforcement of tax law.

The article is structured as follows: Section 2 provides a brief compilation of the basic objectives of tobacco taxation in both Greece and Germany, section 3 refers to tobacco tax revenues and tax rates, section 4 examines the tax structure, and section 5 analyses consumer behavior. The concluding remarks in section 6 provide policy implications.

2. Objectives of tobacco taxation[1]

Excise taxation is either aimed at generating revenues or at steering the behavior of individuals affected by taxation. In tobacco taxation, the steering function contains the following: From a public health perspective, the tobacco tax should be set high in order to reduce tobacco consumption as it is considered a major health risk. Smokers reduce their smoking habit when confronted with an increase in prices. For smokers who plan their tobacco consumption, but always smoke more than planned, high tobacco taxes can help such time-inconsistent smokers overcome that lack in self-control. As far as smoking is related to net external costs, tobacco taxation can exert a Pigou tax function by internalizing these costs for the smoker himself, as Steidl and Wigger (2015) point out. Compared with those who have never smoked, smoking leads to higher morbidity and mortality in smokers. This translates into external costs as well as savings in both health and pension systems, which reflect on tax payers and contributors to the social security system. Tobacco tax design can further influence the extent of cross-border shopping and smuggling. The greater the tax rate differential, and thus the price differential of tobacco products between two neighboring entities, the greater the incentive for cross-border tobacco trade.

German tobacco tax rates and their structure are motivated mainly by revenue. Tax rate increases in past years were explicitly justified by fiscal reasons (Deuverden, 2004; Wigger, 2011). In addition, tax rates always increased gradually. Consumption levels usually only decline when a tobacco tax is increased significantly (Wigger, 2011). At the same time though, the public health goal was achieved. Actually, public health objectives were achieved despite the focus on an increase in revenues. Instead of a conflict of tax objectives, harmony of tax objectives prevails. Data from Statistisches Bundesamt (various years) for the period 2009-2013 reveals stable tobacco tax revenues in real terms (at €13.5 billion), despite yearly tax increases. At the same time, the share of active smokers in the total population over 15 years of age dropped by 1.2 percentage points (Statistisches Bundesamt 2011, 2014). Consumption of tobacco products decreased as well.[2] Aside from fiscal arguments and the public health goal, risks of cross-border shopping and smuggling were discussed in the budget committee hearing of the German Bundestag on tobacco taxation in 2010. The experts expressed the fear that a further increase in tax rates would lead to an increase in cross-border shopping and smuggling (Deutscher Bundestag, 2010).

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1. Steidl (2015) refers to the objectives of tobacco taxation in detail.

2. Own calculation. Data retrieved from: BMF (2014) and Statistisches Bundesamt (2011, 2014). Consumer price index (2010=100) was used for inflation of nominal tobacco tax revenues. From 2009-2013 manufactured cigarette sales decreased by 7.9%, while sales of fine-cut tobacco increased by 5.2%. Substitution effects are obvious.

The prolonged economic recession in Greece led to a decrease in public revenues. Tobacco tax increases that took place during the last years were mainly justified with the fiscal objective of tobacco taxation. Empirical research shows that, generally, revenues can increase despite (step by step) tax increases because of tobacco demand being relatively price-inelastic (Gallus *et al*., 2006). Even the argument of taxing tobacco in order to internalize external costs of tobacco consumption was used to justify another tax rate increase. An amendment of the Hellenic Ministry of Health –in law 4235/2014– in January 2014 determined that instead of a hospitalization flat fee of €25, taxation of all tobacco products was to increase by €0.05 per pack. The expected additional revenues of €48 million were planned to be dedicated to the Greek National Health System (ESY). Occasionally, further tax increases were implemented in order to comply with EU law. Decreasing consumption was considered a factoid justification for tax rate increases as well, according to the Explanatory Report of law 4063/2013 that approved the Medium-term Fiscal Strategy Framework 2013-2016. However, it remains to be proven that, in contrast to Germany, public health objectives and revenue objectives in Greece do not harmonize. The consequences of high (tax-induced) tobacco prices for cross-border shopping and illicit tobacco trade remain an issue that is not explicitly accounted for in discussions about tobacco tax rate increases in Greece.

In principle however, the main tobacco tax objectives correspond in Greece and in Germany: stable or increasing tobacco tax revenues, and decreasing tobacco consumption at the same time, as well as the prevention of illicit tobacco trade.

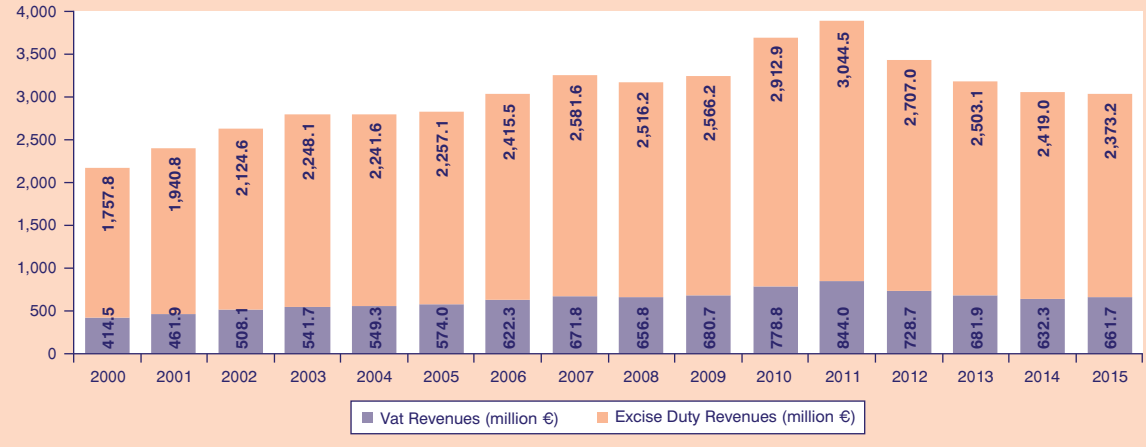
3. Tobacco tax revenues and tax rates

In Greece, total annual tobacco tax revenues (tobacco excise tax plus VAT) increased from €2.2 billion in 2000 to €3.9 billion in 2011 (Figure 1). Total revenues were mainly based on the excise tax as the revenues from the excise tax were steadily around 80% of total tobacco tax revenues. After 2011, following the deep recession and the significant increases in taxation, total tobacco tax revenues decreased by 22% to €3.0 billion in 2015.

The same trend was observed regarding the revenues from excise taxation on tobacco. While annual tobacco tax revenues increased between 2000 and 2011 from €1.7 to €3.0 billion, they then gradually decreased to €2.4 billion in 2015. In Germany, annual revenues decreased between 2006 and 2010 by about €1.0 billion, reaching 13.5 billion (Figure 2). In the following years, revenues were €14.2 billion. So, the development of tobacco tax revenues in Greece points to a position on the right hand side of the Laffer-curve. This indicates that taxes are too high for the purpose of maximizing revenues. Possible –first round– reasons for the reduction in tax revenues are the lower disposable income of the Greek population due to the economic crisis, an increase in tobacco tax and VAT rates, and the 2012 change in the tax structure. A second round reason –related to the above-mentioned– is an increase in cross-border shopping and smuggling.

Figure 3 shows the annual percentage change in tobacco tax revenues for 2006-2015. Between 2006 and 2015, the average annual growth of tobacco tax

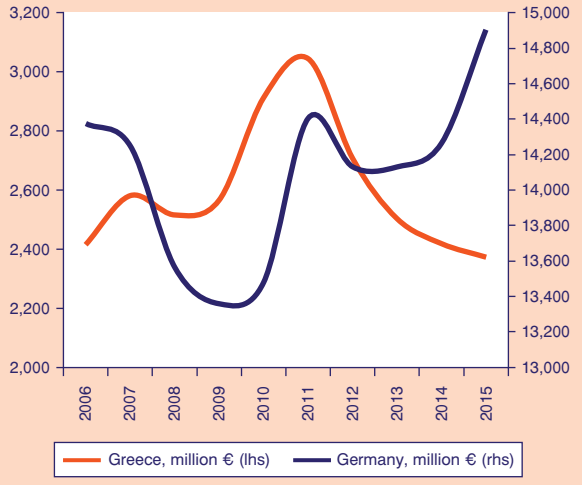
FIGURE 1
Tobacco tax and VAT revenues in Greece (2000-2015)



Source: Hellenic Ministry of Finance / General Accounting Office (2016).

revenues in nominal terms was 0.8% in Greece and 0.9% in Germany.[3] Revenues in Greece vary relatively more, especially when the year 2015 is not taken into account. In that year, Germany experienced an exceptional increase in tax revenues. In the past years, tobacco tax revenues in Greece accounted on average for 3.8% of total tax revenues. In Germany this share is 2.6%, with declining tendency.[4] So, in comparison, the Greek state relies much more on tobacco tax revenues than Germany. Any change in the Greek tobacco tax revenues has a relatively stronger influence on the balance of the state budget.

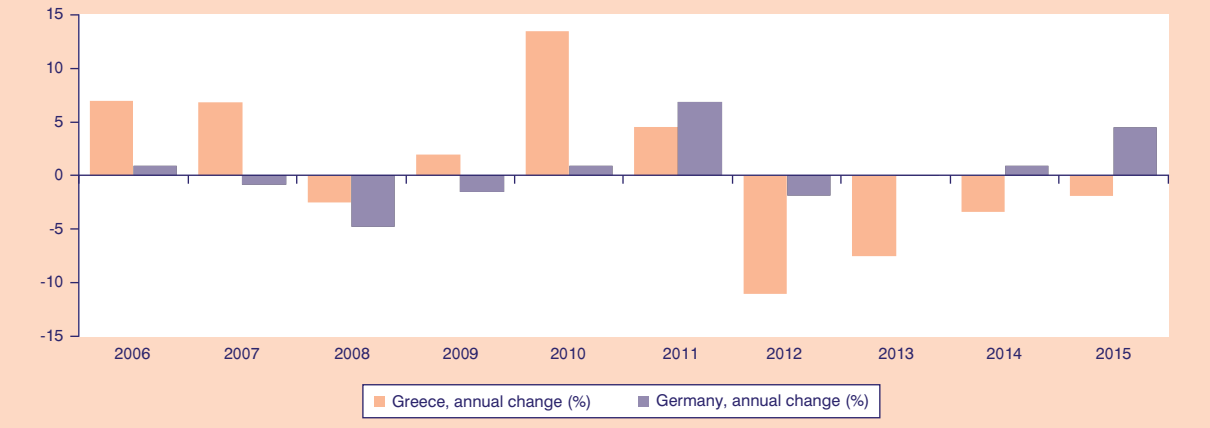
FIGURE 2
Tobacco tax revenues in Greece and Germany (2006-2015)



Source: Hellenic Ministry of Finance / General Accounting Office (2016); European Commission (various years).

Since 1993, legislation on tobacco tax rates and tax structure has been partially harmonized in the EU. Council Directive 2011/64/EU determines a global minimum rate level.[5] According to the respective Tobacco Excise Tax Acts in Germany, tobacco taxes increased three times between 2004 and 2005, and five times on a yearly basis between 2011 and 2015. Greece increased the tax in 2006, and subsequently in January, March and May of 2010, in July 2011, in November 2012, and in January 2014, while a new increase was decided for January 2017.[6] Only between 2007 and 2014 the average tax per manufactured cigarette in Greece increased from 7.3 eurocent to 14.1 eurocent (+92.4%).[7] The 7.6% tax increase in Germany during the same time only resulted in 15.1 eurocent per manufactured cigarette. The development in Greece can

FIGURE 3
Relative change in tobacco tax revenues (2006-2015)



Source: European Commission (various years).

Note: Own representation and calculation.

3. Data retrieved from the European Commission (various years).

4. Data retrieved from Statistisches Bundesamt (2015, various years) and the database "Taxes in Europe".

5. See more in Steidl and Wigger (2013).

6. The changes in tobacco tax rates are included in laws 3815/2010, 3833/2010, 3845/2010, 3986/2011, 4093/2012, 4235/2014 and 4398/2016.

7. Own calculation. Data retrieved from the European Commission (various years).

hardly be referred to EU legislation, since Council Directive 2011/64/EU determines the EU minimum tax requirement in 2013 at just 9 eurocent per cigarette. The sharp tax increase is rather due to other reasons, such as fiscal objectives. Regarding excise taxation, the specification of the economic adjustment program was to increase some taxes in order to increase public revenues (European Commission, 2010). The three tax increases in 2010 were planned to yield €645, €350, and €559 million, respectively, according to the General Accounting Office reports that accompanied the relative laws. The targeted public revenues were never reached. Following the change in the tax structure and the repeated tax increase in 2012, public revenues from tobacco taxation decreased considerably from 2012 on –contrary to the projections.

Compared to the other EU member states, tobacco tax yield per 1,000 cigarettes in both Germany and Greece was relatively lower in 2015 than ten years before. The EU average tax increased from €80.76 to €136.76 per 1,000 cigarettes (+69.3%). Germany realized an increase by 19.0% to €152.16, while Greek cigarettes yielded €118.86 (+53.1%). In the EU-wide ranking of the tobacco tax burden per 1,000 cigarettes, Germany placed 4th in 2005 and 9th in 2015. Greece ranked 14th and 17th, respectively. Consequently, tobacco tax yields must have increased even higher in other member states.[8] In 2015 Greece had the 3rd highest total tobacco tax rate (tobacco excise tax plus VAT) in the EU (85.8% of the weighted average retail selling price [WAP][9]) and 4th highest tobacco tax share (65.4% of WAP). Even in 2005, Greece was mid-table, like Germany has been until today.[10] Tobacco goods already taxed with a tobacco tax are also subject to VAT. While Germany increased VAT applicable to tobacco products from 16 to 19% in 2007, Greece´s VAT was raised from 18 to 19% in 2005, to 21% and 23% in 2010 and to 24% in 2016.

4. Tobacco tax structure

According to European Council Directive 2011/64/EU, the tobacco tax is structured as a hybrid tax. The tax comprises a price-related element (ad valorem excise) and a quantity-related element (specific excise). Different tax rules apply to manufactured cigarettes, cigars, cigarillos, fine-cut tobacco, and pipe tobacco. Tobacco tax regulation leaves sufficient freedom in tax design for EU member states. As a consequence, a large price differential exists in tobacco products across the EU. Figures from the German Tobacco Association (Deutscher Zigarettenverband, 2015) for October 2015 show that the lowest price for a pack of 20 cigarettes in the premium segment was €2.66 in Bulgaria, whilst the highest price was €12.88 in the UK. The price in Germany and in Greece was €5.89 and €3.90, respectively.

In Greece, tobacco taxation was substantially based on the price-related element that adjusted the tax burden to the retail price of the product, whilst a small share of the tax burden was related to a flat rate for all types of cigarettes no matter what their price was (specific excise). The concept of this policy structure was to adjust the tax burden according to the price of the product. So, the higher the price of the cigarettes, the higher the tax burden in real terms (in euro per cigarette), while in price-related terms the tax was equally distributed. This tobacco tax policy changed after the consequent tax increases in 2010. Initially, in July 2011 the lowest level of tax burden was set to 100% of the tobacco tax (from 75%), affecting the low-price products that benefited from the price-related element of the tax. In particular, as was underlined in the explanatory report that accompanied law 3986/2011, before 2010 the retail sales gap between low-price and high-price cigarettes was approximately €1.2, whilst after the three changes in 2010 this gap increased to approximately €1.6. So, smokers turned to low-price cigarettes. The removal of this "discount" regime was at the expense of the low-price products and contributed to the decrease of the gap, aiming –according to the explanatory report of the law– to the promotion of competition and the increase of public revenues. The critical change took place in 2012. Next to the increase in the tobacco tax rate in November 2012, the tax structure was substantially changed. The dominance of the price-related element was broken in favor of the quantity-related element. The aim of the change in tax structure –according to the explanatory report of the law 4093/2012– was to increase tax efficiency, to simplify the law and the calculation of the tax, to increase tax revenues, and to reduce tobacco consumption for health reasons.

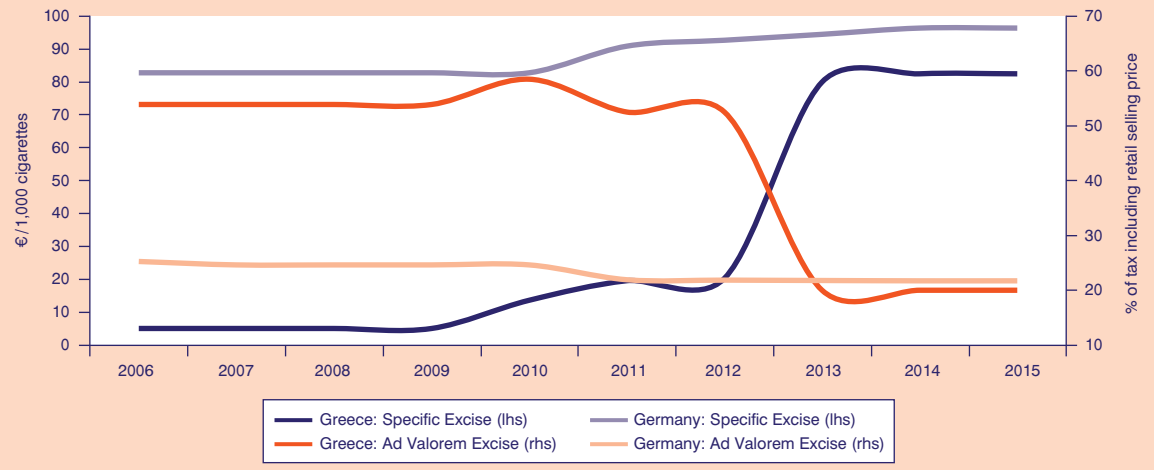
Figure 4 shows the evolution of the tobacco tax components relating to cigarettes in Germany and Greece. In Germany, and since 2012 also in Greece, a clear tendency towards the specific excise is evident. The specific tax per 1,000 cigarettes in Germany increased between 2006 and 2015 from €82.70 to €96.30 (+16.4%). The ad valorem excise share of the tax including retail

8. Data retrieved from the European Commission (various years).

9. The WAP is the retail selling price to the end-customer including VAT and tobacco tax.

10. Data retrieved from the European Commission (various years).

FIGURE 4
Evolution of the tobacco tax structure (2006-2015)



Source: European Commission (various years).

Note: Own representation.

selling price, on the other hand, decreased from 25.3 to 21.7% (-3.6 percentage points). In Greece, the specific tax per 1,000 cigarettes hiked from €5.14 to €82.50 (+1,504.2%), while the ad valorem excise share decreased from 53.8 to 20.0% (-33.8 percentage points). However, an increase of that rate to 26% has been decided for January 2017 (law 4389/2016). Only the November 2012 change in the tax structure led both to an increase of the specific tax component by 292.7% and to a fall in the ad valorem component by 61.9%.

According to data gathered by the European Commission (various years), the tobacco tax structure of fine-cut tobacco products in Germany reveals a steady tendency towards the specific component. The change in the respective tax structure in Greece was again very strong, especially between 2007 and 2014. It led to an increase of the specific excise from €0 to €156.70 per kg of fine-cut tobacco, while at the same time the ad valorem excise decreased from 59% to 35% of the tax including retail selling price.

5. Consumer behavior

5.1. Releases for (taxed) consumption

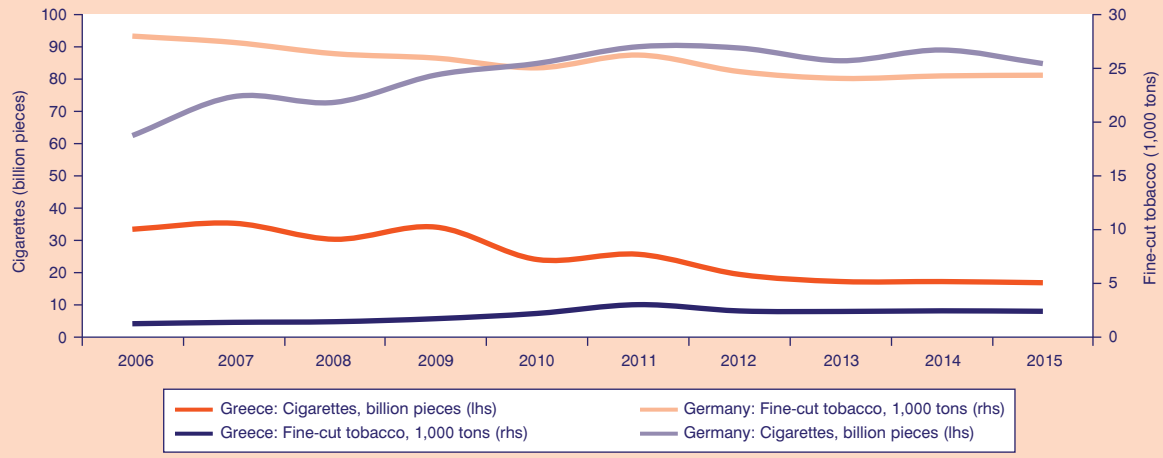
Data for the period from 2006 to 2015 show a decrease in the consumption of taxed, manufactured cigarettes in both Germany and Greece. At the same time, fine-cut tobacco consumption increased, indicating a substitution of manufactured cigarettes for fine-cut tobacco (Figure 5). Taxed consumption of manufactured cigarettes in Greece halved between 2006 and 2015 (-49.7%). In Germany, it decreased by only 13.1%. Due to the relatively larger substitution effect in Greece, sales volume of fine-cut tobacco increased relatively larger than in Germany (+93.8% versus 35.9%). EU-wide changes in sales volume amount to -31.5% in manufactured cigarettes and +42.6% in fine-cut tobacco, respectively.[11]

What are the reasons for the general decrease in taxed tobacco consumption? Economic literature argues that a tobacco tax should be increased step by step if the objective of taxation is to hold revenue at least at a constant level (Wigger, 2011). Because tobacco taxes in Greece were increased in big steps, prices increased significantly within a short period of time. Consequently, releases for taxed consumption as well as tobacco tax revenues strongly decreased. Consumers adjusted their consumption behavior to noticeable price increases. They may have stopped smoking, reduced smoking, consumed cheaper brands, substituted cigarettes for fine-cut tobacco, or relied on cross-border shopping or smuggling. Together with the dramatic decrease in disposable income in Greece, the sharp increase in tobacco tax rates led to a decrease in total taxed consumption of manufactured cigarettes.[12] This is particularly true for low income households, since,

11. Data retrieved from the European Commission (various years), KEPE (2014) and Statistisches Bundesamt (various years).

12. In Germany average household net disposable income increased between 2010 and 2014 up to 1.5% annually, while in Greece it steadily decreased by up to 10.6% annually (OECD 2015a).

FIGURE 5
Releases for taxed consumption (2006-2015)



Source: European Commission (2016).
Note: Own representation.

according to Cnossen and Smart (2005), their cigarette consumption per capita is relatively high.

Non-smoker protection laws, stemming from EU regulation and the WHO Framework Convention and Tobacco Control (including a ban on smoking in public buildings), were tightened in 2010 in Germany as well as in Greece –even though in Greece the relative non-smoking measures were not adequately implemented. The provisions contributed to the decrease in tobacco consumption.[13]

5.2. The prevalence of smoking

According to the OECD (2015b), in 2013 20.9% of the population aged 15 years and over in Germany were daily smokers (25.1% of men and 17.1% of women). Data for Greece show a smoking rate of 27.3% in 2014 (33.5% of men and 21.6% of women). This is the second highest smoking rate among EU member states. According to Eurobarometer (2012) survey results, the share of smokers and ex-smokers in Greece in 2012 was 40% and 16%, respectively. Compared to 2009 results, the average number of cigarettes smoked daily decreased to 19.4 (-2.0). Second to Cyprus, these results mark the second highest consumption rate of tobacco products per capita among EU member states. Smokers in Germany smoke 15.3 cigarettes daily on average (+0.6 cigarettes compared to 2009). The EU average is 14.2 (-0.2 cigarettes compared to 2009) (European Commission, 2012).

The Eurobarometer (2012) survey also found that 87% of Greek smokers and ex-smokers say that price influences cigarette brand choice. In Germany this is true for 53% of respondents. The EU-average is 65%. The result for Greece indicates a high price sensibility, which was further strengthened because of the significant decrease of the disposable income in Greece.[14]

The 2012 changes in tobacco tax structure in Greece led to the detriment of low-price cigarettes in particular. Compared to their high-priced alternatives, low-end brands became relatively more expensive. Between January 2009 and September 2013 retail prices of low-price cigarettes increased by 45.4% on average. However, the average price in the high-price segment only increased by 18.1% (Georgikopoulos, 2015). The relative price differential between the low and the high-price segment decreased from 40.7% to 14.3% between 2009 and 2013. As a consequence, substituting of high-price cigarettes with low-end brands was no longer attractive to consumers. Due to an increase in fine-cut tobacco taxation, the incentive to substitute manufactured cigarettes with fine-cut tobacco decreased as well (KEPE, 2014a).[15]

13. See more in the Center for Global Tobacco Control (2011).

14. Price elasticity of demand is difficult to measure because of a high share of non-taxed tobacco products. The short-term elasticity for Greece is estimated by Tarantilis *et al*. (2015) to be -0.441.

15. Also, see more in KEPE (2014b).

5.3. Illicit tobacco trade

The increased price differential between low-end brands and untaxed cigarettes made the latter more attractive for consumers. The latest data on the illicit trade volume (contraband and counterfeit) in Greece show a sharp and steady increase from 3.0% of total consumption in 2009 to 20.6% in 2014 (KPMG, 2015). KEPE (2014a) estimates differ somewhat. They suggest a rise from 10.8% in 2010 to 23% in 2013. Thus, the decline in the consumption of taxed manufactured cigarettes was partially offset by a rise in fine-cut tobacco consumption, by reduced consumption volumes, by giving up smoking, and also by an increase in counterfeit and contraband cigarette consumption.[16] The increased price differential between taxed and untaxed tobacco products led to a market for untaxed products that had been insignificantly small before. Tax policy contributed considerably to the development of such a market, as it made legal tobacco products less affordable in times of declining purchasing power.

Out of the €18.5 billion in untaxed cigarettes that were consumed in Germany in 2014, €8.2 billion stemmed from contraband or were counterfeit products. This amount accounts for 8.4% of the total consumption volume. Legal cross-border shopping in Germany accounts for 10.6% of all manufactured cigarette consumption, while in Greece it is a low 0.9%.[17]

Regarding tobacco tax structure, Chaloupka *et al*. (2010) empirically estimate for 21 EU member states that a large specific excise share leads to higher cigarette prices and lower consumption, compared to a large ad valorem share. They also find that an increasing share in specific excise leads to more stable tax revenues. Delipalla (2009) uses a theoretical model to investigate the influence of the tobacco tax structure on smuggling activities in an oligopolistic market. She finds that volumes of smuggling decrease where the tobacco tax is a hybrid tax and the tax structure changes in favor of the specific tax component. Delipalla´s findings suggest that Greece´s 2012 tobacco tax structure is in principle suitable to combat untaxed cross-border shopping. In addition, customs checks should be intensified. However, the new tax structure should be readjusted in a way that makes cheap cigarette brands more attractive as a legal alternative to contraband cigarettes. Then, tax authorities benefit from tobacco taxes being paid again. Even from a public health perspective an attractive supply of cheap tobacco brands is desirable. The regulated market gains attractiveness, since legally consumed tobacco products comply with quality standards and limitations on sales to minors apply.

6. Conclusions and policy recommendations

Although tobacco taxation is partially harmonized across the EU, differences in tax rationale and tax design can be observed in both Greece and Germany. The consequences of a change in tax rates and tax structure are predictable, explainable, and therefore manageable. The Greek tobacco tax policy of recent years inevitably had to lead to an increase in the consumption of untaxed tobacco goods and to a decline in tax revenues.

Several substantial rises in tobacco tax rates and a sudden change in tax structure met a decline in purchasing power among the Greek population. Tobacco products, and especially the low-price ones, became less affordable. As a consequence, smokers changed their consumer behavior. Many gave up smoking at all or reduced consumption. Others substituted manufactured cigarettes with fine-cut tobacco. In parallel, cheaper cigarette brands lost their attractiveness due to the change in tax structure and untaxed cigarette consumption rose dramatically. In terms of policy, the economic adjustment program's target to increase tobacco tax revenues was not achieved. On the contrary, a sharp decline in tax revenues was the result of the followed policy, even though it was not intended. Furthermore, the simultaneous decrease in tobacco consumption benefited public health, which had also not been the policy goal.

In order to stabilize the tobacco tax as a source of revenue, to take public health issues into account, and to combat illicit tobacco trade at the same time, Greece should reduce tobacco tax rates and adjust the tax structure once more. If the price-related tax component gains in importance again, low-price tobacco products will become more attractive. With a lower incentive to participate in cross-border shopping and illicit tobacco trade, more domestic tobacco products that meet EU quality standards will be consumed. Additional tax revenues are generated domestically, where external costs of smoking accrue.

In this framework, the small "turn" of the taxation burden to the ad valorem part of the excise tax in

16. Untaxed tobacco products include tobacco products that are neither taxed in the country of origin nor in the country of destination. It also includes imported tobacco products that exceed the exemption limits without being declared.

17. Data retrieved from KPMG (2015).

2017 (from 20% to 26%) is a step in the right direction, even though the result will be insignificant as the heavy burden (based on the quantity-related element) remains in place.

What can Greek policy makers learn from the German tobacco tax model when faced with adverse effects of tobacco tax policy? Tobacco taxation in both Germany and Greece is based on the same EU legislation, conceding sufficient freedom for the design of national tobacco tax policy. The German tobacco tax model balances revenue objectives with steering functions, and follows economic theory and empirical findings regarding tax design. It therefore is not ideally suited to serve as an example for Greece. Instead, a consistent alignment of tobacco tax policy with economic literature is reasonable. Regarding the fine adjustment, country-specific characteristics, such as consumption patterns or the economic situation, should be considered.

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