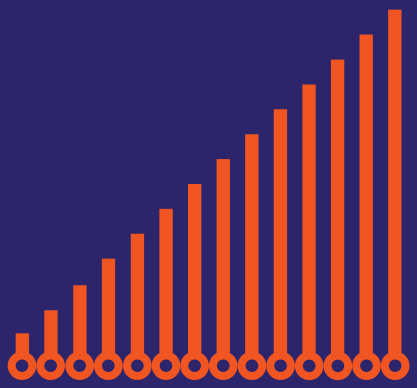
CENTRE OF PLANNING AND ECONOMIC RESEARCH

Issue 32, February 2017

GREEK ECONOMIC OUTLOOK



- Macroeconomic analysis and projections
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- Human resources and social policies
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Issue 32 - February 2017

Editorial

The 32nd issue of KEPE's *Greek Economic Outlook* is published at a particularly difficult and challenging time, not only for Greece but also for Europe and many other parts of the world. The second evaluation –under the Financial Assistance Facility Agreement– has been frozen for several months: in addition to the terms that have not yet been implemented, Greece's creditors are seeking additional measures in order to meet the requirements of the International Monetary Fund and to ensure its participatation in the program. Beyond Greece's borders, the departure of the United Kingdom from the EU, the aftermath of Donald Trump's election in the USA, and the rise of populist, extremist and eurosceptic parties in Europe have all caused tremendous uncertainty and insecurity, especially in light of upcoming elections in Germany, France and the Netherlands this year. In this environment, the ongoing debate concerns the intention of both the Greek government and its European partners to finalise the evaluation quickly, in order to stabilize the Greek economy and to dispel any rhetoric of a Grexit scenario which has recently re-emerged. As always, KEPE's *Greek Economic Outlook* contributes to this discussion through articles covering crucial current issues as well as policy proposals.

The journal consists of two sections: Part One is comprised of articles that offer an overview of current issues relating to the Greek economy, while the articles in Part Two impart a deeper and more specialised analysis of important current topics. Specifically, Part One addresses recent developments and prospects in the main demand components, the evolution of the Consumer Price Index (CPI) in Greece and the Eurozone, the factor model forecasts for short term prospects of GDP as well as an overview of recent developments and prospects in the international macroeconomic environment. Public finances are examined through an analysis of the State Budget and its evolution during the economic crisis as well as the evolution and structure of public debt. Recent developments in key variables of the Greek labour market are also discussed, and an overview of recent trends in the Greek health system and a comparative analysis with the other European countries is also presented. Finally, as far as sectoral policies are concerned, the articles examine the competitiveness of the Greek economy, developments in the regulatory framework of entrepreneurial activity in Greece, and recent developments in the Greek heating oil market.

Part Two of the journal hosts three in-depth and specialised articles that focus on important current topics. The first article presents "The evolution of the manufacturing sector in the period 1995-2013", the second article analyses "Participation and possibilities of Greece in global value chains", while the third article examines "The acquisition & management of the NPLs from investment funds and companies in Greece".

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, November 2016), the third quarter of 2016 was characterized by a clear improvement of conditions in the Greek economy, with the rate of change of the GDP recording an increase of 1.8% as compared to the corresponding quarter of the previous year (Table 1.1.1). This positive turn in the GDP reflects mainly a significant boost in domestic demand, associated with the progressive normalisation of economic conditions, the decline of uncertainty and the easing of the consequences of capital controls. These factors seem to have favoured considerably both fixed capital investment and private consumption, with the latter exhibiting a significant recovery after four consecutive quarters of decline. Overall, the increase in domestic demand during the third quarter of 2016 stood at 4.7%, resulting in a positive contribution to GDP growth amounting to 4.8 percentage points (Figure 1.1.1).

With respect to developments in the external sector during the third quarter of 2016, the improvement of domestic economic conditions, as well as exogenous factors such as the increase in ocean shipping freight rates, seem to have had a positive influence on exports, as these exhibited a considerable increase fol-

TABLE 1.1.1 Main macroeconomic aggregates

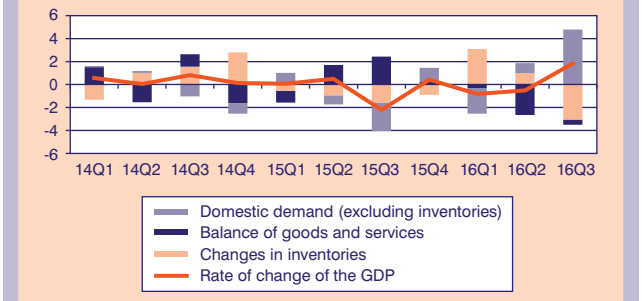
% rates of change compared to the corresponding period of the previous year (seasonally adjusted data at constant prices)

	2015Q1	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2	2016Q3	9 month period Jan.-Sept. 2016	9 month period Jan.-Sept. 2015
Private consumption	1.3	1.9	-4.1	-0.4	-0.8	-1.2	5.1	1.0	-0.3
Public consumption	-0.1	-3.1	0.8	2.5	-2.1	-0.9	-0.6	-1.2	-0.8
Gross fixed capital formation	4.9	-13.0	-4.4	12.2	-9.5	17.9	12.6	6.1	-4.2
Domestic demand*	1.0	-0.8	-2.4	1.2	-2.1	0.9	4.7	1.1	-0.7
Exports of goods and services	12.5	10.3	-7.0	-2.2	-10.5	-3.2	10.2	-1.6	5.0
Exports of goods	10.1	7.4	7.0	10.0	2.4	20.5	9.5	10.7	8.1
Exports of services	15.0	14.8	-21.8	-14.9	-22.8	-24.6	10.5	-14.1	1.5
Imports of goods and services	15.1	4.0	-14.1	-2.7	-8.7	4.9	12.0	2.0	1.4
Imports of goods	14.7	4.1	-7.7	3.5	-2.1	14.7	7.5	6.6	3.4
Imports of services	16.8	3.8	-39.2	-26.7	-31.6	-29.9	38.1	-15.6	-6.6
Balance of goods & services	54.3	-50.6	-151.8	-7.5	11.8	160.8	-49.8	92.0	-45.6
GDP	0.1	0.5	-2.2	0.4	-0.8	-0.5	1.8	0.2	-0.6

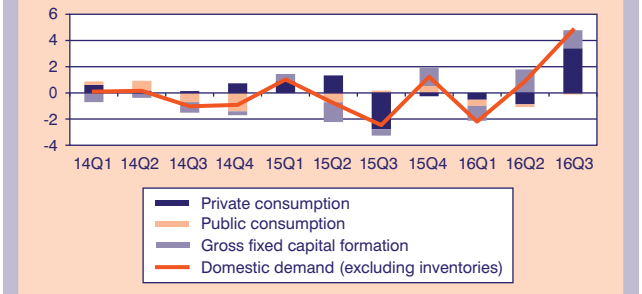
Source: National Accounts, ELSTAT (November 2016), own calculations.

* Excluding the change in inventories.

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

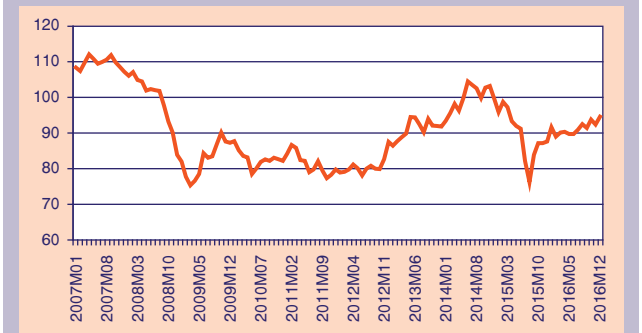


Individual components of domestic demand



Source: National Accounts, ELSTAT, own calculations.

FIGURE 1.1.2
Economic sentiment indicator



Source: EUROSTAT.

lowing four consecutive quarters of decline. In parallel, the recovery of domestic demand appears to have exercised further upward pressure on imports, which had already entered an upward track in the second quarter of the year. On the whole, the negative contribution to the rate of change of the GDP from the increase in imports outweighed the corresponding positive contribution from the rise in exports, the result being a negative contribution of the external sector to the rate of change of the GDP in the third quarter of 2016 (-0.4 percentage points).

From the aforementioned evolution in the figures of domestic demand and the external sector, it is evident that a major role in shaping the rate of change of the GDP in the third quarter of 2016 was also played by developments in inventories. As it seems, the sudden recovery of domestic demand during this period was covered to a significant extent via the consumption of stocks, the result being a sizeable negative contribution of the change in stocks to the rate of change of the GDP (-3.1 percentage points).

The improvement of conditions in the Greek economy, as depicted in the aforementioned *National Accounts* data, is also reflected in the recent path of the economic sentiment indicator (see Figure 1.1.2). In general terms, the indicator followed a rising trend during the period July-December 2016, thus signaling that the course of stabilization and the progressive recovery of the economy continued in the fourth quarter of the year.

Regarding the main factors shaping the aforementioned developments in the GDP and its main components, next follows a more detailed analysis of their evolution and prospects, on the basis of *National Accounts* data and selected short-term indicators.

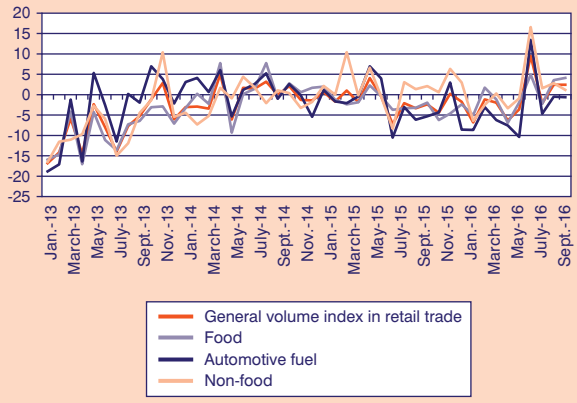
1.1.1. Private consumption

The considerable increase of private consumption in the third quarter of 2016 represents mostly a recovery from the losses recorded during the corresponding quarter of the previous year, when the bank holiday and capital controls inflicted a major blow to household consumption expenditure. According to *National Accounts* data, the rate of change of private consumption stood at 5.1% in the third quarter of 2016, from -4.1% in the third quarter of 2015, and as a result the contribution of private consumption to the rate of change of the GDP reached 3.4 percentage points, from -2.8 points, respectively.

Additional indications regarding the recent dynamics of private consumption expenditure are provided by the evolution of the monthly volume index in retail trade for the period July-October 2016[1]. More particularly, following the continuous decline observed in the first half of the year, the general index recorded a significant recovery in July (9.5%), a decline in August (-2.1%) and again an increase in September (2.4%)

1. The data for October are provisional.

FIGURE 1.1.3
Percentage changes in the general volume index and the main sector indices in retail trade



Source: ELSTAT, own calculations.

and October 2016 (2.4%). Positive contributions to the development of the general index in July 2016 came from the side of all three main retail sector categories, namely the *food* sector, the *automotive fuel* sector and the *non-food* sector. With respect to developments in the general index in the course of September and October 2016, positive contributions came from the side of the *food* sector and the *non-food* sector, while in the case of the index of the *automotive fuel* sector the relevant percentage changes were slightly negative (Figure 1.1.3).

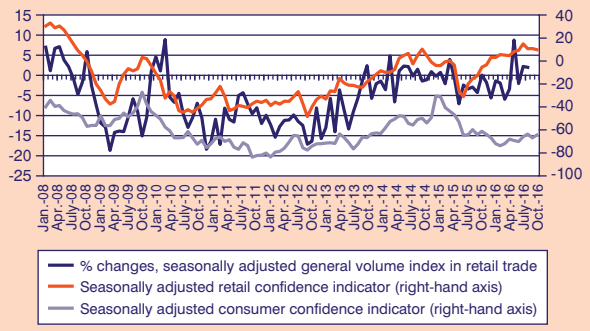
The above trends are also mirrored in the evolution of the indices in the individual retail store sub-categories, where in six out of the eight cases the period from July to October 2016 was characterized on average by positive developments. More particularly, the indices referring to *supermarkets, department stores, automotive fuel, clothing-footwear*, *furniture-electrical equipment-household equipment* and *books-stationery-other books* registered for this period as a whole positive percentage changes compared to the corresponding period of 2015 (amounting to 3.0%, 8.4%, 1.5%, 11.8%, 1.5% and 9.7%, respectively). On the contrary, marginally negative rates of change were recorded over the same period for the indices of the *food-beverages-tobacco* and *pharmaceuticals-cosmetics* sub-categories (amounting to -0.5% and -0.3%, respectively).

It is worth pointing out that in July 2016 the relevant indices recorded high positive rates of change in seven out of the eight individual sub-categories, while during the remainder of the period examined a tendency towards milder increases or a shift to negative rates of change was observed. Furthermore, it is notable that during the period from September to October 2016, increases in the indices of the main categories referring to the *food* sector and the *non-food* sector were mostly due to positive developments in the *supermarkets* and *department stores* sub-categories. At the same time, performance in the case of smaller size stores appears to have been weaker, as reflected both by the downward trend of the index referring to the *food-beverages-tobacco* and *furniture-electrical equipment-household equipment* sub-categories and by fluctuations in the index for the *clothing-footwear* sub-category.

On the basis of the above data, the dynamic recovery of private consumption over the third quarter of 2016 appears to have originated to a considerable extent from the large increase in retail sales recorded in the month of July, when the summer sales coincided with a considerable improvement of the economic climate compared to the corresponding, difficult period of the previous year. However, indications for a milder but significant recovery in private consumption are also visible in the months of September and October, despite the pressures on household disposable income arising from the implementation of recent fiscal adjustment measures and the obligations for payment of income and property tax installments. These latter indications appear to signify a steady strengthening of the possible positive effects on consumption from the gradual stabilization of the economic environment and the slow but consistent improvement of the main labour market figures.

With respect to the prospects of private consumption, the continuation of the recovery in the near future will depend to a great extent upon the timely completion of the second review of Greece's financial assistance programme, and the resulting further reduction of uncertainty in the economy. Clearly, in the current conjuncture the importance of these conditions is accentuated by the need for counterbalancing the significant adverse effects on consumption from the implementation of fiscal measures imposing burdens on the disposable income of certain categories of households. In any case, at present, most indications point towards a continuation of the recovery of private consumption in the short-term, albeit at a more moderate pace compared to the third quarter of 2016. This prospect appears to be also supported by developments in consumer expectations, as the consumer confidence indicator followed recently an upward trend, reaching -64.4 points in December, from -70.1 points in August 2016. However, retailers appear recently to be more apprehensive with respect to the course of private consumption, as following the significant improvement of the retail confidence indicator from -3.4 points in January to 15.0 points in September 2016,

FIGURE 1.1.4
General volume index in retail trade and confidence indicators



Source: EUROSTAT, own calculations.

the index declined to 9.8 points by December of the same year (Figure 1.1.4).

1.1.2. Investment

The path of recovery which gross fixed capital formation had entered since the second quarter of 2016 continued in the third quarter of the year, with the rate of change of investment expenditure amounting to 12.6% (Table 1.1.2). As a result, the contribution of investment to the rate of change of the GDP reached 1.4 percentage points in the third quarter of 2016, from 1.8 and -1.1 points in the previous two quarters, respectively.

More particularly, with regard to investment other than construction, developments in the individual categories during the third quarter of 2016 were in most cases favourable. Specifically, expenditure on machinery and equipment and ICT equipment registered a major rise (34.9% and 19.5%, respectively during this period), while a mild increase was also recorded in investment in other products. In contrast, in the case of investment in transport equipment, the large increase observed during the second quarter of 2016 appears to have been halted in the third quarter of the year, with the relevant rate of change reverting to a negative level (-14.7%).

With respect to investment in construction, in the case of the other constructions category the rising trend observed since the third quarter of 2015 continued dynamically during the third quarter of 2016 (20.1%). In addition, in the case of housing, a notable development in the third quarter of 2016 was the curtailing of the relevant rate of decline of investment to a level much milder than the rates prevailing over the past several years (-3.7%).

Additional information on developments in the construction sector as a whole is derived from the available

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							9 month period Jan.-Sept.	
	2015Q1	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2	2016Q3	2016	2015
Cultivated assets	-7.4	-4.2	-1.3	2.5	-2.6	1.0	-0.2	-0.5	-4.0
Other machinery and equipment and weapon systems	26.2	11.5	-14.5	1.1	-1.6	2.3	34.9	10.7	6.1
Transport equipment and weapon systems	87.9	-49.7	-8.3	-31.2	-43.7	125.4	-14.7	0.9	0.9
Information Communication Technology (ICT) equipment	29.6	5.6	-11.6	6.6	-9.0	2.5	19.5	3.6	6.3
Dwellings	-33.4	-11.7	-36.4	-18.5	-17.0	-23.3	-3.7	-15.5	-27.9
Other construction	-12.6	-4.8	1.5	40.9	13.6	19.1	20.1	17.6	-5.5
Other products	-1.1	1.8	2.6	4.8	0.2	0.8	1.5	0.8	1.1
Gross fixed capital formation	4.9	-13.0	-4.4	12.2	-9.5	17.9	12.6	6.1	-4.2

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

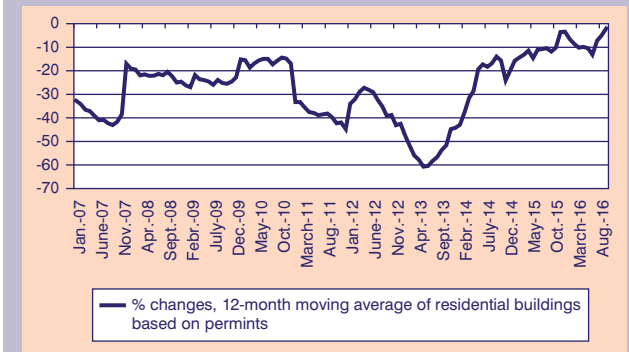
statistical data on the course of the general production index in construction during the third quarter of 2016.[2] As it appears, the index exhibited significant improvement for a second consecutive quarter, recording a particularly high positive rate of change (in the area of 77.4%) compared to the corresponding quarter of 2015. This development was due both to the rapid rise of the sub-index of the production of civil engineering (93.9%), which relates to infrastructure works (e.g. highways, bridges, tunnels, pipelines, networks and port development), and to the large increase of the sub-index of the production of building construction (55.5%), which reflects developments in the construction of dwellings, industrial and commercial buildings and other buildings.

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 improvement in the most recent reference period. More specifically, the monthly percentage changes of the indicator on a year-on-year basis were positive in July, August and September 2016, while in parallel, the negative rates of change in the estimated private building activity gradually subsided (-7.2% in July, -4.9% in August and -2.0% in September) (Figure 1.1.5).

Overall, the observed improvement in most investment categories during the third quarter of 2016 is related to the further smoothening of economic conditions in the country, the unwinding of uncertainty, the resulting gradual recovery of investors' confidence, and the progress with respect to road works and other construction projects. Nevertheless, in parallel, the decline in transport equipment and housing investment, and the limited extent of the recovery in investment in other products, reflect the continuing 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.

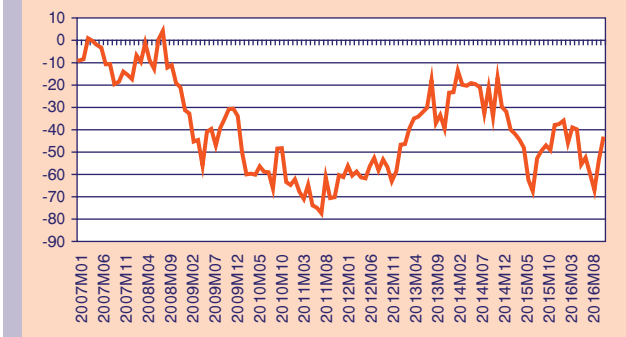
With respect to the short-term prospects for fixed capital formation, the recent recovery in some investment categories points to overall positive prospects for investment expenditure in the upcoming quarters. Moreover, favourable indications for the construction sector arise on the basis of the construction confidence indicator, as the deterioration of the index in September and October 2016 was followed by a recovery in November and December (Figure 1.1.6). However, it must be noted that a key requirement for the fulfilment of these prospects, but also a decisive factor for the intensity of the recovery in investment, is the smooth implementation of the country's financing programme, the improvement of financing conditions in the economy and the progress with respect to major investment projects.

FIGURE 1.1.5
Estimated residential building activity based on permits



Source: EUROSTAT.

FIGURE 1.1.6
Construction confidence indicator



Source: EUROSTAT.

1.1.3. External balance of goods and services

As mentioned above, developments in the main aggregates of the external sector during the third quarter

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

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.

of 2016 reflect the improving conditions arising from the progressive stabilization of the Greek economy, as well as favourable developments in exogenous factors.

More particularly, concerning exports, the third quarter of 2016 was characterized by a major increase in the case of goods (9.5%), and a notable positive turn in the case of services (10.2%), the result being a positive contribution of 2.9 percentage points to the rate of change of the GDP (see Figure 1.1.7). The recovery in services exports was due to increases in receipts, both in the transportation category (by 29.0% according to Bank of Greece data), where the effects of the rise in ocean shipping freight rates were visible, and in the other services category (by 55.7%, according to the same data source). In contrast, tourism receipts followed a downward trend in July and August, resulting in a negative rate of change in the third quarter of 2016 (-4.3%, according to Bank of Greece data).

With respect to imports, the recovery of domestic demand in the third quarter of 2016 appears to have had a sizeable impact on the demand for imported products and services. More particularly, in the field of services imports there was a turnaround to a high positive rate of change (38.1%), while in the field of goods imports a significant increase was observed (7.5%) for a second consecutive quarter. As a result of these developments, the contribution of imports to the rate of change of the GDP amounted to -3.4 percentage points in the third quarter of 2016.

Concerning the prospects of the external sector, the foreseen improvement of the domestic economic environment is expected to boost the demand for imports, while also creating better conditions for the strengthening of exports. In this framework, the balance of the external sector and its contribution to the GDP will depend critically upon the scale of export growth, 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 in the more recent period clear signs of improvement of conditions in the Greek economy. This picture agrees with the forecasts provided by the KEPE dynamic factor model (see Section 1.3), according to which the rate of growth of the Greek GDP is expected to increase in the first half of 2017. On the basis of recent trends, this positive prospect is expected to be supported by a favourable development in gross fixed capital formation, while a progressive improvement is also 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. Furthermore, smoother developments in the forthcoming quarters are expected with respect to the components of the external sector, with goods imports increasing and exports being favoured by the improvement of the domestic environment.

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

Yannis Panagopoulos

Based on the recent trend (December 2016), as indicated from the first column of Table 1.2.1 and from Diagram 1.2.1, for the first time since February 2013, we do not have deflation in the Greek economy. Specifically, in December 2016, the change of the national consumer price index (CPI) was 0.0% (headline inflation). This does not necessarily mean that deflation in Greece has permanently ended, but that there is at least a weak momentum to return to inflationary changes on prices. On the other hand, the changes of the core of the national CPI remained in negative but decreasing "territory" and, therefore, it gradually approaches the zero level. For the time being (December 2016), however, it is -0.6%.

On the other hand, the trend of the harmonized CPI (HCPI) seems to differentiate somehow from the national CPI. More specifically, unlike the national CPI, this index followed slightly positive and negative price changes for the whole of 2016. In December 2016, however, the HCPI recorded a slightly positive change of 0.3%. On the other hand, its core showed only slightly positive changes for 2016, although, based on the most recent available data, in December it recorded zero change (0.0%).

Additionally, according to the Hellenic Statistical Authority (ELSTAT), the aforementioned zero headline inflation rate (0.0%, y-o-y, in December 2016) can be mainly attributed to subsequent price decreases in seven (7) main sub-categories, namely: (a) the "Household equipments" category (by 2.8%) mainly due to decreases in some household textile products, in large household appliances, electrical or not, in household consumption items as well as in immediate household & care services, b) the "Miscellaneous goods and services" category (by 1.5%) basically due to reductions of the prices of personal care products as well as for car and motorcycle insurance, c) the "Recreation and culture" category (by 1.5%) mainly due to decreases in the prices of optical and visual equipments of PCs,[1] d) the "Clothing and footwear" category (by 1.2%) due to price decreases of these products, e) the "Food and non-alcoholic beverages" category (by 0.8%), due to price decreases mainly in fresh fish, meat, milk products, eggs, bread, dried fruits, etc.,[2] f) the "Education" category (by 0.4%) mainly due to decreases in the fees for secondary schools and g) the "Health" category (by 0.1%) especially due to price decreases in exclusive nurse services and paramedical services.[3]

Part of the aforementioned zero inflation process was offset by the increase in the prices mainly of five (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)
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	-0.1	0.4	1.3	0.2	0.8
2016M9	-1.0	-0.2	-0.1	0.7	0.4	0.8
2016M10	-0.5	-0.6	0.6	0.9	0.5	0.7
2016M11	-0.9	-1.0	-0.2	0.0	0.6	0.8
2016M12	0.0	-0.6	0.3	0.0	1.1	0.9

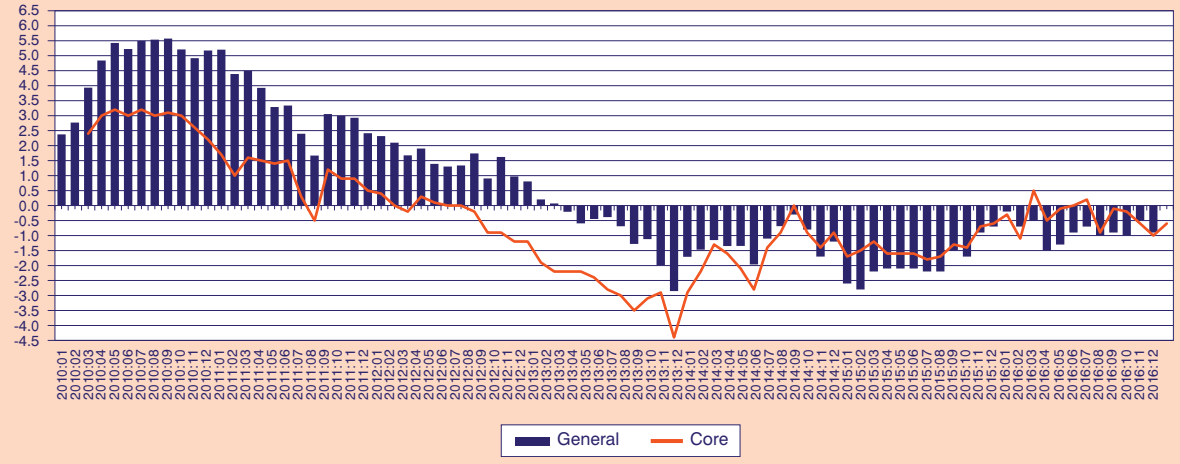
Source: ELSTAT, EUROSTAT.

1. Part of this decrease was offset by increases in the fees of State Television (ERT) and the cable television.
2. Part of this decrease was offset by increases in the prices of fresh fruit, olive oil and potatoes.
3. Part of this decrease was offset from increases in the prices regarding pharmaceutical products.

sub-categories, namely: (a), the "Alcoholic, drinks and tobacco" category (by 2.0%) basically due to price increases of these products, b) the "Housing" category (by 1.8%) due to increases in the prices of residential heating,[4] c) the "Restaurants-Hotel-Café" category (by 1.3%) mainly due to increases in their prices, d) the "Transportation" category (by 1.2%) mainly due to increases in the price of gasoline, of toll fees and airplane tickets[5] and e) the "Communication" category (by 0.7%) mainly due to increased fees for telephone services.

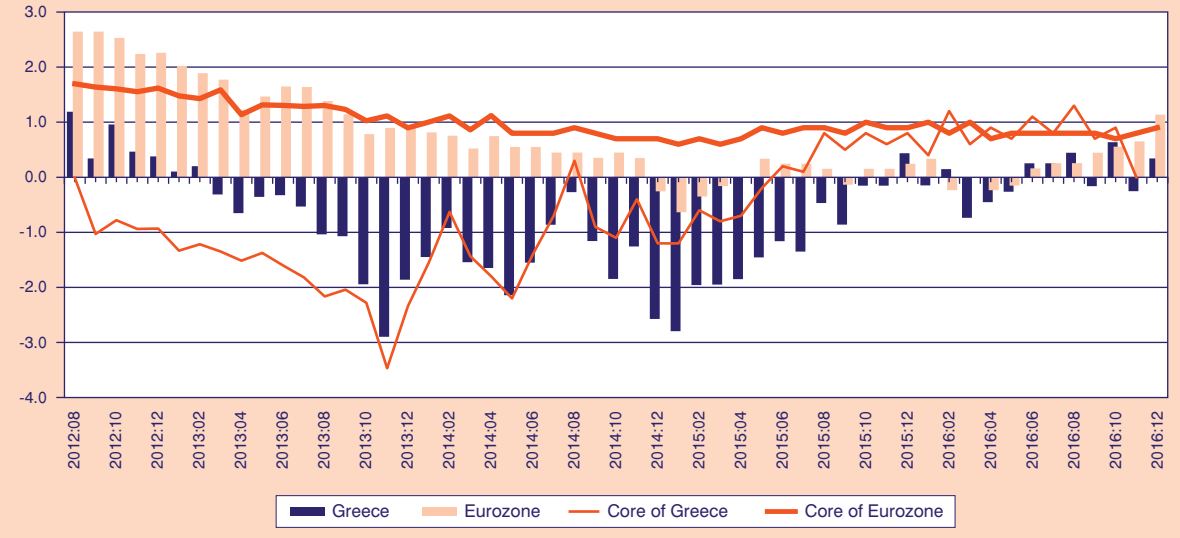
Regarding the harmonized CPI of the Euro area (HCPI-EU19), we can mention here that in the past few months it has been moving with an upward trend. More specifically, from 0.1% in June 2016, the HCPI

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.

4. Part of this increase was offset by decreases in the prices of electricity.

5. Part of this increase was offset by decreases in the prices of cars and of the combined public transports.

rose steadily to 1.1% in December 2016. At the same time, the core of HCPI-EU19 (does not include unprocessed food and energy) has continued to move steadily, during the last months, with slightly positive changes (between 0.7% and 0.9%). This implies that the little difference that existed between the HCPI-EU19 and its core, until the summer of 2016, has gradually ceased to exist. Regarding now the Greek HCPI, as we also observe from Diagram 1.2.2, it is changing with some volatility (with positive and negative values) around zero. Its core, on the other hand, after August 2016 presents some descending changes from 1.3% towards zero. It therefore follows the Greece HCPI trend but without its volatility.

In conclusion, the HCPI trend in the last months of 2016, regarding Greece, moves towards zero (0.0%) while regarding the Eurozone, it converges towards a positive percentage change of almost 1.0%. Additionally, the core difference of these two indices, as shown in Diagram 1.2.2, also appears with almost 1.0% of difference. Therefore, for the time being, the view recorded in the previous issue of the *Greek Economic Outlook* (issue 31) concerning a possible convergence of the two HCPI and their cores, is not verified.

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 quarter of 2016 and the first two quarters of 2017. 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 includes 126 variables, covering the main aspects of economic activity in the country on a quarterly basis, spanning the time period from January 2000 up to September 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 econometric estimates presented in Table 1.3.1, and having incorporated published seasonally adjusted GDP data up to the third quarter of 2016 and the estimated positive rate of change of 1.0% for the last quarter of 2016, the mean annual rate of change of real GDP is predicted at 0.4% for the whole year 2016. This forecast represents an upward revision of the forecast made in the preceding period of reference (-0.1%) and, at the same time, signals a switch to a positive annual rate of change of the GDP in 2016. In addition, the estimated rates of change for the first two quarters of 2017 indicate a considerable improvement in economic conditions during the first half of the year, as compared to the corresponding time period of 2016, uncovering a rising trend in the estimated positive percentage changes. More specifically, the forecast for the first half of 2017 lies at 2.1%, with the predictions for the rates of change of real GDP in the first and second quarters amounting to 1.9% and 2.2%, respectively.

The above presented forecasts of the rate of change of real GDP reflect the key dimensions of the most recent short-term developments in the Greek economy. In particular, the predicted growth rates seem to confirm the reversal of the unfavourable economic climate which prevailed in mid-2015, and also affected economic conditions during the first half of 2016, as well as the shift towards stabilization and gradual economic recovery. The major factors justifying the above projections are rooted in the progressive creation of a steady environment based on (a) compliance with the agreed obligations, within the framework of the financial assistance programme in force, with emphasis

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

Year	**2016**	**2017**	
Quarters	2016Q4	2017Q1	2017Q2
Quarterly rate of change	1.02 [0.95, 1.10]	1.95 [1.81, 2.09]	2.21 [2.01, 2.41]
Mean annual (2016) – six-month (2017) rate of change	0.40* [0.38, 0.42]	2.08 [1.91, 2.25]	

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

* The figure incorporates official seasonally adjusted data for the first three quarters of 2016.

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

on rebalancing fiscal aggregates and promoting the necessary structural reforms, as well as (b) the commitment of the implemented policy to provide smooth financing conditions and enhance the domestic production capacity, in order to fight unemployment and ensure long-term viable economic growth.

The recent course of a significant number of economic variables seems to be in line with the above findings and assessments. In more detail, useful indications emerge from the analysis of the additional information incorporated in economic data for the third quarter of 2016 (as examined on a non-seasonally adjusted basis). It should be stressed at this point that the comparative analysis is carried out relative to the corresponding quarter of 2015, during which the Greek economy suffered a particularly serious shock. Apart from the downward course in certain economic variables (such as investment in transport equipment, travel receipts, spreads, the General Index of the Athens Stock Exchange), but also in individual index categories (like the industrial production index for the sector of energy, the turnover index in industry for the category of durable consumption goods, the volume index in retail trade for the category of pharmaceuticals/cosmetics, etc.), mostly favourable developments can be identified, in many cases even characterized by considerable positive rates of change. Indicatively, an improved path was recorded in (a) major macroeconomic aggregates, such as private consumption, investment, exports of goods and services, (b) basic indicators in industry, like the general industrial production index and the general turnover index in industry (in total, but also for the internal and external markets), (c) indicators related to trade, such as the general volume index in retail trade, the general turnover index in wholesale trade and the turnover index for motor trade, (d) indicators concerning construction and building activity, like the production index in construction and building activity based on permits issued, (e) indicators reflecting competitiveness, and (f) transport receipts. Furthermore, an upward course characterized most of the indicators reflecting and incorporating business expectations on a sectoral level (excluding business expectations in construction), as well as assessments for orders in industry and exports, but also the overall economic sentiment indicator for Greece. Particular significance is attached to the continuation of the gradual reduction in unemployment and the preservation of the increasing trend in employment, despite the largely adverse conditions still characterizing the domestic labour market.

The projected path of real GDP in the last quarter of 2016 and the first half of 2017 can be expected to evolve in a more or less favourable direction than indicated by the above presented forecasts, depending on a wide range of critical and decisive factors. These relate, on the one hand, to the completion of the second review on the country's programme, an agreement on the issue of the Greek debt and Greece's inclusion in the Quantitative Easing programme of the European Central Bank. On the other hand, they are linked to the implications of the current financial assistance programme, including all the associated financial burdens and constraints affecting household disposable income and business activity.

1.4. International macroeconomic environment: recent developments and prospects

Yannis Panagopoulos

1.4.1. Overview

Based on the macroeconomic outlook, presented in Table 1.4.1, the global economy is on a track of recovery, although with a non-homogeneous character. More analytically, in accordance with the existing evidence, it appears that for 2017 the world economy will grow at a rate ranging from 3.2% to 3.4% of the GDP. It is, however, obvious that there is a differentiation between countries, regarding the pace of the macroeconomic growth as well as the factors which affect it. Additionally, other notable elements which lately affect global growth are the political factors emerging mainly in the developed world (populism, isolationism and nationalism), without detracting our analysis from the other international risk factors which threaten to undermine the development of the global economy (e.g. the economic progress of China, the structural changes internationally, the non-performing loans [NPLs] especially in the Eurozone, etc.). It should also be underlined here that the largest part of our analysis will focus on the European economy (the Eurozone, EU countries outside the Eurozone and the candidate countries for accession to the EU) due to the geographical, economic and political interest of our country. A short report, regarding Greece, will also appear in this article. At the end of the article some long-term economic policy proposals are presented, derived from the major international organizations (e.g. IMF, OECD, etc).

1.4.2. Developed economies (outside the Eurozone)

With the term "developed economies" we refer to four advanced economies (G4: Canada, Japan, the USA and the United Kingdom [UK]). Specifically, as it is reported from the outlook of various financial institutions (see Table 1.4.1), it is expected that the average growth of the developed economies will be around 1.3%-1.6% for the 2017. This growth is expected to come mainly from the active aggregate demand with the support derived from the growth of their employment. The average inflation rate is expected to be around 1.5% to 1.9%. This increase in the inflation rate will come mainly from the gradual recovery of fuel prices internationally. The projected variations of the "output gap"[1] from country to country show slightly negative values for Canada and the US and slightly positive values for Japan and the UK. These estimations justify the view that the G4 economies are moving closer to their production capabilities.

The average rate of unemployment (as shown in Table 1.4.1) is expected to move at a relatively low level in 2017 (below 5%). The anticipated average level of unemployment would be even lower if Canada –in contrast to the other three economies– had not presented a relatively high level of almost 7.0% in 2016. Nevertheless, as mentioned before, the expectations for a further decline in the unemployment rate, for the non-EU developed world, are generally favorable.

At a country level, the US is expected to achieve economic growth of around 2.3% in 2017 (from 1.5% in 2016). Moreover, the unemployment rate in the country will remain at 4.7% while inflation will rise slightly to 1.9%. Finally, the US output gap is estimated to be significantly reduced to -0.4% (from -1.2% in 2016) due to the GDP increase. As regards to Japan, moderate growth (0.4%-1.0%) is expected for 2017, which will primarily rely on both the continuing quantitative easing and the ongoing structural changes. The unemployment rate will remain stable around 3.0% while inflation will move marginally above zero (0.3%). It is important here to mention that Japan is one of the few OECD economies that will experience a positive output gap in 2017, indicating the existence of an overheating aggregate demand in the economy. For Canada, a higher economic recovery is expected for 2017, reaching around 2.1% (from 1.2% in 2016). This will be primarily based on a moderate fiscal extension and a slight depreciation of the Canadian dollar accompanied by the removal of any legal obstacles related to FDI in the country. On the other hand, the prolonged high level of unemployment in the country is noticeable (around 7.0%), despite the serious reduction in the output gap (-1.0% for 2017 from -1.8% for 2016).

The UK is a different case by itself because it operates under the influence of the anticipated Brexit. Actually, it incorporates a high level of uncertainty for 2017 on the main macroeconomic figures. In general terms a slowdown in GDP growth at 1.2% is expected for 2017 (compared to 2.0% for 2016) while the unemployment rate will slightly increase to 5.0% (from 4.9% in 2016).

1. The output gap is, practically, the difference between actual and potential GDP in a country. A positive value means that the real GDP of a country is higher than the potential. The opposite applies with a negative value.

TABLE 1.4.1 The predictions for the main macroeconomic figures (2017)

	Real GDP (%)				Inflation (%)				Unemployment (%)				Output Gap (%, GDP)			
	AIECE	EC	IMF	OECD	AIECE	EC	IMF	OECD	AIECE	EC	IMF	OECD	AIECE	EC	IMF	OECD
Developed (G4)	-	1.3%*	1.4%	1.6%	-	1.5%*	1.8%	1.9%	-	4.4%*	-	4.9%	-	0.2%**	-0.5%	-1.0%
Eurozone	1.5%	1.5%	1.5%	1.6%	1.2%	1.4%	1.0%	1.2%	9.7%	9.7%	-	9.5%		-0.7%	-0.8%	-1.2%
The EU (other than the Eurozone)	-	2.5%	2.5%	-	-	1.5%	1.5%	-	-	6.3%	-	-	-	0.2%	-	-
Candidates for EU	-	3.2%	2.9%	-	-	2.9%	3.1%	-	-	16.5%	-	-	-	-	-	-
Developing economies	-	-	4.6%	-	-	-	4.4%	-	-	-	-	-	-	-	-	-
Greece	1.9%	2.7%	2.8%	1.3%	0.0%	1.1%	0.6%	1.1%	22.0%	22.2%	-	23.1%	-3.5%	-7.5%	-	-11.9%
World	3.2%	3.4%	3.4%	-	-	-	-	-	-	-	-	-	-	-	-	-

Source: Association of European Conjecture Institutes (AIECE), European Commission (EC), International Monetary Fund (IMF), Organization of Economic Cooperation and Development (OECD).

Notes:

1. G4: USA, Canada, Japan, UK.
2. The EU (other than the Eurozone): Croatia, Bulgaria, Denmark, Czech Republic, UK, Hungary, Poland, Romania, Sweden.
3. Candidates for EU: FYROM, Montenegro, Serbia, Turkey, Albania.

* Without Canada, ** without Canada and Japan.

A remarkable increase of the inflationary pressure, from 0.6% in 2016 to 2.4% in 2017, is also expected. Finally, as regards to the output gap, there will also be a slight rise from -0.5% to -0.8%.

1.4.3. The Eurozone

Based on the macroeconomic outlook, in Table 1.4.1, the economic growth in the Eurozone is expected to move with a (moderate) average rate of around 1.5%-1.6% in 2017. This growth will mainly derive from the aggregate demand and will be supported by the growth of employment. Concerning now the output gap of the Eurozone, it is expected to present negative values spanning from -0.7% to -1.2% with variations from country to country and with the Greek economy as a special case (outlier). This evidence indirectly signals the existence of some idle aggregate demand and therefore adequate room for further improvement of economic growth. However a drawback, concerning these output gap expectations, can be attributed to the demographic problem of the Eurozone and also to relatively weak productivity, compared with the pre-crisis period.

Regarding now the inflation rate, after a period of almost zero-level inflation (0.3% for 2016), the expectations for 2017 are for an increase of around 1.0% to 1.4%, due to the gradual increase of energy prices internationally. Concerning now the labour market and the unemployment rate, there are some signs of improvement on both the level of employment and on the gradual reduction of the unemployment rate. More analytically, according to the OECD recent estimations (2016), the employment rate is expected to continue rising at an annual average rate of 1% while the unemployment rate is also expected to move around 9.5% to 9.7%. However, although both macroeconomic figures are considered as improved, relative to 2016, the rate of improvement is rather slow.

Special importance for our country –as a member of the Eurozone– should be attributed to the components contribution for the GDP growth.[2] So, based on the individual components of the Eurozone's GDP (European Commission, Autumn 2016), we observe the dominant role of private consumption for the years 2017-2018. Actually, its contribution to the percentage change of the Eurozone's GDP is expected to be around 0.8-0.9 (i.e. which implies a 45% participation in the growth of 2017). The contribution of investment follows next with around 0.6-0.7 of the percentage change of GDP (i.e. a 35% participation of the GDP growth for 2017), without neglecting the positive role of public consumption in this economic growth. The only negative factor of contribution to the percentage change of GDP seems to be the net exports (-0.1 annually, for the period under consideration). Additional elements of uncertainty regarding future economic growth can be both the relatively high non-performing loans (NPLs) of the Eurozone and the banks' low profitability accompanied with high operational costs. These elements are drawbacks for any future credit expansion. Concerning now the Eurozones' Balance of Payments (BoP), we can say that, for 2017, it is expected to remain on surplus with the rest of the world (3.5% of the total Eurozone GDP), although this surplus will gradually diminish.

1.4.4. The EU (outside the Eurozone)

With this term we refer to those countries that for the time being do not share the common euro currency but belong to the European Union (EU).[3] Of course, these countries are not considered as homogeneous since they belong to different economic and political categories. In simple words, we have the countries of the former Eastern bloc, which are trying to fulfill gradually the requirements for accession to the euro (see Croatia, Bulgaria, the Czech Republic, Hungary, Poland and Romania) and countries who choose to abstain, for the time being, from the euro (see Denmark and Sweden). Finally, the UK is a different case and, therefore, is discussed in the section of developed economies (G4).

Regarding now the first category of countries (i.e. the former Eastern bloc), it is important to mention that, with the exception of Romania and Poland, we expect an almost common GDP growth for 2017 of around 2.6%-2.9%. The other two countries in this category are expected to have higher GDP growth rates (between 3.9% and 3.4%, respectively). At the unemployment rate issue, however, things diverge further in this group of countries. More analytically, Croatia will possibly remain at a double-digit unemployment rate for 2017 (11.7%) compared to 13.4% in 2016, while the rest of this group of countries will move with one-digit figures, ranging from 7.1% (Bulgaria) to 4.1% (Czech Republic). On the other hand, in the developed economies of the group, due to their independent monetary policy, a satisfactory GDP growth rate is expected for 2017 for both (1.7% and 2.4% for Denmark and Swe-

2. We mean the basic components of GDP: private consumption, public consumption, Investment and net exports.

3. We mean the countries: Croatia, Bulgaria, Denmark, the Czech Republic, the UK, Hungary, Poland, Romania and Sweden.

den, respectively). A relatively low level of unemployment is also expected in these two developed economies, with levels lower than 6.5% for Sweden and 5.3% for Denmark.

1.4.5. Candidate countries for accession to the EU[4]

A very interesting element of this group of countries is that it primarily covers the Balkan Peninsula. It is also noticeable that, as illustrated in Table 1.4.1, the group faces high unemployment rates (16.5% on average) but also high growth rates (3.0% on average).

In our analysis an important role should be attributed to the economy of Turkey, due not only to the size but also due to the recent political events that have affected the country. Starting from the GDP growth rate, a percentage of around 3.0%-3.3% is expected for 2017. This growth rate could have been even higher without the Syrian crisis on the borders of the country, the bomb explosions and the recent failed coup (July 2016). The main driving macroeconomic factor of Turkey's GDP growth rate is expected to be private consumption. An important role should also be attributed to public consumption. On the other hand, a drawback of Turkey's economy is its BoP deficit. Additionally, the unemployment rate of the country is expected to increase slightly to 11.0%. Regarding now the inflation rate, it will probably stay at the level of 2016 (8.0%), which is the highest of this (regional) group. Concerning the issue of the output gap of Turkey, it is expected that it will be slightly higher than the corresponding level of 2016, approaching -4.5%.

In the case of Serbia, the GDP growth rate is expected to be around 3.0% in 2017. As in the case of Turkey, the main driving macroeconomic factor of the GDP growth rate of the country will be private consumption. The unemployment rate will stay at rather high levels reaching almost 15.6%. Finally, the inflation rate is expected to move higher, relative to 2016, and, more specifically, will reach 2.4%-3.2%.[5]

Albania, Montenegro and FYROM are the smallest countries of this (regional) group. Their GDP growth rate is expected to be relatively uniform and, more specifically, will be around 3.2%-3.5%. On the other hand, the unemployment rate in this group of countries is expected to remain at very high levels, ranging from 15.2% (Albania) up to 23.2% (FYROM). Regarding the inflation rate, figures will rather be much more controllable than that of the unemployment rate, ranging from 0.9% (FYROM) up to 2.3% (Albania).

1.4.6. Developing economies[6]

The emerging and developing economies are expected, first, to have a slightly higher GDP growth rate compared to 2016 and, second, to remain the group of countries with the highest growth rate, according to Table 1.4.1. More specifically, an average increase in the GDP growth rate of 4.6% is expected for 2017 (from 4.2% in 2016). Additionally, a high average inflation rate is also expected in this group of countries (4.4% for 2017). However, a high variation of the inflation rate from country to country is rather expected in the group. As regards to the output gap, this will remain, on average, with some negative value. This signals the existence of a weak aggregate demand and leaves some room for higher growth rate margins. Of course there is a strong differentiation concerning the output gap, from country to country, on these developed economies.

Next, we will briefly report on the expectations regarding the main macroeconomic variables of the major countries of this group, including China, Brazil, Russia and India.

Starting from China, we can say that, in 2017, it is expected to grow with a rate of 6.0% to 6.2%. On the other hand, the inflation rate will increase slightly at 3.0%.[7] In addition, China's shift to a more consumerist model as well as becoming a services provider is expected to contribute –following a spillover process– to the growth of the other developing economies through its influence on the world and on cross-border trade. On the other hand, there is a concern about the speed of reforms in the country and about the medium-term "financial risk" associated with its high corporate debts.

On the other hand, Brazil remains in recession, though its GDP growth looks to be improving, which implies that in 2017 the country will possibly be out of recession. More specifically, while for 2016 the recession

4. We mean the countries: FYROM, Montenegro, Serbia, Turkey, Albania.

5. No data exists for the output gap of Serbia, FYROM, Montenegro and Albania.

6. The specific group of countries is the most populous and, as the IMF report describes, it includes five (5) individual groups of States: the Independent States and the States of the Commonwealth, the Emerging Asian countries, the Emerging European countries, the Latin American countries and the Caribbean, and, finally, the Countries of Middle East, N. Africa, Afghanistan, Pakistan and sub-Saharan Africa.

7. No data is available for unemployment forecasts in China or for the output gap.

was estimated to exceed -3.3%, for the current year, either a zero growth (0%) or even a slight recovery (0.5%) is expected. Finally, the inflation rate is estimated to decline from 9.0%, in 2016, to 6.0% or 7.0%,[8] in 2017.

As regards to Russia, we can mention that it demonstrates some signs of stabilization after the 2016 recession. Specifically, as in the case of Brazil, while for 2016 the recession was estimated to reach -0.8%, for the current year a slight recovery (0.8%) is expected. Concerning the unemployment rate, based on the existing data, it will rather remain at the same relatively low level recorded in 2016 (5.7%). Finally, for the case of inflation, a decline from 7.3% in 2016 to 5.2% in 2017[9] is expected.

In the case of India, a high GDP growth rate of around 7.4% to 7.6% is expected, which is similar to the corresponding GDP growth rate of 2016. Also a stable inflation rate of around 5.2%[10] is expected for the country.

1.4.7. Greece

With respect now to our country, starting from 2016, it is eventually expected that either the recession will be eliminated (0.0%) or that even a slight GDP growth of almost a 0.4% will be recorded. On the other hand, for 2017, the expected GDP growth shows significant deviation from Institution to Institution (ranging from 1.3% to 2.8%, see Table 1.4.1). This GDP growth will basically rely on aggregate demand as well as investment activity which, in its turn, will gradually help increase net exports. If such a trend continues in 2018, it will considerably help for a further relaxation of capital controls. As regards to the country's output gap, no converging views exist for 2017. Indeed, as we can observe from Table 1.4.1, the existing estimations vary considerably (from -3.5% up to -11.9%).

Also the Greek labour market (unemployment) shows some signs of improvement. More specifically, the unemployment rate in 2017 is expected to fall further to 23.1% from 23.5% in 2016. Deflation also shows elements of possible termination (with predictions from 0.0% to 1.1% for 2017) mainly due to the increase in indirect taxes (e.g. VAT). However, negative uncertainty is created for the Greek economy due to the issue of the "second evaluation" by the quartet as well as due to the issues related to the refugee crisis and migration.

As regards to the fiscal problems, the reduction by the General Government of the expenditures on interest is expected to lead to a budget deficit limitation of around 2.7% of GDP, in 2016. For 2017 (and 2018) the expected primary budget surplus is estimated to be 1.75% of the GDP (3.5% respectively). Finally, a substantial increase of GDP growth from 2017 onwards, combined with the reduction of fiscal expenditures on interest, is estimated to deliver some positive effects on the debt/GDP ratio and thus to the economy as a whole.

1.4.8. Some international long-term economic policy proposals

Finally, regarding the prospects of the world economy, the international organizations (e.g. IMF, OECD, etc.) usually suggest some long-term policy proposals based on the economic group to which each country belongs. More specifically, there are different proposals for developed, developing and low-income economies. For the first category, they recommended the continuation of a loose monetary policy, which must be accompanied by a coordinated fiscal expansion, provided that these economies exhibit a negative "output gap". If there is a positive or zero "output gap" a fiscal policy that will be committed to grow the potential "output gap" through tax reform and through high-tech investment is proposed. With regard to developing and emerging economies, financial flexibility is primarily recommended in order to tackle the problem of variability of these economies. Finally, as regards to low-income economies, policies that improve labour productivity are proposed (e.g. through training, structural changes, etc.).

8. No data is available for the production gap of Brazil.

9. No data is available for the production gap of Russia.

10. No data is available for unemployment forecasts in India or for the output gap.

2. Public finance

2.1. The State Budget and its evolution during the economic crisis

Elisavet I. Nitsi

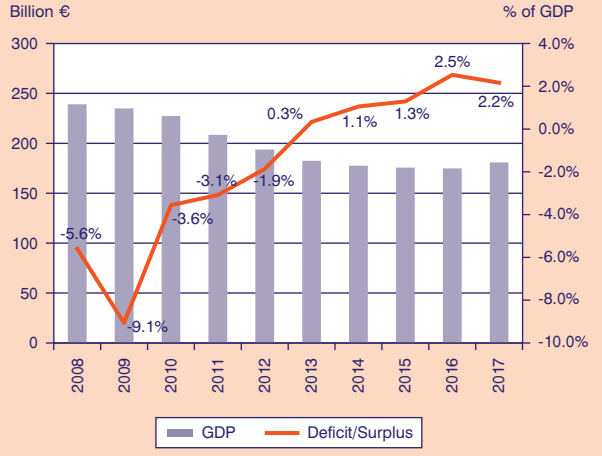
According to the most recent data published by the General Accounting Office,[1] on a modified cash basis, the execution of the 2016 State Budget shows a primary surplus of € 4,437 million or 2.54% of GPD, against € 2,270 million in 2015 (Table 2.1.1). The target set by the Financial Assistance Facility Agreement for a primary surplus of 0.5% of GDP has been met. Achieving the objective set for 2017, that is a primary surplus of 0.75% of GDP, will not be a problem according to the Ministry of Finance, based on the GDP projections and the planned economic policy, which estimates a surplus of € 3,793 million or 2.1% of GDP.

The same table shows the key figures of the State Budget and their evolution in the economic crisis period, i.e. since 2008. The evolution of the deficit/surplus of that period together with the evolution of the GDP is shown in Figure 2.1.1. Throughout the crisis period the GDP has a clear downward trend, with a decrease of 26.9% by 2016, while according to the Ministry of Finance estimates, a growth rate of 2.5% is expected in 2017. The primary deficit of the State Budget reached 9.1% of GDP in 2009 (15.4% was the General Government deficit), the turning point of the Greek economy, which led the country outside of the markets and to the signing of the First Memorandum of Understanding and the First Adjustment Program.

The deficit reduction was rapid, and within four (4) years and two memoranda, the country got out of the primary deficits trap. Primary surpluses sustainability, as seen from the data in Table 2.1.1, was based on: (a) the continuous reduction in the incomes of employees and government retirees; the wage and pensions bill that amounted to € 22,293 million in 2009 is estimated to reach € 12,337 million in 2017, a decrease of 46.1%, (b) the increase in indirect taxes, particularly the years 2016-2017; despite the significant reduction in incomes the increase in 2016 was € 1,907 million, while a further increase of € 763 million is foreseen for 2017, (c) the over-taxation of individuals and legal entities, which is around € 20 billion per year, and (d) the significant reduction in interest paid for the repayment of the loans since 2013 due to the PSI, as well as the agreements for lower interest rates in the context of the country's consolidation program.

Specifically, as shown in Figure 2.1.2, the State Budget revenues were maintained at the same level until 2015, with small variations per year. In 2016 revenues increased due to the significant increase in indirect taxes, and a modest further increase is expected in 2017. The expenditures show a significant reduction until 2014, with a particular decline in the years that the consolidation program included expenditure reduction measures –mainly reduction in wages and pensions in the public sector and operating costs– and relative stabilization in recent years, while an increase in 2017 is expected, mainly due to increased needs for sub-

FIGURE 2.1.1
The Gross Domestic Product (GDP) and the Primary Deficit/Surplus of the Greek State Budget 2008-2017 (in % of GDP and billion €)



Source: State Budget Report, various years. General Accounting Office, *State Budget Execution Monthly Bulletin 2016*, January 2017.

Note: 2017 are estimates of the 2017 State Budget.

1. Data is presented on a modified cash basis as published in the State Budget Execution Bulletin, December 2016, General Accounting Office, Ministry of Finance.

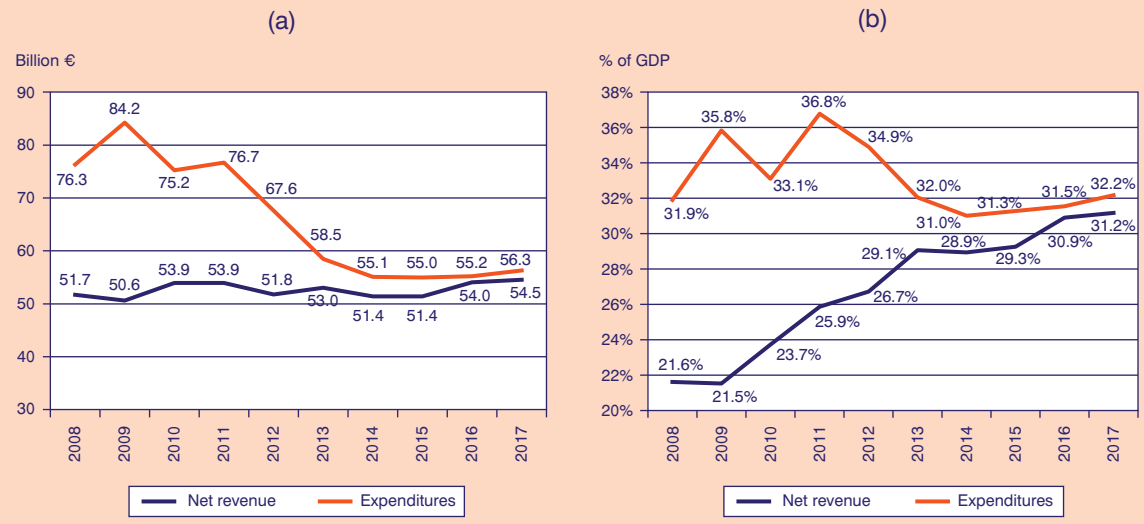
TABLE 2.1.1 State Budgets 2009-2017, million € on modified cash basis

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017[4]
State Budget										
Net Revenue	51,680	50,585	53,929	53,932	51,774	53,018	51,367	51,421	54,038	54,529
Expenditures	76,284	84,215	75,241	76,705	67,613	58,459	55,063	54,951	55,179	56,286
Ordinary Budget										
Net Revenue	51,680	48,545	50,857	50,159	48,173	48,423	46,650	46,589	48,891	50,374
- Recurring Revenue	55,334	52,307	54,381	52,308	49,661	47,170	47,819	47,432	52,214	51,001
Direct taxes	20,863	21,431	20,224	20,318	21,096	20,065	20,464	19,758	21,839	20,415
Indirect taxes	30,222	28,293	31,042	28,632	26,083	24,548	23,776	23,773	25,680	26,443
Drawings From E,U,	579	264	320	274	246	183	196	428	415	523
Other Non-Tax Revenue	3,670	2,319	2,795	3,083	2,237	2,374	3,383	3,472	4,280	3,620
- Non-Recurring Revenue	-	1,190	1,797	1,977	1,517	4,272	1,817	1,825	804	273
- Privatization proceeds[1]	-	-	-	1,157	-	86	384	254	106	3,289
- Tax Refunds	3,654	4,952	5,322	5,283	3,172	3,105	3,370	2,922	3,263	2,044
Expenditure	61,642	74,627	66,787	70,145	61,499	51,809	48,472	48,545	48,865	49,536
- Primary Expenditure	50,435	57,992	52,180	51,561	47,529	44,230	41,928	41,298	42,253	43,986
Salaries & Pensions	22,871	22,293	20,309	20,328	20,511	18,422	18,487	16,479	16,174	12,337
Grants to Social Security Sector	13,447	21,146	17,485	19,119	17,134	15,922	14,421	14,714	15,630	20,210
Operational and Other Expenditures	8,783	9,275	8,066	7,022	6,410	6,337	5,733	5,438	5,309	5,754
Earmarked Revenues	4,624	6,766	6,752	5,578	3,474	3,548	3,295	2,787	3,248	3,119
- Net Interest Expenditure	11,207	12,325	13,223	16,348	12,224	6,044	5,569	5,800	5,577	5,550
Public Investment Budget										
Revenues	5,018	2,040	3,072	3,773	3,601	4,595	4,717	4,832	4,178	4,155
Expenditures	9,624	9,588	8,454	6,559	6,114	6,650	6,592	6,406	6,288	6,750
State Budget Primary Balance[2]	-13,397	-21,305	-8,089	-6,425	-3,616	603	1,872	2,270	4,437	3,793
State Budget Balance	-24,604	-33,630	-21,312	-22,773	-15,832	-5,441	-3,697	-3,530	-1,140	-1,757
GDP[3]	239,141	235,035	227,318	208,532	193,749	182,438	177,559	175,697	174,908	180,817

Source: State Budget Report, various years. General Accounting Office, *State Budget Execution Monthly Bulletin 2016*, January 2017.

Notes: 1. 2011 refer to revenues from licenses and public rights assignment. 2. Deficit (–)/Surplus (+). 3. The 2016 data for GDP are estimated. 4. The 2017 data are estimated.

FIGURE 2.1.2
State Budget's net Revenues and Expenditures 2008-2017 (in % of GDP and in billion €)



Source: State Budget Report, various years. General Accounting Office, *State Budget Execution Monthly Bulletin 2016*, January 2017.

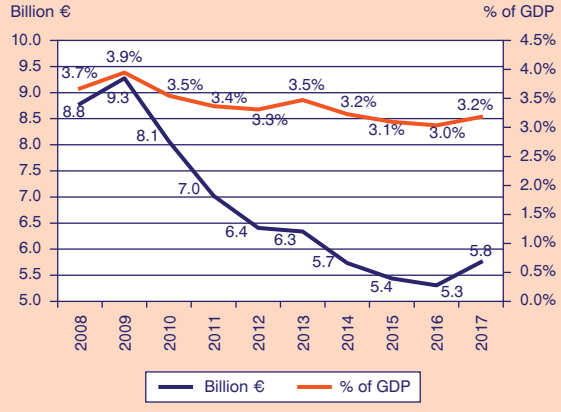
Note: 2017 are estimates of the 2017 State Budget.

sidies to the Unified Social Security Fund amounting to € 15,989 million. It should be noted that although the expenditure in absolute levels has fallen by 34.5% since 2009 (Figure 2.1.2a), when the country entered the consolidation program to ensure the continuation of its lending, the discussions with the institutions have been in terms of expenditure as a percentage of GDP, as a comparable measure. Thus, the expenditure reduction in this period is only 4.3% of GDP, given that GDP has fallen by 25.6% from 2009 (Figure 2.1.2b).

The same holds for the widely targeted, domestically and abroad, operational costs. As illustrated in Figure 2.1.3, from the peak level in 2010, which reached € 9,275 million, it fell in 2016 to € 5,309 million, a decrease of 42.8%. In terms of GDP, however, reduction seems to be only 0.7%.

The Ministry of Finance for 2017 foresees that the State Budget will range around the same level as in 2016. It should, however, be clear that this will depend on the continuation of the program agreed upon in the Financial Assistance Facility Agreement, and thus in closing the second assessment. The agreement delay will result, as many times before, in legislating even more measures that will be more difficult for the Greek economy and the Greek people, as the time of the delay without funding the basic State functions, as the settlement of General Government arrears, means the further decline of the economy due to reduced liquidity, but also a loss in confidence by both Greek and foreign investors, will lead to the further deterioration of the economy.

FIGURE 2.1.3
State Budget operational and other expenditures 2008-2017 (in % of GDP and in billion €)



Source: State Budget Report, various years. General Accounting Office, *State Budget Execution Monthly Bulletin 2016*, January 2017.

Note: 2017 are estimates of the 2017 State Budget.

The agreement with the creditors is a one-way road, as financing the expenditures by increasing revenue or redirecting expenditures is not possible. Any attempt to further increase revenue by raising taxes, direct and/or indirect, may not bring positive results, given the significant reduction in the ability of Greeks to pay taxes. They should aim at increasing the tax base, as this can only increase the taxable income and, thus, the state revenues. This is a discussion that has taken place for many years, but the efforts will have to step up in this direction, by strengthening the control mechanism with significant staff recruitment and improving the legal framework for fines and speeding up judicial decisions.

Finally, from the data examined and related to State expenditures in general, and in particular the operational expenditures, it is clear that their further reduction, if not very well targeted, will lead to dysfunction of the public entities. The government spending review that started from selected ministries in 2016, i.e. Ministry of Finance, Economy and Development and Culture and Sport, and is expected to expand throughout the General Government in 2017, can be a tool, if it is not solely driven in reducing expenditures by a certain percentage, but the optimal redistribution of expenditure based on the criteria of economic efficiency and social justice, with the ultimate purpose to help improve the country's growth potential in the medium term.

2.2. Evolution and structure of public debt

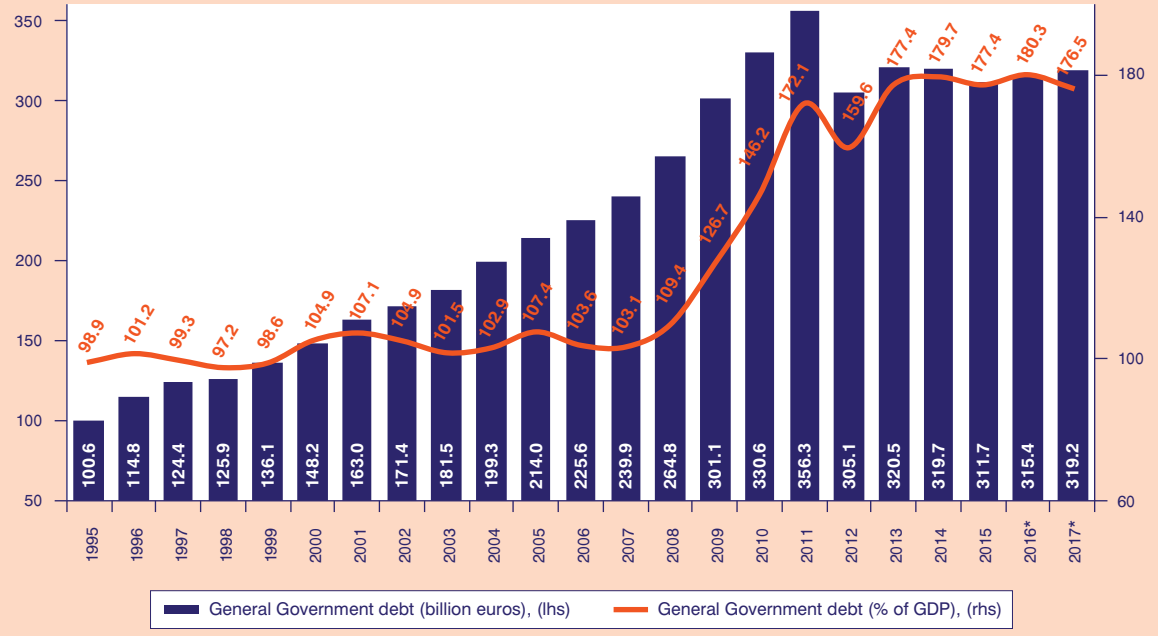
Christos Triantopoulos

The level and the structure of public debt in 2016 was affected by the fiscal performance, while the discussions about the short-term measures that can strengthen long-term sustainability are open in the framework of the support mechanism. In general government terms, according to the 2017 Budget, public debt in 2016 is estimated to € 315,400 million (180.3% of GDP) from € 311,673 million (177.4% of GDP) in 2015 and € 319,729 million (179.7% of GDP) in 2014. So, in current prices (as a result of the return of € 10.9 billion from the Hellenic Financial Stability Fund [HFSF] to the European Financial Stability Facility [EFSF]), in 2016 the level of public debt was lower compared to 2014, while in GDP terms (as a result of the reduction of the nominal GDP) public debt as a share of GDP reached its highest level, over 180% of GDP. However, in 2017 public debt as a share of GDP is expected to be lower as a result of the recovery of the economy and to reach 176.5% of GDP, while, in current prices, its increasing trend will continue as the general government fiscal deficit remains in place. So, in 2017 public debt is expected to reach € 319,000 million (Figure 2.2.1).

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 is estimated, according to the 2017 Budget, at € 326.6 billion (186.7% of GDP) in 2016. Whilst, until November 2016, central government debt stood at around € 325 billion, increased by € 3.7 billion compared to 2015. Concerning the structure of the central government debt, as shown in the data of the January-November 2016 period, the largest share consists of loans under the support mechanism, which increased compared to 2015 by about € 7.5 billion, reaching € 227.9 billion (Table 2.2.1). This source of funding covers 70% 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 € 56.7 billion in November 2016 (from € 59.8 billion in 2015), representing 17.5% of the central government debt.

Furthermore, the central government funding from treasury bills remained constant at € 14.8 billion. In parallel, short-term loans through the scheme of repo agree-

FIGURE 2.2.1
General Government debt, 1995-2017



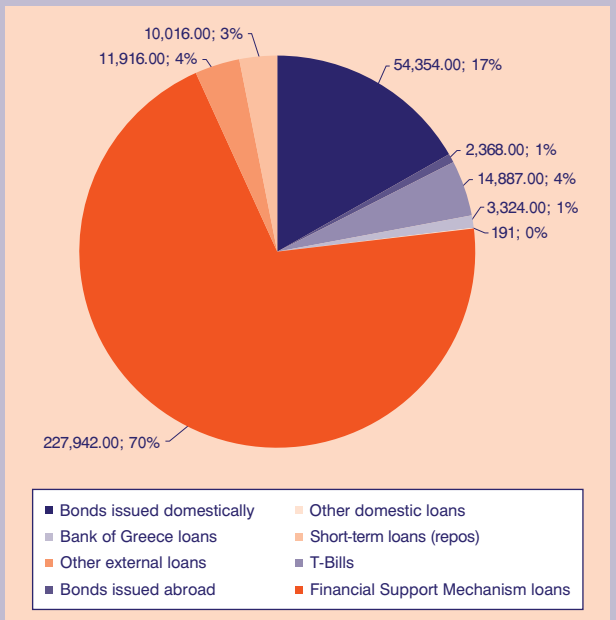
Source: European Commission (2016) and Budget 2017 (2016).

Note: *Estimations.

ments with general government entities decreased during the last months of 2016, even though, according to the 2017 Budget, total funding from the repos scheme would reach € 12 billion by the end of the year. In particular, short-term loans by the central government through repos decreased in November 2016 to € 10 billion from € 11.9 billion in August 2016, constituting 3% of the central government debt (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 September 2016 (as in the latest period), most of the debt is non-tradable (77.8%) and at a floating interest rate (69.8%), presenting (in both cases) a small increase and 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 support mechanism, which is based on non-tradable and floating rate loans. Also, developments in funding from the support mechanism in 2015 and 2016 (i.e. no IMF participation) also affected the currency's share in which the central government debt is expressed; as a result, in September 2016, 96.9% of this debt was expressed in euro, against 96.5% in December 2015 and 95.9% in December 2013 (Table 2.2.2).

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



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

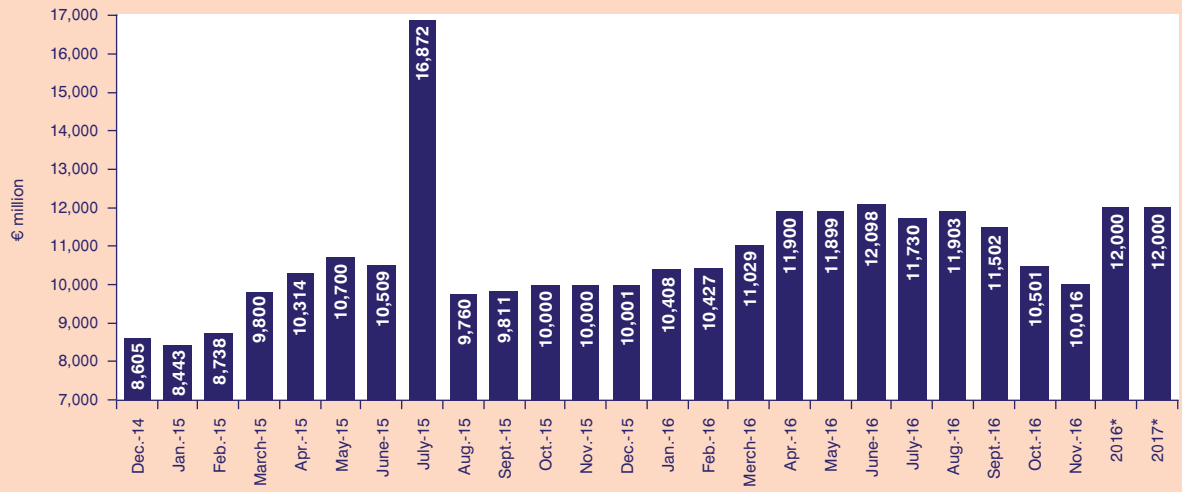
TABLE 2.2.1 Structure of Central Government debt

	2011		2013		2015		November 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**	**56,722.00**	**17.5**
Bonds issued domestically	240,940.37	65.5	73,415.28	22.8	57,112.00	17.8	54,354.00	16.7
Bonds issued abroad*	18,833.81	5.1	2,880.97	0.9	2,706.00	0.8	2,368.00	0.7
B. T-Bills	**15,058.63**	**4.1**	**14,970.82**	**4.7**	**14,880.00**	**4.6**	**14,887.00**	**4.6**
C. Loans	**93,145.19**	**25.3**	**230,210.90**	**71.6**	**236,633.00**	**73.6**	**243,372.00**	**74.9**
Bank of Greece	5,683.99	1.5	4,734.61	1.5	3,792.00	1.2	3,324.00	1.0
Other domestic loans	836.71	0.2	115.50	0.0	110.00	0.0	191.00	0.1
Financial Support Mechanism loans	73,210,36	19.9	213,152.48	66.3	220,431.00	68.6	227,942.00	70.1
Other external loans**	13,414.13	3.6	12,208.31	3.8	12,300.00	3.8	11,916.00	3.7
D. Short-term loans* **	**0.00**	**0.0**	**0.00**	**0.0**	**10,001.00**	**3.1**	**10,016.00**	**3.1**
Total (A+B+C+D)	**367,978.00**	**100.0**	**321,477.97**	**100.0**	**321,332.00**	**100.0**	**324,997.00**	**100.0**

Source: Public Debt Bulletin (December 2011, December 2013) and General government Bulletin (November 2016).

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

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



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

Note: The performance of July 2015 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

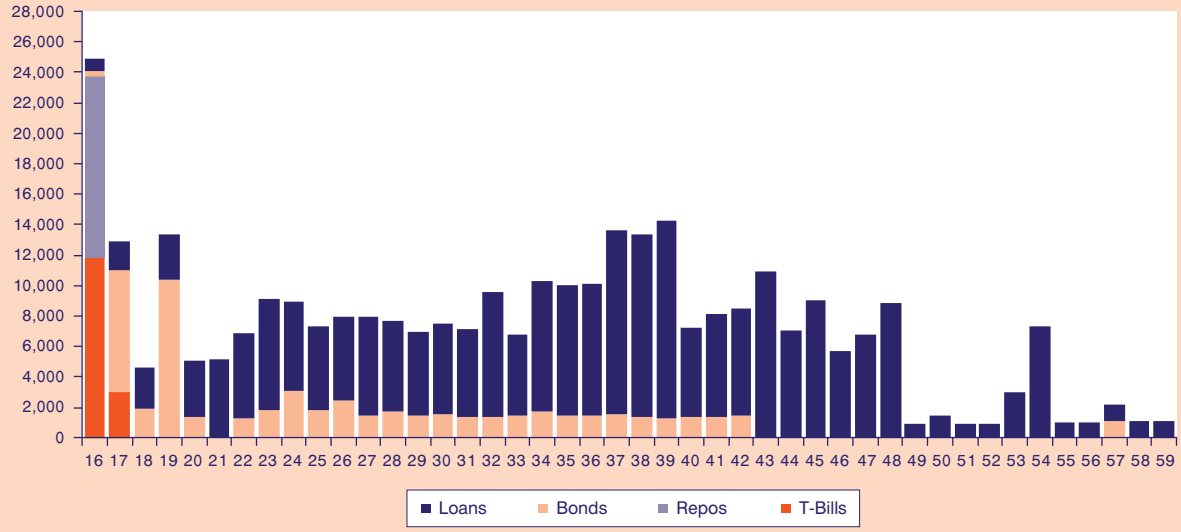
	December 2011	December 2012	December 2013	December 2015	December 2016
A. Rate					
Fixed rate[1]	62.0%	32.7%	28.5%	30.9%	30.2%
Floating rate[1, 2]	38.0%	67.3%	71.5%	69.1%	69.8%
B. Trade					
Tradable	74.7%	34.3%	28.4%	23.2%	22.2%
Non-tradable	25.3%	65.7%	71.6%	76.8%	77.8%
Γ. Currency					
Euro	97.5%	96.7%	95.9%	96.5%	96.9%
Non-Euro area currencies	2.5%	3.3%	4.1%	3.5%	3.1%

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

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

The long-term situation of the public debt will be significantly affected by the measures promoted in the framework of the support mechanism in order to strengthen public debt's sustainability. These measures, inter alia, focus on the improvement of the debt portfolio and the smoothing of the maturity throughout the next decades (Figure 2.2.4) and the enhancement of the public debt against the interest rate risk (because of the large share of debt in the floating rate regime), contributing –after the 2012 large dual debt restructure– to the strengthening of the debt's long-term sustainability.

FIGURE 2.2.4
Maturity profile of Central Government Debt (€ million)



Source: Budget 2017 (2016).

3. Human resources and social policies

3.1. Recent developments in key labour market variables

Ioannis Cholezas

3.1.1. Introduction

Both Labour Force Surveys (LFS) conducted by ELSTAT and reports on paid employment published by the information system ERGANI provide the necessary data for this article. In the third quarter of 2016 the labour market continued to perform better, a process that started in 2014. In particular, the unemployment rate dropped below 23%, which is lower compared both to the previous quarter and to the third quarter of 2015. Employment, on the other hand, increased by 34.1 thousand persons compared to the second quarter and by 65.6 thousand persons compared to the third quarter of 2015. The quality of increased employment, though, is a bit problematic, since new jobs are often flexible, i.e. they involve part-time and work-in-shifts job contracts, and it is quite common to convert full-time job contracts to flexible job contracts. Adding to the equation a number of subsidised jobs offered under active labour market programmes makes the overall state of the labour market less clear. Last but not least, the weak connection of private consumption with increased employment and decreased unemployment recorded lately can partly be explained by the changes in employment caused by the crisis and the emigration of the labour force.

3.1.2. Unemployment

In the third quarter of 2016 the general unemployment rate decreased further to 22.6% of the labour force, half a percentage point (pp) lower than the second quarter and 1.4pp lower than the third quarter of 2015 (65.6 thousand fewer unemployed). Compared to the third quarter of 2013 (2013c), when the largest unemployment rate was recorded, the decrease equals 4.6pp or, in other words, 227.7 thousand fewer unemployed.[1] It should be noted, though, that on a year-on-year basis the decrease was smaller compared to the past two years, which is true for the second quarter as well. This is probably a sign that the decrease in unemployment is slowing down, due to fatigue or disenchantment.[2]

Some groups continued to have worse prospects in the labour market, as shown in Graph 3.1.1. Women faced an unemployment rate of 27.2%, which is higher than the respective rate for men (18.9%). The y-o-y decrease in unemployment was twice as high for men (-1.8pp vs. 0.9pp) and it is also larger compared to the highest levels in 2013 (-5.1pp vs. -4.1pp). The number of unemployed men decreased faster than the number of unemployed women. That is true both compared to the situation in 2013 (153.3 thousand fewer unemployed men vs. 74.4 thousand fewer unemployed women) and compared to the previous year (49.3 thousand fewer unemployed men vs. 18.6 thousand fewer unemployed women). An interesting fact, although unfavourable for women and the labour market in general, is that the gender unemployment differential widened, reaching the highest level since 2008, despite the short-lived contraction that was recorded in the preceding two years (7.3pp in 2013c, 6.6pp in 2014c, 7.4pp in 2015c, 8.3pp in 2016c). That does not mean, of course, that the differential will not shrink again in the future, but it does make one wonder about its causes.[3]

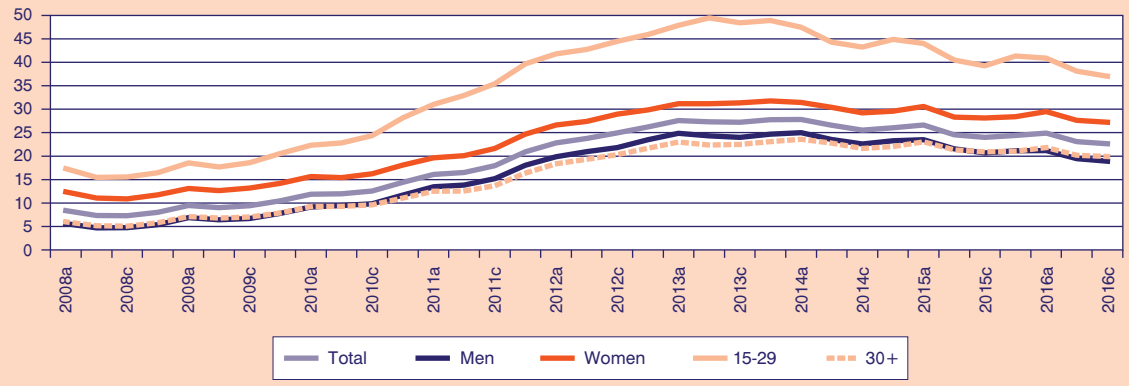
Traditionally, youth, i.e. persons aged 15-29, also face higher unemployment rates compared to persons over 30. In the third quarter of 2016 the youth unemployment rate was 37%, while for persons over 30 (30+) it was approximately 20%. The unemployment rate for youth, though, declined faster on a y-o-y basis: compared to 2015 the unemployment rate was 2.2pp lower (vs. only 1pp for persons 30+), while compared to 2013 the unemployment rate was lower by 11.4pp (vs. only 2.6pp for persons 30+). Nevertheless, it should be stressed that the youth unemployment rate in-

1. The highest unemployment rate since 2008 was recorded in the first quarter of 2014. Nevertheless, due to the intense seasonal variation of unemployment, it is preferred to compare it to the respective quarter of previous years.

2. Economic uncertainty rising again these days is an important ingredient in a firm's decision process.

3. Theoretically, firms wish to employ the most productive candidates. Due to stereotypes amongst employers, women are often considered less productive compared to men.

GRAPH 3.1.1
Unemployment rate per sex and age group



Source: Labour Force Surveys, ELSTAT, KEPE processing.

creased faster during the crisis. In particular, from the third quarter of 2008 until the third quarter of 2013, the youth unemployment rate increased by 32.9pp, while for persons over 30 it increased by 17.4pp. Therefore, the fastest decrease in the youth unemployment rate is no surprise, especially when one considers the implementation of active labour market programmes targeting youth and their stronger willingness to take up flexible jobs, which continue to expand.

The expansion of flexible types of jobs referred to above could be responsible for the narrowing of the unemployment differential between youth and persons over 30 along with the general unemployment rate drop and contrary to the evolution of the gender unemployment differential previously mentioned. In particular, the age unemployment differential was as high as 17.1pp in the third quarter of 2016 (note that it reached 25.9pp in 2013c) converging to the 2010c level. These changes are also reflected in the number of the unemployed. Unemployed youth decreased in 2013c-2016c by 140.7 thousand, while the unemployed over 30 decreased by 87.1 thousand. Interestingly, combining gender and age movements reveals that the age differential is due to the significant hysteresis in the decrease of unemployed women over 30 during the same period: they decreased by merely 14.3 thousand persons. Consequently, approximately 83% of the decrease in the unemployed over 30 is fuelled by men.

The intriguing fact that should be pointed out is the heterogeneity amongst youth, which could be a result of other personal attributes, e.g. education. Specifically, persons aged 15-19 faced the highest unemployment rate in 2016c (49.1%) compared to both age group 20-24 (43.4%) and age group 25-29 (33.2%). The divergence of 15pp is probably too large to consider a group homogeneous. Differences are even more pronounced if one takes into account the evolution of unemployment on a y-o-y basis, since amongst youth 15-19 the unemployment rate dropped by 9pp vs. 4.4pp for age group 20-24 and 1.1pp for age group 25-29. Note that the situation is similar even if one goes back to the third quarter of 2013, when the highest unemployment rates were recorded. All in all, it seems that the decrease in the unemployment rate has little to do with youth 25-29 and probably even less with tertiary education graduates who can hardly be younger than 23.

Except for different unemployment probabilities, the evolution of unemployment differs amongst population groups as shown in Table 3.1.1. The highest unemployment rates for the general population, men and persons over 30 were recorded in 2014a, for women in 2013d and for youth in 2013b. Moreover, the decrease since then is stronger for the latter (see last column in Table 3.1.1) and men and much weaker for persons over 30. Nevertheless, note that the latter have exhibited the smallest increase since the third quarter of 2008 (see the second to the last column in Table 3.1.1). On the contrary, youth saw their unemployment rate triple during the crisis.

Large differences in unemployment rates with respect to the level of education attained that were pointed out in previous issues of *Greek Economic Outlook* continue to exist. Persons who hold a PhD and/or Master's degree were faced with an unemployment rate of 11.5% in the third quarter of 2016, while lower secondary education (gymnasium) graduates were faced with an unemployment rate of 24.9%. In between lay all other educational groups with similar unemployment rates, above 23%, with the exception of university graduates (AEI), who were faced with an unemployment rate of 18.1%. It is interesting that on a y-o-y basis (2015c-2016c) the

TABLE 3.1.1 Unemployment per gender and age group and changes over time

	2008c (%)	MXM (%)	2016c (%)	2008c-MXM (pp)	MXM-2016c (pp)
Total	7.3	27.8	22.6	20.5	-5.2
Men	4.7	25.0	18.9	20.2	-6.1
Women	10.9	31.7	27.2	20.9	-4.6
Age: 15-29	15.5	49.5	37.0	33.9	-12.5
Age: 30+	5.1	23.6	19.9	18.5	-3.7

Source: Labour Force Surveys, ELSTAT, KEPE processing.
Note: MXM= maximum rate of unemployment.

largest decrease in unemployment is recorded for gymnasium graduates (-2.2pp) and the smallest for upper secondary (lyceum) graduates (-0.8pp). Unemployment increased only for primary education graduates, although marginally (0.7pp). Lyceum graduates are the largest group of the unemployed (39% of total) followed by graduates of upper technical vocational education (21% of total). The latter group records the second largest decrease in unemployment since 2013 (-6.9pp), slightly smaller than gymnasium graduates (-7.2pp). The reduction in unemployment amongst holders of PhD and/or Master's degree is also noteworthy.

The point made earlier regarding the performance of persons aged 25-29 seems to be validated and further fine tuned by the data on the unemployed per level of education attained. Specifically, despite the fact that over the past year unemployment has decreased for tertiary education graduates, since the third quarter of 2013 and up until the third quarter of 2016, university graduates saw their unemployment prospects improve by a mere 0.9pp vs. 4.6pp for the general population, 4.7pp for holders of PhD and/or Master's degree and 6.9pp for upper technical vocational education graduates. Therefore, it seems that the reduction in unemployment does not concern university graduates much.[4]

During the crisis (2008-2016) the regions of West Greece, Epirus, Central Greece, East Macedonia and Thrace had higher unemployment rates, while islands, like Crete and the Northern Aegean region, had the lowest (see last column in Table 3.1.2). It appears that in regions with traditionally high unemployment rates, the increase in unemployment to the maximum point was faster, with exceptions of course. For instance, the strongest increase in the unemployment rate in 2008-2016 was recorded in Attica (column VI), while in some regions the highest point of the circle, spotted in 2013 in eight out of thirteen regions, was delayed for a couple of years (e.g. Ionian Islands and Thessaly). On the other hand, in Attica the unemployment rate has decreased the most since 2013 (column V). In the following Box 1, the relationship between the size of unemployment and the changes that took place per region during the crisis is examined.

In the third quarter of 2016 West Macedonia (29.8%) and West Greece (29.2%) exhibited the highest unemployment rates. On the other hand, the lowest unemployment rates were recorded in the South Aegean (13%) and the Ionian islands (12.1%). These two regions seem to be doing well during the crisis, since they always lay somewhere in the middle of the unemployment distribution. Moreover, based on the unemployment decrease since the highest rate and up to 2016 (column V), it is interesting to point out the regions which exhibited the fastest de-escalation. These regions include the Ionian islands, Central Macedonia and Attica. On the other hand, when examining the period of unemployment increase, it would be wise to focus on regions that performed poorly, such as West Greece, where the de-escalation is yet to begin, and West Macedonia, where the initially strong increase in unemployment was not accompanied by an equally strong decrease, unlike Central Macedonia and Attica. Last but not least, the increase in the unemployment rate over the past year (2015c-2016c) in regions with strong tourism, e.g. the North and South Aegean islands, should not be underplayed. After all, these are the only two regions, along with West Greece, which have been faced with increasing unemployment over the past year. Perhaps the refugee crisis had something to do with it.

4. Note that university graduates initially had much lower unemployment rates and, despite the increase during the crisis, they still have a long way to go before converging to the higher unemployment rates faced by lower education level graduates.

BOX 1

Evolution of unemployment per region

Regions were ranked from the lowest to the highest unemployment rate every year (ascending order). Next, the average rank was calculated for each region in 2008-2016 (rank I). Moreover, two more ranks were constructed. The first one involves ranking the regions based on the change of unemployment from 2008 until the maximum point (i.e. highest unemployment rate, usually in 2013) in an ascending order (rank II). The second one involves ranking the regions based on the change of unemployment from the maximum point (usually in 2013) until the third quarter (absolute change) in an ascending order (rank III). Finally, two correlation coefficients were calculated. The first one represents the correlation between ranks I and II and the second one represents the correlation between ranks I and III. Substantially, the correlation coefficients estimate how the average unemployment rate (calculated across the entire period 2008-2016) is linked to unemployment changes, which initially increases and then decreases.

The first correlation coefficient is negative (-0.05). This means that regions with low unemployment rates exhibited a larger increase in unemployment. Therefore, regions with already high unemployment rates were hurt proportionately less severely by the crisis. The second correlation coefficient is positive and three times bigger (0.15), which means that regions with low unemployment rates exhibited a slower reduction in unemployment. At first sight the results seem to make sense as it appears that regions with high unemployment rates exhausted their upward movement boundaries quickly, while during the decrease in unemployment that followed they converge faster (perhaps due to the larger distance separating from the natural unemployment rate).

TABLE 3.1.2 Unemployment rate and evolution over time

	2008 (I)	MXM (II)	2016 (III)	2008-MXM (IV)	MXM-2016 (V)	Rank (VI)
East Macedonia and Thrace[1]	8.8	26.8	22.7	17.9	-4.1	4
Central Macedonia[1]	8.4	30.2	24.5	21.7	-5.7	3
West Macedonia[1]	12.5	31.6	31.3	19.1	-0.3	1
Epirus[1]	9.9	27.3	24.4	17.5	-3.0	2
Thessaly[3]	8.3	26.9	25.8	18.6	-1.1	11
Ionian Islands[2]	8.3	21.4	14.3	13.1	-7.1	7
West Greece[4]	9.9	30.1	30.1	20.3	-	8
Sterea Greece[1]	8.5	28.2	25.5	19.7	-2.7	6
Attica[1]	6.7	28.7	22.9	22.0	-5.8	9
Peloponnese[2]	7.0	23.4	19.3	16.4	-4.1	10
North Aegean[2]	4.7	22.4	17.9	17.6	-4.5	13
South Aegean[1]	8.3	21.3	17.5	13.0	-3.8	5
Crete[1]	6.4	24.9	22.6	18.5	-2.3	12

Source: Labour Force Surveys, ELSTAT, KEPE processing.

Notes: MXM= maximum unemployment rate, 1= maximum in 2013, 2= maximum in 2014, 3= maximum in 2015, 4= maximum in 2016, Rank= ranking (from maximum to minimum for the entire period 2008-2016). The ranking was calculated based on each region's place on the distribution of the unemployment rate annually. The region with the biggest sum of rankings has the lowest unemployment rate in period 2008-2016.

3.1.3. Employment

Contrary to unemployment, employment in the third quarter of 2016 increased. The rate of the employed aged 15+ increased by 1pp on a y-o-y basis, which equals 65.6 thousand more employed. Compared to the second quarter of 2016, employed persons increased by 34.1 thousand. Note that in the respective period in 2015 the increase was 84.2 thousand persons, despite the fact that the summer of 2015 was stigmatised by

the temporary closing of banks and the introduction of capital controls. In this framework it comes as no surprise that the employment rate increased on a y-o-y basis from 39.7% (2015c) to 40.6% (2016c).

Men seem to be preferred by employers, since the number of employed men increased faster than the number of employed women: 61.4% of the increase in employed persons involves men. This observation is in accordance with the fact that the unemployment rate for men dropped faster than for women, as already mentioned in the previous section. Moreover, men continued to have a higher employment rate than women (48.7% vs. 33%), while the annual increase since 2015 is bigger for men also (1.1pp vs. 0.7pp).

The age composition of the employment increase is interesting. In particular, the number of the employed aged 15-29 decreased by 11 thousand persons over the past year. A careful look at various age groups reveals that the employed in the age group 25-29 decreased (-18.3 thousand), while age group 20-24, but especially group 15-19, both exhibit an increase in employed persons (1.9 thousand and 5.4 thousand, respectively). As already mentioned, at the same time, unemployed youth decreased, especially for those in age group 25-29. Both phenomena seem at first inconsistent, but that is not necessarily true. A possible explanation is exiting the labour market due to discouragement for two reasons: first, youth stop seeking employment and, thus, become economically inactive and, second, they look for a job abroad, i.e. emigrate.

The increase in employment is bigger for holders of PhD or Master's degree (56.7% of total or 37.2 thousand persons) followed by technical vocational education graduates (55.5% of total or 33.6 thousand persons). On the contrary, employed primary education graduates decreased considerably (-33.6 thousand persons), but given that they are older, they probably retire much more often compared to other education groups. Employed university graduates also increased, but much less compared to other lower education level graduates. The fact that the labour market seems to be saturated by university graduates is important. Given the heterogeneity of employment prospects faced by this group, though, the existence of significant variations is highly likely.[5] On a quarterly basis, it seems that both university graduates and primary education graduates did not do well, since they recorded a sizeable decrease in employed persons (approximately 10 thousand). Generally, the employment rate increases with education, so that the more educated someone is, the more likely that he/she will have a job.[6] Specifically, holders of PhD or/and Master's degree have a 79.3% employment rate, while university graduates and technical and vocational education graduates have an employment rate close to 60%.

Most employed individuals are employees, which is the group of the employed that has increased the most over the past year (by 62.6 thousand or +2.6%), followed by the self-employed with personnel, i.e. businessmen, which increased by 7.9%. On the other hand, the number of the self-employed without personnel has remained almost stable, while the number of helpers in family businesses decreased. Note also that the last two groups of employed individuals have continued to decrease on a y-o-y basis since 2008, when, on the other hand, the number of both self-employed with personnel and employees started to increase, the first since 2015 and the second since 2014. In other words, it seems that a transformation of employment is under way during the crisis that favours employees and businesses. Implemented tax policy, especially the provisions of the recent L.4387/2016 (article 39), seems to complicate things even more, particularly for the self-employed known as "quasi employees", i.e. those who have only one employer, but they are treated like self-employed.[7]

This transformation involves employees also, as will be discussed next, by worsening the terms of employment and compensation. At this point, it is important to point out that the increase in part-time employment, which turned systematic in the third quarter of 2011, equaled 41.4% in period 2008c-2016c, when at the same time full-time employment decreased by 23%. As a result, in 2016c one person out of ten was employed part-time compared to one out of twenty in 2008c. Moreover, of these, approximately seven out of ten argue that they were unable to find a full-time job, thus part-time employment is a forced way out, not by choice, when in 2008c that was true for four out of ten.

5. Mitrakos, Th., Tsakloglou, P. and I. Cholezas, 2010. Determining factors of youth unemployment probability in Greece with an emphasis on tertiary education graduates. Bank of Greece, *Economic Bulletin* 33, pp. 23-68.

6. Note that this is the result of two variables favouring more educated individuals: a) the decision to participate in the labour market and b) the probability of getting a job.

7. The provision changes the way social security contributions are calculated. The problem is that not all parameters are clear yet, which causes uncertainty, especially to "quasi employees". In practice, the law treats them as the standard self-employed (multiple employers), who, nevertheless, have more options to react to the new social security contributions and mitigate the burden. It seems that failure to restrain tax evasion, no matter what the causes are, lead to the introduction of additional distortions in the labour market.

In agreement with previous issues of *Greek Economic Outlook,* the consequences of the crisis vary across industries. Table 3.1.3 presents the number of employed individuals per industry at the beginning of the crisis (I) and the third quarter of 2016 (III), the minimum number of employed since then (II), which is traced at different points in time for each separate industry.[8] The same table also reports the percentage change of the employed from the beginning of the crisis until the minimum number (IV) and from

TABLE 3.1.3 Employment by industry and changes over time

	2008c (I)	MNM (II)	2016c (III)	2008c-MNM (IV)	MNM-2016c (V)
	th.	th.	th.	%	%
Agriculture, forestry and fishery	510.5	445.3	456.6	-12.8	2.5
Mining and quarrying	17.3	8.8	14.0	-49.1	59.1
Manufacturing	548.2	314.2	355.8	-42.7	13.2
Electricity, gas, steam and air conditioning supply	33.0	22.3	27.5	-32.4	23.3
Water supply, sewerage, waste management and remediation activities	32.4	19.3	24.9	-40.4	29.0
Construction	400.9	142.3	145.4	-64.5	2.2
Wholesale and retail trade, repair of motor vehicles and motorcycles	841.2	616.4	665.9	-26.7	8.0
Transportation and storage	214.3	166.7	192.6	-22.2	15.5
Accommodation and food service activities	347.5	236.3	381.0	-32.0	61.2
Information and communication	79.8	66.6	83.6	-16.5	25.5
Financial and insurance activities	119.8	84.2	94.7	-29.7	12.5
Real estate activities	8.8	2.3	4.9	-73.9	113.0
Professional, scientific and technical activities	240.7	185.8	202.3	-22.8	8.9
Administrative and support service activities	79.3	58.5	96.2	-26.2	64.4
Public administration and defence, compulsory social security	376.9	296.4	331.4	-21.4	11.8
Education	319.0	269.4	276.9	-15.5	2.8
Human health and social work activities	233.2	205.2	222.8	-12.0	8.6
Arts, entertainment and recreation	61.2	39.3	50.9	-35.8	29.5
Other service activities	97.1	64.1	68.0	-34.0	6.1
Activities of households as employers[9]	77.1	39.3	39.3	-49.0	0.0
Activities of extraterritorial organizations and bodies	1.4	1.1	1.9	-21.4	72.7

Source: Labour Force Surveys, ELSTAT, KEPE processing.

Notes: 1. MNM= minimum number of employed. 2. The minimum number of employed is not always at the same year and quarter for all industries. For example, in *Electricity, gas, steam and air conditioning supply* the minimum number of employed was recorded in 2011b, while in *Activities of households as employers* it was recorded in 2016c. Four industries have fewer employed individuals compared to 2013a.

8. The smallest number of employed individuals is recorded in 2013 for eight industries (out of 21), in 2014 for five industries and in 2015 for five industries.

9. The 0 value in column (V) is due to the fact that *Activities of households as employers* is the only industry which still exhibits a decreasing number of employed individuals.

the minimum number until the third quarter of 2016 (V). In some industries, employment decreased more than 60%. Such industries are *Real estate activities* (73.9%) and *Construction* (64.5%). In other industries employment decreased more than 40%, e.g. *Mining and quarrying* (49.1%), *Activities of households as employers* (49%), *Manufacturing* (42.7%) and *Water supply, sewerage, waste management and remediation activities* (40.4%). On the other hand, a smaller decrease in employment (<20%) is observed in *Human health and social work activities* (12%), *Agriculture, forestry and fishery* (12.8%), *Education* (15.5%) and *Information and communication* (16.5%). Note that employment reductions took place faster in some industries than others, but since then the turning point has been reached by all but one industry, namely *Activities of households as employers*.

Real estate activities exhibits the strongest recovery, which started in 2014c and has led to employing double the number of individuals since then, although total employment in the industry is still below 60% of what it was compared to 2008c. Four industries record approximately 60% or somewhat higher increases: *Activities of extraterritorial organizations and bodies* (72.7%), *Administrative and support service activities* (64.4%), *Accommodation and food service activities* (61.2%) and *Mining and quarrying* (59.1%). Note that the first three industries, along with *Information and communication*, employed more individuals in 2016c than in 2008c. That does not mean, of course, that the demand for labour increased in the classic sense of the term, since it could be the case that hours of employment actually decreased (i.e. through more part-time or work-in-shifts jobs). Furthermore, over the past year, *Transportation and storage* exhibited a strong increase in the number of employed individuals (25.9%) followed by *Accommodation and food service activities* (16%).

3.1.4. Evolutions in paid employment

As already discussed, employees in Greece in 2016 represented 65.9% of employed individuals, a marginally bigger share compared to 2008, despite the decrease in employed individuals during the crisis, since it seems to have been spread out amongst different types of employment.[10] A larger decrease was recorded in 2016 compared to 2008 with respect to the number of the self-employed with employees (-29.4%), i.e. businesses, and with respect to the number of assistants in family businesses (46.9%).[11] At the time this text was written the latest available data from ERGANI referred to December 2016.

The first remark is that paid employment increased in December, since layoffs (expired contracts and voluntary quits) were 11,132 fewer than hires. The interesting part is that this increase is the biggest recorded in the past few years (2014 and 2015), but it falls short of the increase recorded in 2013 (19,999). In total 136,260 new jobs of paid employment were created in 2016, which is a better record compared to 2013 and suggests that the labour market is recovering from the modest results of the last two years, when approximately 100,000 jobs were created annually, and seems to be regaining its dynamism, despite the high degree of uncertainty at national and international levels.

Men filled less than half of the new jobs in October, November and December. Nevertheless, until September the majority of new jobs were occupied by men, with the exception of April. Indeed, in specific months men seem to have occupied almost all new jobs, e.g. in June (88.7%) and July (82.3%). As a result, in 2016 overall, men filled 56.6% of new jobs, a somewhat lower share compared to 2015. On the other hand, most new jobs in December were occupied by youth aged 15-24 (7,051 jobs or 63.3% of total new jobs). Seasonal volatility is particularly intense amongst youth, since in June and July they are the ones predominantly occupying new jobs and in period August-October they are the ones losing their jobs. In total, in 2016 youth aged 15-24 filled 40.1% of new jobs of paid employment, while the next age group (25-29), which also consists of youth (at least in the labour market, due to the short time since graduation, especially for tertiary education graduates), filled 23.1% of new jobs. These are the only two age groups which are over-represented in occupying new jobs.[12] Note that compared to 2015 this over-representation is less pronounced.

The first negative aspect of the labour market in 2016 involves the composition of new jobs with regard to their type. In particular, in period January-December 2016 the majority of hires involved part-time jobs and work-

10. These figures are drawn from published LFS data by ELSTAT and involve means for the first three quarters of each year.

11. These two facts probably reflect the blow taken by small and usually family businesses in Greece during the crisis.

12. In order to make clear the size of over-representation in filling new jobs, it suffices to report that, according to ELSTAT data, in 2016 (January-September) the unemployed aged 15-24 accounted for 11.1% of the total unemployed, while the unemployed aged 25-29 accounted for 15.4% of the total unemployed.

in-shifts (54.7%), although their share decreased slightly compared to 2015 (55.5%). Hires in full-time jobs were the majority only in April and May 2016, when the same was true for four months in 2015. This points to a deterioration of the terms of employment, despite the increase in the number of employed. It must be noted, though, that at least the share of hires in work-in-shift jobs decreased in the twelve-month period, from 18% in 2015 to 14.6% in 2016.

The second negative aspect involves the conversion of full-time job contracts to part-time and work-in-shifts contracts. In total, some 51,262 full-time job contracts were converted to flexible types of employment contracts in 2016 vs. 78,917 in 2015. The decrease is approximately 35% and probably justifies some optimism. A closer look, though, reveals that 2015 had been dominated by July,[13] a month full of adverse incidents in the Greek economy and society. Moreover, if one subtracts the July effect from both years, then the decrease in conversions hardly reaches 2.5%. Therefore, there is no room for complacency. Nevertheless, the fact that, excluding July, conversions of full-time job contracts to work-in-shifts contracts without the consent of the employee decreased by 37.1% in 2016 is comforting.[14] On the contrary, conversions of full-time jobs to part-time jobs increased (5.4% including July and 9.5% excluding July).

To conclude, it seems that the labour market continued to recover in 2016, despite insufficient performance in specific months, and that is a welcome development. On the other hand, the type of jobs this recovery is based upon should be of concern, since flexible jobs usually imply greater uncertainty and lower wages. This development could hamper the strengthening of internal demand and delay exiting the crisis. The preference of the labour market towards youth is probably related to active labour market programmes that lower the labour cost even further (note that there is a sub-minimum wage for youth younger than 25), but it could also be the outcome of more flexible terms of employment (regarding time schedule, stability, wages, insurance, etc.) that youth tend to accept more easily compared to older individuals. On the other hand, the preference of the labour market towards male candidates for jobs is a finding that deserves more analysis.

3.1.5. Employment and private consumer demand

An issue that has recently been publicly discussed is the link between employment and private consumer demand. In particular, even as unemployment decreases and employment increases, as observed,[15] private consumer demand for goods and services is not getting any stronger. A careful examination of facts and circumstances reveals at least five reasons, which involve exclusively the labour market and could interpret the weak link between employment and private consumption demand. There is no doubt that there are also other explanations, which are not directly linked to the labour market, such as direct and indirect tax increases, increases in the international oil price, which cause increases in the prices of raw materials, as well as in products and services that use oil as an input, etc.

The first possible explanation involves the type of employment, i.e. new jobs. As already mentioned in previous sections, flexible forms of employment continue to expand (part-time and work-in-shifts jobs), especially amongst paid employment, which are, of course, preferred to unemployment, but they usually involve fewer working hours per week or month and, consequently, lower wages. In this context, increases in the number of the underemployed (including part-time employed) is easily explained and expected. For example, according to ELSTAT data, the share of the underemployed increased in period 2015c-2016c from 6.4% to 7.1%. In other words, the number of the employed increased by 1.8%, while the number of the underemployed increased by 12.9%.

Moreover, contrary to full-time contracts, flexible job contracts increase uncertainty regarding future work prospects and, thus, future income flows, and tend to hold back private consumption demand. This means that even if wages are satisfactory, uncertainty about their future flow hinders private consumption increases, e.g. through postponing purchases for the future. If one also adds the general uncertainty caused by the delays in concluding the second assessment and in activating favourable provisions regarding public debt and, consequently, the successful implementation of the third memorandum of understanding and the completion of the process

13. Note that 40.3% of total conversions (January-November 2015) took place in July.

14. The reader should be reminded that the term “conversion of a job contract with the consent of the employee” is not considered legitimate by the writer, since the crisis and the consequent high unemployment rates have weakened the bargaining power of employees and, therefore, their consent might not be the result of free choice.

15. See e.g. the Weekly Bulletin for Economic Developments (5/1/2017) published by ALPHA BANK, which is available at <http://www.alpha.gr/files/infoanalyses/weekly05012017.pdf>.

to exit the crisis, the grounding of private consumer demand to low levels is no mystery.

A third plausible explanation involves undeclared labour. Greece is often considered[16] to have a very high share of undeclared and unsecured employed[17] within the context of a widespread shadow economy,[18] although economy-wise, undeclared labour is probably not as common as is believed.[19] The most recent available data by the operational programme ARTEMIS (9/2013-11/2015) estimate that unsecured employed persons constitute approximately 5.3% of the total employed, although this share is much higher amongst non-natives (13.6%). Given the intensification of audits and the strict fines enforced (18 times the minimum wage), it is very likely that unsecured workers are formally declared in order to avoid getting caught and paying the exhaustive fine or simply because the situation improved a little and the firm decided to fully or partly legitimise unsecured employed persons already on the payroll.[20] It is clear that such actions do not increase the disposable income of those involved, but simply makes it visible to public revenue services and social security institutions and allows its measurement.

A fourth plausible explanation could involve emigration. In particular, the unemployment rate decreases because people are leaving the country in search of a job abroad. It should be noted that the unemployment rate is calculated as the ratio of unemployed persons and the sum of unemployed and employed persons (i.e. the labour force). Thus, if some of the unemployed decide to leave, the numerator decreases faster than the denominator and the ratio falls, i.e. unemployment decreases. Various articles in the press argue that there has been a big outflow of unemployed persons from Greece towards other countries, in order to find jobs, since 2010.[21] Moreover, Labrianidis and Pratsinakis (2016) estimate that approximately 240,000 Greeks have left the country between 2010 and 2015. Half of them were unemployed. An important finding, which verifies the phenomenon of brain drain, is that emigrants from 1990 and onward are tertiary education graduates, a phenomenon which has been reinforced since 2010 (64% of highly skilled individuals have left the country since 2012).[22]

A fifth interpretation could be that increased employment involves lower wages than the past, even when the same terms of employment apply –for example, hours and job description. Therefore, despite increased employment, total disposable income from work does not increase accordingly. Wage drops as a result of the crisis began in 2009. According to ELSTAT's index,[23] wage reduction in the third quarter of 2009 reached 1.3%. Since then, annual reductions accelerated, reaching 9.5% in 2012 and 7.6% in 2013. On the other hand, wages increased by 1.8% in 2014, remained almost constant in 2015 and increased marginally in 2016 (1%). In total, wages have

16. See <http://www.naftemporiki.gr/finance/story/1062111/sto-24-tou-ethnikou-eisodimatos-i-mauri-ergasia-stin-ellada> and <http://www.kathimerini.gr/870233/article/oikonomia/ellhnikh-oikonomia/h-adhlwth-ergasia-anerxetai-sto-25-toy-aep>.

17. IOBE argues that unsecured labour reached 30% in 2011 (see IOBE, 2012. *The content of undeclared work and its characteristics*. IOBE, Athens), while INE-GSEE increases that share further to 40.5% in 2013 (see Kapsalis, A., 2015). *Undeclared work in Greece. Assessment of the modern tools to fight the phenomenon*. INE-GSEE, Studies, Issue 43). In a special issue of the Eurobarometer in 2014 regarding undeclared work (2013 data), only 3% of interviewees in Greece reported they provided undeclared work. Thus, the country ranked amongst the countries with the lowest rates of undeclared work. On the other hand, 54% reported that they know someone who did provide undeclared work and the country ranked at the top places. See <http://ec.europa.eu/public_opinion/archives/ebs/ebs_402_en.pdf>, pp. 50 and 54.

18. See, for example, Bitzenis, A., Vlachos, V. and F. Schneider, 2016. An Exploration of the Greek Shadow Economy: Can Its Transfer into the Official Economy Provide Economic Relief Amid the Crisis? *Journal of Economic Issues*, 50(1), pp. 165-196. The authors estimate that the shadow economy reaches 25% in period 2009-2011, when the respective share in the EU28 is approximately 20%, indeed lower than estimates of the past (p. 184). The confusion between the shadow economy and undeclared work should be avoided, since they are two different things.

19. See Kanellopoulos, C., 2012. Size and structure of unsecured work. Bank of Greece, *Economic Bulletin*, 37, pp. 25-44. Kanellopoulos estimates the average share of undeclared work economy-wide over period 2006-2012 to be close to 12%.

20. As stated in the diagnostic report on undeclared work in Greece prepared by the ILO (see <http://www.sev.org.gr/Uploads/Documents/49757/1_Diagnostic_Report_on_undeclared_work_in_Greece_gr.pdf>, pp. 26-27), during the crisis it is not rare to observe the following: a) the employer pays two wages to the employee, one official and one unofficial (shadow money) and b) the employee is declared as working part-time, but in reality he/she is employed more hours.

21. See, for example, <http://www.tovima.gr/politics/article/?aid=354901)>.

22. The report is available at: <http://www.lse.ac.uk/europeanInstitute/research/hellenicObservatory/CMS%20pdf/Research/NBG_2014_-Research_Call/Final-Report-Outward-migration-from-Greece-during-the-crisis-revised-on-1-6-2016.pdf>.

23. Available at: <http://www.statistics.gr/el/statistics/-/publication/DKT08/->. The wage index used is adjusted for seasonal volatility.

decreased by approximately 20% since 2008c. Now, add to that the great reduction in self-employed income[24] and the reduction in disposable income due to higher taxes, and then the picture drawn can easily interpret the weak link between new jobs and private consumption.

3.1.6. Conclusions

The labour market seems to have improved further in 2016. Unemployment went down and employment went up. Men and youth aged 15-24 seems to be favoured more than women and older individuals. What also seem to improve faster are employment prospects for gymnasium graduates and technical and vocational education graduates, as well as for holders of PhD and/or Master's degree. Unemployment seems to de-escalate faster in specific regions, such as the Ionian islands, Central Macedonia and Attica. These regions could potentially be used as case studies, in order to determine the features that allow such de-escalation to take place.

Increases in employment lead to the transformation of the structure of the pool of the unemployed, since employees and the self-employed with personnel, i.e. firms, are reinforced. In particular, *Real estate activities* has doubled its employed persons since 2014, while four more industries have recorded an increase in employed persons between 40% and 60% (*Activities of extraterritorial organizations and bodies, Administrative and support service activities, Accommodation and food service activities* and *Mining and quarrying*). A closer look at the increase in employment, though, reveals that it relies on the expansion of flexible types of work contracts, which involve greater uncertainty and, usually, lower compensation. The last observation, in combination with the increased probability of gradually declaring already employed persons to avoid audit and unbearable fines, the reduction in the number of the unemployed due to emigration in search of jobs and the lower wages associated with new jobs with similar terms of employment with the past, can interpret to a great extent the weak link between increased employment and decreased unemployment with the stability observed in private consumption.

24. The reduction in self-employed income, among others, is evident by the great delays in collecting social security contributions by OAEE, see: <http://www.euro2day.gr/news/economy/article/1441330/asfalistiko-hreh-kai-daneika-pnigoyn-ta-tameia.html>.

3.2. The health system in Greece: recent trends and comparative analysis with the other European countries

Roxani Karagiannis

The quality of care and the universal access to health-care services have improved, yet inequalities persist both across and within European countries. The range of services covered and the level of cost-sharing between the public and private sectors can also have an important impact on public and out-of-pocket expenditures, resulting in accessibility problems for citizens. Population ageing and the financial problems faced by several countries, including Greece, is expected to further increase the pressure on the financing of health systems. Life expectancy has increased by more than six years in recent decades, yet a large proportion of the population is exposed to health risks with negative effects on their health status.

A range of structural reforms have been implemented after 2009 in the Greek health-care system, characterized by the aforementioned findings, aimed at the cost containment of health spending and the improvement of health-care system efficiency. This article presents selected indicators relating to the demographic characteristics, the health status of the population, the main causes of death, the determinant factors of health, the health-care system resources and workforce and the total health expenditures for Greece, the EU-28 countries and the World Health Organization European Region countries (WHO-EUR) using the databases of WHO-European Health for All (HFA) (2016), OECD-Health Data Statistics (2016) and Eurostat (2016). The analysis aims to describe the profile of the Greek health system and the position it occupies among European countries according to recent published data.

3.2.1. Selected demographic indicators

According to the WHO (2016), European countries are faced with a below-replacement birth rate and a rapidly ageing population. These trends are particularly heightened in Greece, resulting in a gradual change in the population structure after 2000. These changes may impose additional economic pressures both in the health-care system and the overall economy.

In 2013, the population group aged 0-14 years comprised 14.7% of the total population, compared to 15.6% for the EU-28 and 17.5% for the WHO-EUR countries (Table 3.2.1). A decline of 4.3% was reported in Greece during the period 2000-2013 relative to 9.2% and 10.3%, respectively, in the EU-28 and WHO-EUR countries. On the other hand, the population group aged over 65 years comprised 20.3% of the total population, representing an increase by 22% relative to a lower increase by 17.6% and 12.4% in the EU-28 and WHO-EUR countries, respectively.

The total fertility rate fell gradually after 2010. In 2012, the total fertility rate was equal to 1.3 units, reduced by 0.2 and 0.3 units relative to the EU-28 and WHO-EUR countries, respectively (Table 3.2.1). The rate of live births per 1,000 population was lower compared with the average level of the other European countries while the crude death rate per 1,000 population was higher. Given these trends, it is not surprising that the natural population growth was negative (-1.5 units) in Greece.

TABLE 3.2.1 Selected demographic indicators, 2012 or nearest year

Indicators	Greece	EU-28	WHO-EUR*
Population (in 000)	10,096	507,844	905,093
% aged 0-14 years	14.7	15.6	17.5
% aged 65+ years	20.3	18.5	15.1
Total fertility rate	1.3	1.6	1.7
Live births per 1,000 population	9.1	10.0	12.3
Crude death rate per 1,000 population	10.5	9.8	9.9
Natural population growth per 1,000 population	-1.5	0.2	2.4
GINI coefficient (income distribution)	36.7	31.1	33.5

Source: European Health for All (HFA) Database (2016).

*WHO-EUR corresponds to 53 countries constituting the European Region of the World Health Organization.

3.2.2. Health status indicators

The indicators of life expectancy at birth and at age 65 have continued to increase in all European countries in recent decades. These gains are attributed mainly to the improvement of socio-economic conditions, such as the level of education and lifestyle, as well as the improvement of population health due to advanced medical care, the universal access to health-care services and the reduction of mortality rates from cardiovascular and other diseases. In 2014, life expectancy at birth (81.5) in Greece was higher relative to the average of the EU-28 and WHO-EUR countries (80.9 and 77.5, respectively) and increased by 3 years compared to 2000 (Table 3.2.2). Greece is one of the 10 top countries with the highest life expectancy at birth while Spain, Italy and France ranked at the first positions. Women achieved a higher life expectancy at birth relative to men over time (84.1 and 78.9 in 2014, respectively).

Life expectancy for people at age 65 years in Greece (19.8 in 2014) rose by 2.3 years during the period 2000-2014, obtaining values very close to the average of the EU-28 (20.0) and WHO-EUR (18.3) countries (Table 3.2.2). Life expectancy for women at age 65 years increased by 3 years relative to 2.5 years for men during the period 2000-2014. According to the OECD (2016), life expectancy at age 65 is expected to grow by 4.7 years for women and 4.5 years for men, on average, between 2013 and 2060. This increase, combined with the reduction in the fertility rate, will pose challenges associated with an ageing population, reducing labour market participation rates and increasing pressure on pensions and health expenditures for long-term care.

Healthy life years are the number of years spent free of long-term activity limitation (OECD, 2016). In Greece, the healthy life expectancy at birth indicator was 64.8 years for women and 64.1 years for men and after 2000 has reduced gradually by 3.4 and 2.2 years, re-

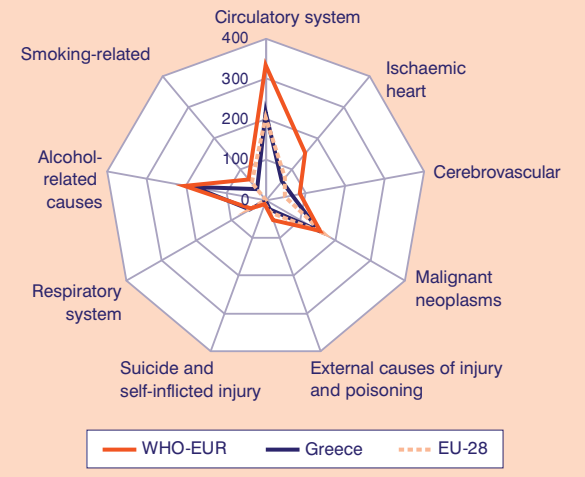
TABLE 3.2.2 Selected health status indicators of population, 2000 and 2014

	Greece	EU-28	WHO-EUR	Greece	EU-28	WHO-EUR	Change
Indicators		**2000**			**2014**		
Life expectancy at birth							
Total	78.6	77.5	74.0	81.5	80.9	77.5	▲
Female	80.9	80.7	77.9	84.1	83.7	80.8	▲
Male	75.6	74.1	70.1	78.9	78.0	74.2	▲
Life expectancy at age 65							
Total	17.5	17.8	16.4	19.8	20.0	18.3	▲
Female	18.6	19.4	14.3	21.6	21.6	16.3	▲
Male	16.3	15.7	17.2	18.8	18.0	19.9	▲
Healthy life years at birth							
Female	68.2	64.4	n.a.	64.8	61.8	n.a.	▼
Male	66.3	63.5	n.a.	64.1	61.4	n.a.	▼
Healthy life years at age 65							
Female	10.6	10.4	n.a.	7.1	8.6	n.a.	▼
Male	9.6	9.8	n.a.	7.7	8.6	n.a.	▼
Mortality rates for all causes of death per 100,000 population – Age standardised rates for all ages*							
Total	704.6	735.8	948.6	553.1	578.0	744.2	▼
Female	572.2	569.1	720.1	433.4	452.8	571.6	▼
Male	855.5	956.0	1,256.8	689.2	734.4	970.3	▼
Infant mortality per 1,000 live births*							
Total	5.4	5.9	9.9	2.9	3.8	6.7	▼
Female	4.8	5.3	8.8	2.6	3.5	6.1	▼
Male	6.1	6.5	11.1	3.3	4.1	7.5	▼

Source: European Health for All (HFA) Database (2016), OECD Health Data Statistics (2016), Eurostat Database (2016).

▲: increased, ▼: decreased, n.a. = not available. *2012.

FIGURE 3.2.1 Main causes of death (age standardized rates per 100,000 population, all ages), 2012



Source: European Health for All (HFA) Database (2016).

spectively, obtaining values above the average of the EU-28 countries (Table 3.2.2). Healthy life expectancy for people aged 65 years was 7.1 years for women and 7.7 years for men in 2014, reduced by 3 years relative to 2000. We can observe that the gender gap for healthy life expectancy at age 65 was lower relative to the corresponding life expectancy index, indicating that women might develop some kind of disability to a greater extent than men after the age of 65 years.

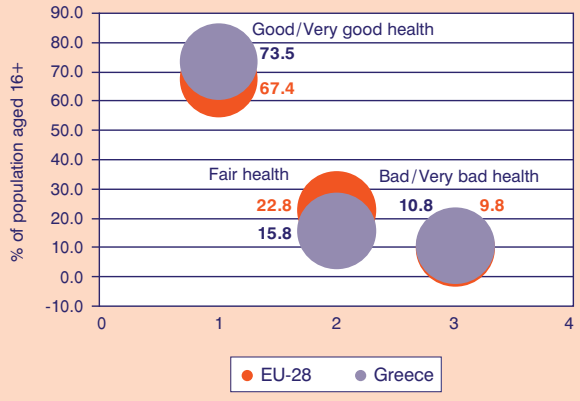
Mortality rates per 100,000 population[1] reduced gradually in Greece in recent decades, obtaining values below the average of the EU-28 and WHO-EUR countries (Table 3.2.2). It was reduced by 21.5% (705 deaths in 2000 to 553 in 2012) during the period 2000-2012. The mortality rate among men was, on average, 35% higher than among women in 2012. Similar reduced age-standardized death rates were observed in all European countries. Death rates were lower in Spain, France and Italy and higher in Bulgaria and Serbia.

Figure 3.2.1 above shows the main causes of deaths for the total population in Greece and the other European countries in 2012. Main causes of death were circulatory, malignant neoplasm, cardiovascular, cerebrovascular and respiratory diseases and smoking-related causes. The external causes of injury due to accidents and suicide and self-inflicted injuries represent, also, a great portion. According to van Gool and Pearson (2014), there is a strong relationship between adverse economic conditions and higher levels of suicide. Suicide rates rose slightly, mainly among men, in a number of European countries at the beginning of the economic crisis in 2008. In Greece, mortality rates from suicide remain relatively low compared to the other European countries, but the absolute number of deaths due to suicide has increased substantially, from 328 in 2007 to 532 in 2013, resulting in a 60% increase in absolute terms during the period 2007-2013 (OECD, 2016).

Infant mortality rates reflect the effect of economic and social conditions on the health of mothers and newborns, as well as the effectiveness of health systems, particularly in dealing with health complications during the first 4 weeks of neonatal life. Infant mortality rates remain at low levels in most European countries, reporting small differences among countries and indicating the remarkable progress in reducing infant mortality rates that were achieved after the 1970s (OECD, 2016). In Greece, infant mortality per 1,000 live births decreased by 2.5 units during the period 2000-2012, reaching 3 deaths in 2012 compared with 4 and 7 deaths in the EU-28 and WHO-EUR countries, respectively (Table 3.2.2).

The EU-SILC[2] survey allows respondents to report on their general health status, whether they have chronic illness or faced health problems.[3] On average, in EU-28 countries, 67.4% of the population (relative to 73.5% in

FIGURE 3.2.2
Self-reported health and disability status, 2014



Source: OECD Health Data Statistics (2016).

1. The rates concerning the number and causes of deaths have been age-standardised to be comparable across countries.

2. EU Statistics on Income and Living Conditions Survey.

3. We should notice that the bias of responses relies on the subjective view of respondents. Also, older people report "bad health" more often than younger people. As a result, countries with a higher proportion of elderly people will report a lower proportion of people reporting "good/very good health".

Greece) rate their health as "good/very good" and only 10.8% as "bad/very bad" (Figure 3.2.2 above). Greece ranked among the top 10 countries with the highest rate of good health, followed by Ireland, Sweden, Cyprus and the Netherlands. By contrast, less than 50% of adults in Portugal, Latvia and Lithuania reported "good health". In all European countries, men reported better health relative to women, while people's rating of their own health tends to decline with age. People in the highest income group are much more likely to report good health than people in the lowest income group. According to the OECD (2016), these disparities may be explained by differences in living and working conditions, lifestyles, physical inactivity and limited access to certain health-care services.

3.2.3. Determinant factors of health

Tobacco consumption is the most significant cause of premature death, with nearly 700,000 deaths per year (OECD, 2016). Tobacco smoking has both immediate and long-term health consequences for citizens. Children who establish smoking habits early have a greater probability of cancer and cardiovascular or respiratory illness and are also more likely to "experiment" with alcohol and other drugs. One of the most significant effects of smoking is nicotine addiction, which keeps young people smoking longer, increasing the risk of adverse health effects.The portion of young people aged 15 years who smoke at least once a week was 13% for girls and 16% for boys in Greece in 2013-2014 compared with 14.2% in EU-27 countries (Table 3.2.3). Greece ranks below the average of the European countries, while Bulgaria occupies the first place (30% for boys and 21% for girls) and Sweden the last place (6% for boys and 7% for girls). The average rate of young smokers has decreased consistently since 2001-2002, converging to 1993-1994 levels.

Greece, Bulgaria and Cyprus had the highest rates (27.3%) of adult smokers aged 15 years and over among the European countries. On the other side, Luxemburg and Sweden recorded the lowest rates (15.3% and 11.9%, respectively). On average, the proportion of daily adult smokers reduced by 16% in 2014 relative to 2000, with a higher decline among men than women. This decline can be attributed to a combination of structural policies, increased taxation on smoking products and public awareness campaigns.

The consumption of alcohol significantly affects the learning performance of young people aged over 15 years due to reduced attendance, increased probability of having difficulty in school or dropping out without having graduated and is associated with negative

TABLE 3.2.3 Determinant factors of health, 2013-2014 or nearest year

Factors		Greece	EU-28	Change
Smoking among 15-year-olds (at least once a week)	Girls	13.0	14.2	▼
	Boys	16.0	14.2	
Adults smoking daily (% of population aged 15+)	Total	27.3	21.0	▼
Drunkenness among 15-year-olds (drunk at least twice in life)	Girls	21.0	23.5	▼
	Boys	22.0	27.1	
Alcohol consumption among adults aged 15+ (liters per capita)	Total	7.5	10.0	▼
Overweight among children at various ages*	Girls	38.0	21.0	▲
	Boys	44.0	23.0	
Self-reported obesity among adults (% of population aged 15+)	Total	17.3	15.9	▲
Physical activity among 15-year-olds	Girls	7.0	10.0	▲
	Boys	15.0	20.0	
Physical activity among adults (% of population aged 15+)	Female	67.4	60.2	
	Male	68.7	68.2	▲
	Total	68.0	64.0	

Source: OECD Health Data Statistics (2016).

*2010 ▲: increased, ▼: decreased.

psychological effects, accidents and violence (OECD, 2016). In Greece in 2013-2014, 21% of girls and 22% of boys aged 15 years reported that they had been drunk at least twice in their lives (Table 3.2.3). These rates are very close to the average of EU-27 countries. Denmark was the top country with 38% for girls and 39% for boys. Since 1993-1994, the average rate of European countries has fallen by 10 percent.

Alcohol consumption was one of the main causes of death, after tobacco and high blood pressure, in Europe in 2012 and was associated with 7.6% and 4% of deaths for men and women, respectively (OECD, 2016). The European countries recorded the highest alcohol consumption rates among adults worldwide (10 liters per capita on average across EU-28 countries in 2014). Lithuania, Belgium and Austria were the top countries with 12 liters per adult on average and Sweden, Greece and Italy were the bottom countries with 7.5 liters per adult on average (Table 3.2.3).

Obesity and overweight are high risk factors for numerous chronic diseases such as hypertension, high cholesterol, diabetes, cardiovascular diseases and some types of cancer. Overweight can cause psychological problems in children such as reduced self-esteem, depression and eating disorders (OECD, 2016). In Greece, more than one in three children (38% for girls and 44% for boys) aged 10-12 years old had obesity problems in 2010, compared with one in five children, on average, in European countries (Table 3.2.3). Child obesity recorded an upward trend in recent decades worldwide. The average of self-reported overweight and obesity rates across European countries increased by 7 percentage points during the period 2001-2014 and Greece had one of the highest growth rates (OECD, 2016).

Self-reported obesity among adults was equal to 17.3% in Greece in 2014 compared to 15.9% in EU countries on average (Table 3.2.3). Obesity increased by 5 percentage points on average in European countries after 2010 due to the extended consumption of unhealthy, high-fat food and physical inactivity of the population.

The World Health Organization recommends that children should participate in some kind of physical activity at least 60 minutes and adults at least 150 minutes daily. However, data suggest that a great portion of children and adults do not meet these guidelines. In the EU-28 countries, one in four children aged 11-15 years old in 2013-2014 reported that they exercised regularly (Table 3.2.3). Greece (7% for girls and 15% for boys), France and Italy ranked at the bottom end where only one in ten girls and one in five boys have reported daily physical activity. Physical activity among adults varies across the European countries, from 38% in Romania to 80% in Sweden. In Greece, adults reporting physical activity were 68% of the total population aged over 15 years, slightly higher than the average of the EU-28 countries.

3.2.4. Health-care system resources and workforce

Greece allocated approximately 3 hospitals per 100,000 population in 2014 (Table 3.2.4). The number of hospital beds (420 beds per 100,000 population), which provides an indication of the available resources for inpatient health-care services, was 19% and 24% lower than the average of the EU-28 and WHO-EUR countries, respectively. The number of beds of private hospitals accounted for 34.7% of the total beds. We can observe that the hospital beds of the private and public sectors exhibited inverse growth rates during the periods 2000-2009 and 2009-2014 (Figure 3.2.3). The number of hospital beds of the public sector reduced by 13.5%, while those of the private sector increased by 14.3% during recent years characterized by the financial crisis and the restructuring of inpatient health care. After 2009, the total number of hospital beds reduced by 5.6% in the EU-28 countries on average and by 8.2% in WHO-EUR countries. This fall has been accompanied by a reduction in the average length of stay and in hospital admissions and discharges, in specific countries, due to the increased use of one-day-care. In 2014, Germany and Austria recorded the highest number of hospital beds per capita.

The density of doctors per 100,000 population was 626 in Greece in 2014, of whom 241 were specialist physicians and 40 were general practitioners (Table 3.2.4). Greece occupied the first position in doctor density among European countries and Austria the second with 505 doctors per 100,000 population. We must notice that this result is overestimated in Greece as it includes all doctors who are licensed to practice but may no longer be practicing for various reasons. The rise in the number of doctors per capita was particularly rapid in Greece before the economic crisis started in 2008 (41.4% in period 2000-2009 compared to 13.3% in EU-28 countries), while after 2009 this declined by 2.2% (4.4% in EU-28 countries). Similar growth rates have also been observed in the United Kingdom, although the number of physicians per capita still remains below the EU average. The share of general practitioners remained at relatively low levels, despite the significant increase in the total number of doctors. However, a rapid increase by 127.6% was recorded after 2009 compared with a 35.6% increase in the number of specialist physicians (Figure 3.2.3).

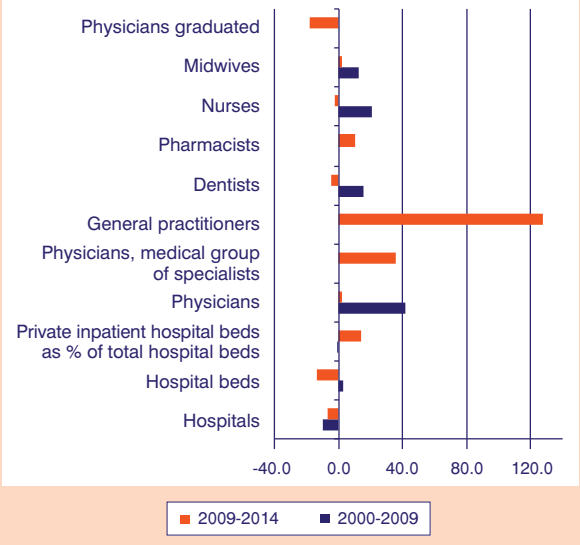
TABLE 3.2.4 Selected health-care resources indicators, 2014 or nearest year

	Greece			EU-28			WHO-EUR		
Indicators per 100,000 population	2014	Change 2000-09	Change 2009-2014	2014	Change 2000-09	Change 2009-2014	2014	Change 2000-09	Change 2009-2014
Hospitals	2.6	-10.4	-7.2	2.9	-10.0	0.7	3.1	-19.3	-8.6
Hospital beds	419.6	2.8	-13.5	521.6	-14.0	-5.6	553.9	-13.6	-8.2
Private inpatient hospital beds as % of total beds	34.7	-0.9	14.3	33.7	n.a.	3.7	n.a.	n.a.	n.a.
Physicians	625.5	41.4	2.2	349.6	11.4	6.8	322.3	9.2	8.5
Physicians medical group of specialists	240.9	n.a.	35.6	100.8	13.3	17.1	92.9	6.1	22.6
General practitioners	39.2	n.a.	127.6	79.7	4.4	1.4	62.1	12.8	-3.2
Dentists	125.0	15.6	-4.6	67.9	8.5	8.5	53.4	8.1	5.5
Pharmacists	105.3	n.a.	10.1	85.1	10.8	14.3	56.6	12.1	12.3
Nurses	344.0	20.9	-2.8	864.3	9.1	1.6	740.4	7.6	1.5
Midwives	23.8	12.2	2.3	33.1	4.7	1.8	39.9	1.5	-1.2
Physicians graduated	9.3	n.a.	-18.2	12.2	12.1	13.5	11.5	5.4	8.1

Source: European Health for All (HFA) Database (2016). Author's estimates.

n.a. = not available.

FIGURE 3.2.3
Average annual growth rates in health-care resources in Greece, 2000-2014

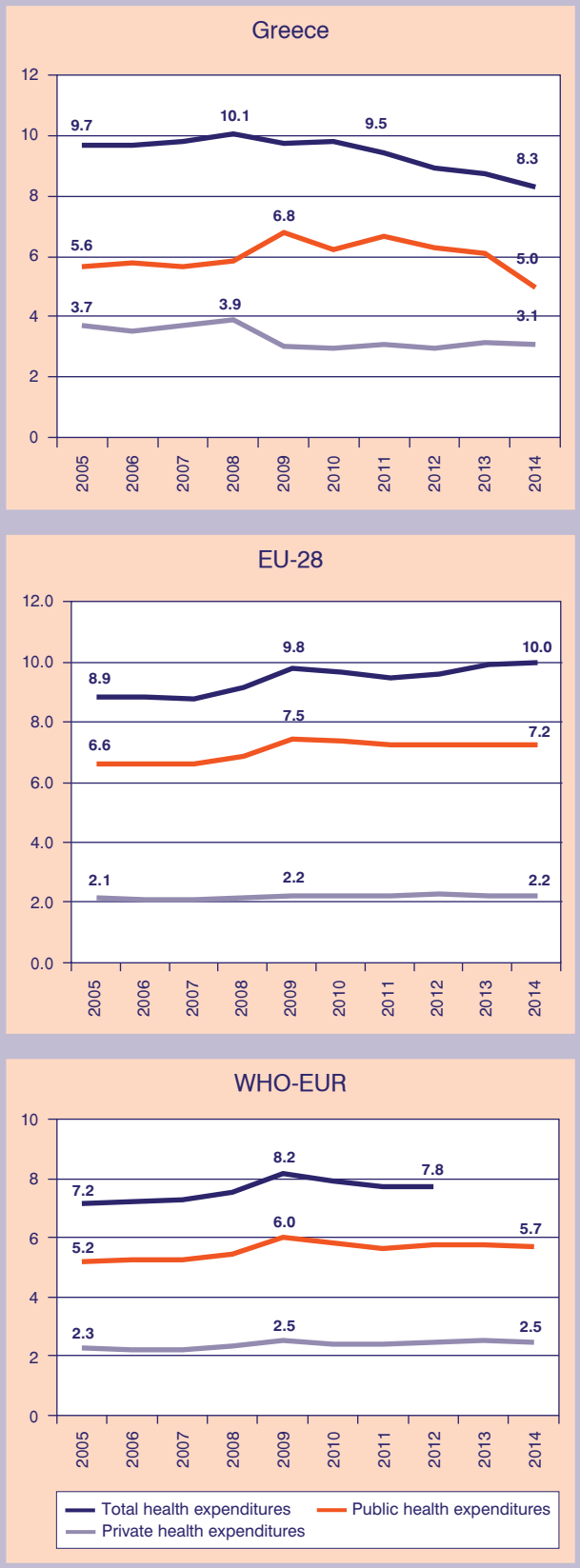


Source: European Health for All (HFA) Database (2016). Author's estimates.

A significant reduction (-18.2%) was recorded in the rate of graduate physicians per 100,000 population in Greece relative to a 13.5% and 8.1% increase in the EU-28 and WHO-EUR countries, respectively.

The density of nurses displays opposite trends than those of doctors in Greece. In 2014, the density of nurses per 100,000 population amounted to 344 nurses relative to 865 and 741 in the EU-28 and WHO-EUR countries, respectively. Greece occupied one of the lowest positions among EU-28 countries, although the number includes only those working in hospitals, while Denmark ranked in first place with 1,686 nurses per 100,000 population. Taking into consideration that nurses play a critical role in providing not only inpatient and outpatient care but also long-term care, there is a growing concern about the shortage of nurses in Greece in the future, especially when the number of nurses has reduced by 2.8% compared with an increase by 1.6% and 1.5% in the EU-28 and WHO-EUR countries, respectively. According to an OECD (2016) report, the number of nurses per doctor employed in hospitals was 1.4 in Greece, much lower than the average of the EU-28 countries (2.5) and Finland (4.7), which recorded the highest rate among European countries.

FIGURE 3.2.4
Health expenditures as a share of GDP, 2005-2014



Source: European Health for All (HFA) Database (2016).

Concerning the remaining of health professionals, as presented in Table 3.2.4, the rate of pharmacists and midwives per 100,000 population increased by 10.1% and 2.3%, respectively, during the period 2009-2014 while it decreased by 4.6% for dentists. On average, in the EU-28 countries, the rate of dentists, pharmacists and midwives increased by 8.5%, 14.3% and 1.8%, respectively.

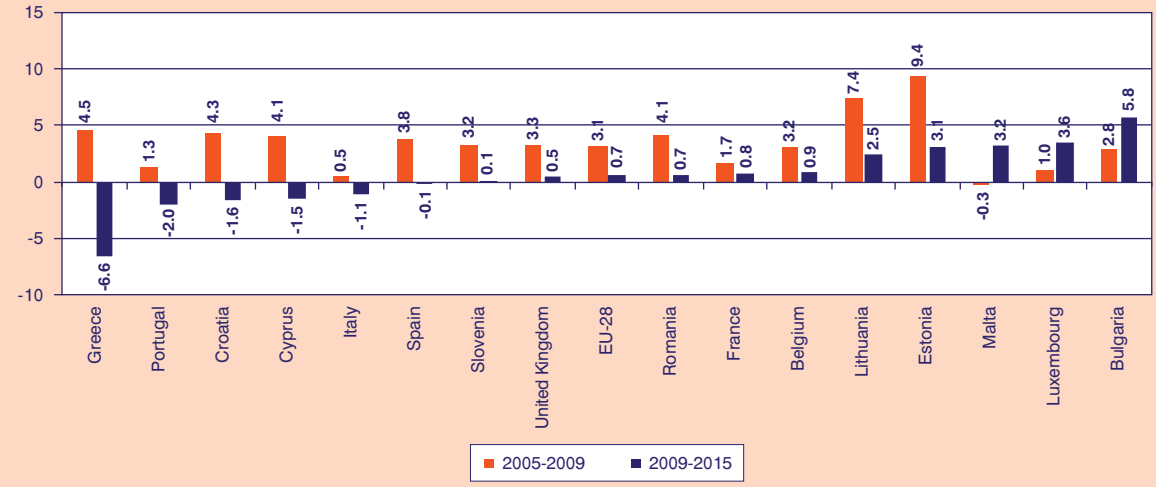
3.2.5. Health expenditure

In 2014, Greece spent 8.3% of its GDP for health care services, of which 5% related to public health expenditure and 3.1% to private health expenditure (Figure 3.2.4). After 2010 and the implementation of structural reforms for cost containment in the health system, we can observe a significant reduction in total health expenditures by 15.8%, of which the highest portion (19.8%) related to cost containment in the public sector. On the other side, the private health expenditure increased by 4.8% during the same period. On average, in the EU-28 countries during the period 2009-2011, total health expenditure decreased by 3.5%, followed by a 5.5% increase in period 2011-2014, reaching approximately 10% of GDP in 2014. The public and private health expenditure growth rates remain unchanged, about 7.2% and 2.2%, respectively, after 2011.

Greece occupied the first position among EU-27 countries with the highest share of spending on inpatient care in 2014 (41% of total health expenditure relative to 30% in EU-27 countries) compared with 36% in 2009, as a consequence of larger decreases in spending for outpatient care and pharmaceuticals (OECD, 2016). A further 22% of the overall health expenditure was allocated to outpatient care, 2% to long-term care, 31% to medical goods (mainly pharmaceuticals) and 5% to prevention and administration services (compared with 30%, 15%, 19% and 7%, respectively, in EU-27 countries).

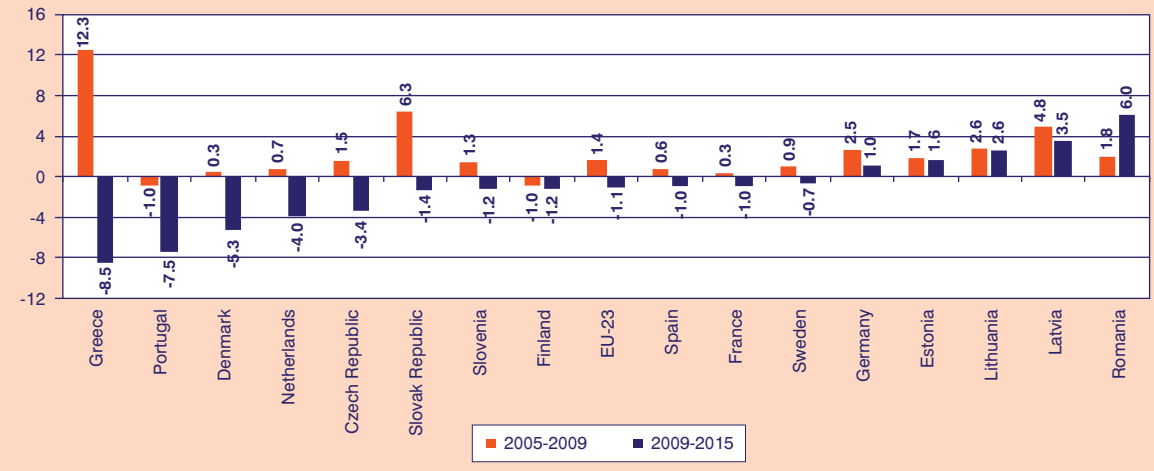
There are large variations in the level and growth rate of health expenditure per capita across European countries. Mainly high-income countries, such as Luxemburg, Norway and Switzerland, achieved the highest level of health expenditure per capita. The health expenditure per capita was € 2,781 on average in EU-28 countries in 2015, of which € 2,177 come from public sources and € 604 from private spending (OECD, 2016). Following the economic crisis in 2008, per capita health expenditure increased by only 0.7% on average each year compared with an annual growth rate of 3.1% in period 2005-2009 (Figure 3.2.5). One the other hand, Greece experienced one of the largest reversals

FIGURE 3.2.5
Average annual growth rates in per capita total health expenditure, in real terms, 2005-2015 or nearest year



Source: OECD Health Data Statistics (2016).

FIGURE 3.2.6
Average annual growth rates in per capita pharmaceutical expenditure, in real terms, 2005-2015 or nearest year



Source: OECD Health Data Statistics (2016).

of health expenditure growth. During the period 2005-2009, per capita health expenditure increased annually by 4.5%. After 2010 and the implementation of fiscal measures, per capita health expenditure increased by 6.6% on average.

Pharmaceutical expenditures represent the third largest spending item in the health sector after inpatient and outpatient care. There are wide variations in pharmaceutical expenditures per capita across European countries (from € 551 to € 201), reflecting differences in the volume and structure of consumption and pharmaceutical prices. Greece occupied the third position with € 468 in 2014; while in first and second position were Germany with € 551 and Ireland with € 523, compared with € 402, on average, in EU-27 countries (OECD, 2016). The growth rate of pharmaceutical spending also exhibited significant deviations as presented in Figure 3.2.6. Over the period 2009-2014, per capita pharmaceutical expenditures in EU-27 countries reduced by 1.1% on average, in contrast with an increase by 1.4% in period 2005-2009. This re-

duction was particularly steep in Greece (-8.5% versus 12.3% in period 2005-2009) due to the implementation of various policy measures aimed at the deterioration of pharmaceutical spending, such as the revision of the pharmaceutical pricing policy, the enlargement of the negative list, the increase in user charges for retail prescription drugs, the forced contribution of rebates and clawbacks from the pharmaceutical supply chain, shifting part of the burden of pharmaceutical spending away from public financing to private payers.

3.2.6. Conclusions

Greece is characterized by a simultaneous increase in the index of the ageing population and a reduction in the fertility rate, resulting in a gradual change in the population structure that may impose additional economic pressure on the health-care system in the future. The health status of the Greek population was among the best in the European countries. The improvement in health status, as measured by life expectancy and mortality rates, has continued but with a slower rate than the average level of European countries. The main causes of deaths are circulatory, malignant neoplasm and cardiovascular diseases and smoking-related causes. The implementation of structural policies, such as taxation on smoking products and public awareness campaigns, appear to contribute positively to the reduction of the number of daily smokers. However, more efforts are required to reduce overweight and obesity as well as to motivate citizens for more physical activity. The health system is characterized by a high density of doctors, a low density of nurses and a high level of inpatient care. It is noticeable that during the economic crisis, the proportion of doctors has continued its upward trend but with a diminishing growth rate in parallel with a rapid increase in the proportion of general practitioners. After the implementation of a large number of structural reforms since 2010, the total health expenditure, per capita expenditure, pharmaceutical expenditures as well as outpatient health expenditures decreased substantially while the share of out-of-pocket expenditures increased.

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4. Development policies and sectors

4.1. Competitiveness of the Greek Economy

Athanasios Chymis

In the first article of this column (Issue 29, Feb. 2016) there was a thorough analysis of the meaning of competitiveness as well as its critical role in economic growth. The relation between competitiveness and productivity was demonstrated and it was shown that competitiveness is the *sine qua non* condition for attracting domestic and foreign investment. This short article will illustrate the recent developments in the competitiveness of the Greek economy. A widely accepted measure of competitiveness is the yearly published report on the Global Competitiveness Index (GCI) issued by the World Economic Forum (WEF).[1] The report is issued every end of September and is based on data from the previous year. This means that the report of 2016 entitled *Global Competitiveness Report 2016-2017,* published in September 2016, refers to the competitiveness of 2015. The following table refers not to the year the report was published but to the year to which the actual data refer (i.e. the previous year).

According to the GCI, the Greek economy's competitiveness in 2015 fell from the 81st to the 86th position in the global ranking (among 138 economies), thus

TABLE 4.1.1 Evolution of Greek rankings with respect to the Global Competitiveness Index

	2007	2011	2012	2013	2014	2015
Total number of countries	134	144	148	144	140	138
Global Competitiveness Index: Greece	**67**	**96**	**91**	**81**	**81**	**86**
A) *Basic requirements*	*51*	*98*	*88*	*76*	*74*	*80*
1. Institutions	58	111	103	85	81	81
2. Infrastructure	45	43	38	36	34	37
3. Macroeconomic environment	106	144	147	135	132	131
4. Health and primary education	40	41	35	41	41	46
B) *Efficiency enhancers*	*57*	*69*	*67*	*65*	*62*	*67*
5. Higher education and training	38	43	41	44	43	45
6. Goods market efficiency	64	108	108	85	89	89
7. Labor market efficiency	116	133	127	118	116	114
8. Financial market development	67	132	138	130	131	136
9. Technological readiness	59	43	39	39	36	42
10. Market size	33	46	47	49	52	56
C) *Innovation and sophistication factors*	*68*	*85*	*81*	*74*	*77*	*70*
11. Business sophistication	66	85	83	74	74	69
12. Innovation	63	87	87	79	77	72

Source: Global Competitiveness Index (WEF, several years' reports).

1. <https://www.weforum.org/reports/the-global-competitiveness-report-2016-2017-1>.

interrupting the increasing trend that started in 2011. Greece had a significant loss of competitiveness during the period 2007-2011, a loss associated with the debt crisis and the significant worsening of its macroeconomic environment.

However, it should be stressed that, as noted in the last article of this column (Feb. 2016), the Greek economy's competitiveness was not in good shape even in the years before the crisis, compared to its counterparts in the OECD high-income countries group. If one looked at the level of the Greek economy's competitiveness in the pre-crisis years (e.g. 2008 and before) s/he would be left wondering how Greece managed to be among the richest countries in the world (the Greek economy ranked, in 2007, 22nd among the 32 OECD high-income countries with respect to the per capita GDP), while lagging so far behind not only almost all of these countries but also many developing ones regarding competitiveness.

The answer to this question came, unfortunately, in the most dramatic way. The level of wealth in the pre-crisis era did not correspond to the level of the economy's competitiveness of the time and it was not backed by the economy's (low) productivity. Rather, it was an economic development (bubble) based on debt and continuous injections of European Union funds that were not channeled to long-term productive investments but to short-term consumption. As a result, the crisis came to balance the disequilibrium between low levels of competitiveness and high levels of wealth.

Back to the table, we see that the only indices that improved in 2015 were those of Innovation and Business sophistication. Indeed, as a recent OECD (2016) report shows,[2] Greece significantly increased its R&D spending from 0.67% of GDP in 2007, to 0.96% in 2015. However, despite this increase the Greek economy still remains much below the EU-28 and the OECD averages, which are approximately 1.4% and 1.8% of GDP, respectively.

Another important and widely used index is the Ease of Doing Business Index (in short, Doing Business) constructed by the World Bank[3] and published every end of October. As its name indicates, it is mostly focused on the business environment and, consequently, it measures the country's attractiveness to investors (both domestic and foreign). Similarly to the WCI, the Doing Business uses data that correspond to the previous of the publication year.

According to this index, Greece fell by one position in 2015 and now ranks 61st among 190 countries from 60th among 189 countries in 2014. There was significant improvement in the period 2009-2014 when Greece moved up to the 60th ranking from the 109th (among 183 countries) in 2009. Table 4.1.2 clearly shows that Greece was performing poorly in the pre-crisis period, which reflects the Greek economy's chronic problem of very low levels of foreign investment. Despite the considerable improvement of the last years, Greece still lags behind all countries with similar economic crises (such as Ireland, Cyprus, Portugal and Spain) and

TABLE 4.1.2 Comparable ranking of Greece based on the Doing Business Index for the period 2006-2015

Countries/year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Number of countries	*178*	*181*	*183*	*183*	*183*	*185*	*189*	*189*	*189*	*190*
Greece	100	96	100	109	100	78	72	61	60	61
Italy	53	65	78	80	87	73	65	56	45	50
Cyprus	-	-	40	37	40	36	39	64	47	45
Spain	38	49	62	49	44	44	52	33	33	32
Portugal	37	48	48	31	30	30	31	25	23	25
Ireland	8	7	7	9	10	15	15	13	17	18

Source: Doing Business (2008-2017), World Bank.

2. <http://www.oecd.org/sti/oecd-science-technology-and-innovation-outlook-25186167.htm>.

3. <http://www.doingbusiness.org/reports>. See following article for a thorough analysis of this index.

needs to further and more quickly improve its investment climate in order to become attractive to domestic and foreign investors. This is the only way out of the economic crisis. Investments will create jobs and economic production will boost exports and economic growth.

Finally, in December of last year (2016) the OECD published the triennial PISA (Programme for International Student Assessment)[4] results of 2015 which assesses students of 15 years old, that is students at the end of the secondary obligatory education system. Greek students' performance worsens continuously and according to the last results Greece ranks 43rd among 72 countries, below the OECD average. Education plays a crucial role in boosting productivity and competitiveness as it directly relates to the level of a culture, education and skills of the country's labor force in the near future. It also relates with another thorny problem of the Greek economy, that of tax evasion and the shadow economy. When tax payers see that their hard-earned tax money spent in public services such as education (health, etc.) do not have the expected results, they are less willing to keep funding these inefficient public services. This means citizens are less willing to pay their taxes.

All the above demonstrate that if Greece is to enter a path of sustainable growth and not, like in the past, a path of unsustainable bubble growth, she has to improve a series of parameters such as: a) quality of institutions (the now time-consuming and inefficient judicial system is a basic part of this), b) trust between the state and its citizens/constituents (this cannot take place as long as the state applies double standards in economic transactions, for example, state debt to a citizen lapses after three years while a citizen's debt to the state lapses after twenty years), c) simplification of the tax law, d) stabilization and consistency of public policies, e) infrastructure improvement, f) access to finance for businesses, g) quality of public services, such as the education system, as well as connection and collaboration between universities and industry (the market in general), and h) decrease the red tape in order for the public administration to become more effective and efficient.

4. <https://www.oecd.org/pisa/>.

4.2. Developments in the regulatory framework of the entrepreneurial activity in Greece

Alexandra Kontolaimou

4.2.1. Introduction

Undertaking entrepreneurial activities requires the existence of a regulatory framework and the application of specific rules and procedures throughout the life cycle of an enterprise. From the early stages of a firm's establishment until its growth, expansion and/or closing down, appropriate systems and structures are necessary to regulate starting the business, access to financial resources, transactions with suppliers/customers from abroad, tax payments, enforcement of the contracts, etc. Regulatory obstacles entailing complicated, time consuming and/or costly procedures in any entrepreneurial phase may discourage or inhibit entrepreneurial endeavours, even those with significant growth prospects.

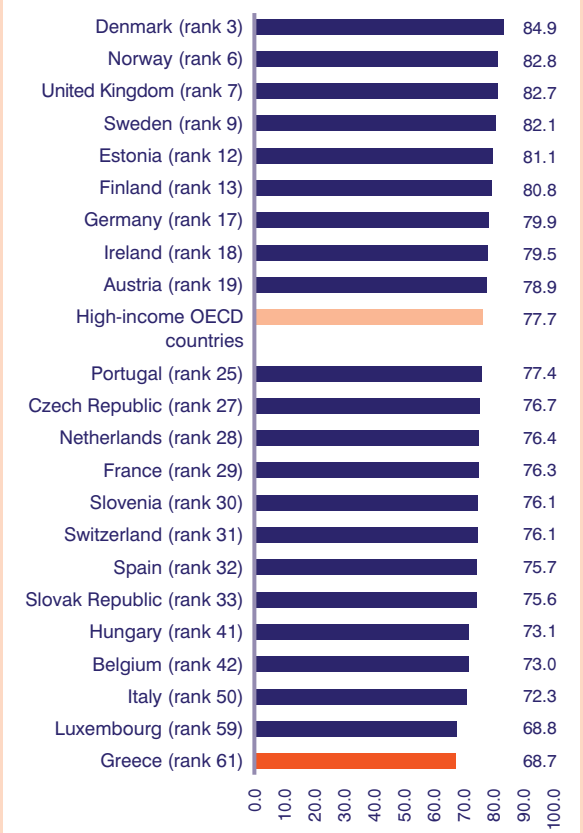
Moreover, the encouragement and support of the entrepreneurial activity serves the development objectives of many economies worldwide. Especially in the case of Greece, facilitating entrepreneurship has become a major priority explicitly linked to the economic recovery and the country's exit from the crisis. However, based on the recent World Bank report, namely *Doing Business 2017* (DB2017),[1] Greece, despite the progress it has made in specific areas, continues to significantly lag behind on the ease of doing business compared to many other economies.

4.2.2. Overall performance on the ease of doing business

In the DB2017 report, 190 countries are scored and ranked based on indicator sets that assess the extent to which the regulatory framework in each country facilitates entrepreneurial activities. The indicators apply to small and medium-sized enterprises (SMEs) at different stages of their life cycle covering 10 main topics: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts and resolving insolvency. The final country ranking is based on an aggregate measure, namely the "distance to frontier" (DTF), which benchmarks economies with respect to regulatory best practice, showing the absolute distance to the best performance. An economy's DTF score is indicated on a scale from 0 to 100, where 0 represents the worst performance and 100 the best, i.e. the frontier.

Figure 4.2.1 shows the overall performance of Greece and other comparator countries (European OECD countries with high income) according to their aggregate DTF score. Country rankings are also reported in parentheses next to the country names. The total score of Greece in the last report is 68.7, being unchanged from the previous evaluation (*Doing Business 2016*).

FIGURE 4.2.1
Ease of doing business - Aggregate DTF indicator



Source: World Bank, *Doing Business 2017*.

Note: The country rankings in parentheses are benchmarked to June 2016 and are based on the average of each economy's distance to frontier (DTF) scores for the 10 topics included in the aggregate ranking.

1. <http://www.doingbusiness.org/reports/globalreports/˜/media/WBG/DoingBusiness/documents/profiles/country/GRC.pdf>.

This score places Greece in the 61st rank among the 190 countries included in the DB2017 report. As shown in Figure 4.2.1, Greece exhibits the worst performance in its country group, lagging by 9 percentage points compared to the high-income OECD average (77.7). This means that relative to the European countries presented in Figure 4.2.1, Greece appears to have the least attractive regulatory framework for doing business. On the other hand, four European high-income OECD countries (Denmark, Norway, the United Kingdom and Sweden) are represented in the ten countries with the friendliest regulatory environment for businesses globally.[2]

4.2.3. Performance on doing business topics

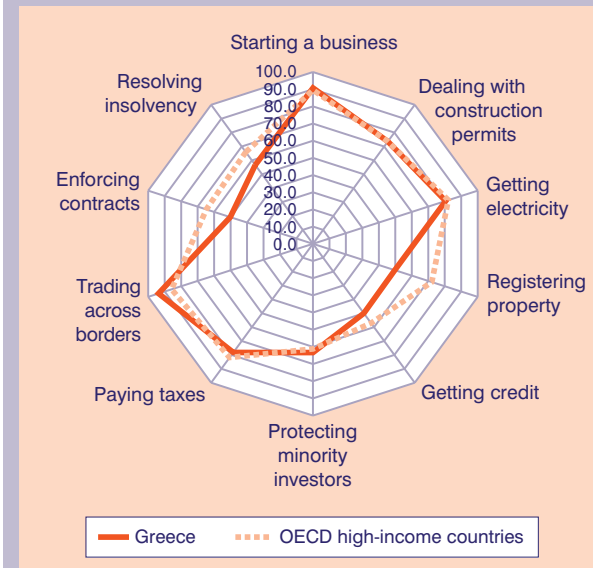
Examining the scores in the 10 topics included in DB2017 aids in identifying the areas in which the regulatory environment obstructs or facilitates doing business in Greece (Figure 4.2.2). Compared with the average level of high-income OECD countries, the regulatory/legal framework in Greece appears to raise significant barriers for SMEs, in particular with respect to registering property and enforcing contracts through the courts. Notably, for a business to purchase property from another business and transfer the property title to the buyer's name, 10 procedures are required in total in Greece (e.g. obtaining a topographic site plan and a relative certificate by the engineer, preparation of the sale agreement by a lawyer, obtaining required certificates from the tax authority and the Social Security Institute, recording the transfer deed at the Land Registry and registering the transfer in the Cadastre) while only 5 are required in the average high-income OECD country. With respect to the contracts' enforcement, resolving a commercial dispute through the courts takes 1,580 days in Greece, while the corresponding time in the comparator OECD countries is, on average, only 575 days.

On the other hand, the regulatory environment for businesses which are engaged in cross-border trade, and especially in importing goods, appears to be relatively favorable in Greece with zero customs clearance and inspection costs in a typical case of imported goods versus $115 in high-income OECD countries.

This picture is confirmed by Table 4.2.1, which presents the rankings of Greece in each of the examined areas compared to countries of the European periphery which faced and/or continue to face serious economic problems (Ireland, Italy, Portugal, Spain, Slovenia), as well as strong economies of the European North (France, Germany, Austria, Belgium, Netherlands). In *registering property*, and *enforcing contracts* Greece has the worst performance, standing at 141 and 133, respectively, in the ranking globally. Transferring property takes an average of 20 days in Greece, while only 1 in Portugal and 2.5 in Netherlands. In the case of contracts' enforcement, resolving a commercial dispute through the courts requires almost quadruple the time (1,580 days) in Greece compared to France (395 days) and Austria (397 days).

However, it is noticeable that Greece stands quite high (rank 29) in the ranking based on the *cross-border trade* indicator, suggesting that the relevant regulatory framework in Greece facilitates more international businesses compared to other OECD countries, like Germany (rank 38), in which documentary and border compliance procedures are more time consuming and costly. The performance of Greece in the *starting business* indicator appears to be relatively good as well, with Greece ranking 56th, while Germany ranks 114th and Austria 111th among the examined 190 economies. To set up a business in

FIGURE 4.2.2
DTF scores on doing business topics



Source: World Bank, *Doing Business 2017*.

Note: The distance to frontier (DTF) scores for the 10 doing business topics are benchmarked to June 2016.

2. The remaining top ten countries are: New Zealand (1st rank), Singapore (2nd rank), Hong Kong (4th rank), Korea (5th rank), the US (8th rank) and FYROM (10th rank).

TABLE 4.2.1 Country rankings based on the doing business indicators

Indicator	Greece	Ireland	Italy	Portugal	Spain	Slovenia	France	Germany	Austria	Belgium	Netherlands	Best performer
Overall DTF	61	18	50	25	32	30	29	17	19	42	28	New Zealand
Starting a business	56	10	63	32	85	49	27	114	111	17	22	New Zealand
Dealing with construction permits	58	38	86	35	113	80	20	12	49	44	87	New Zealand
Getting electricity	52	33	51	50	78	16	25	5	20	60	45	Korea
Registering property	141	41	24	27	50	34	100	79	30	131	29	New Zealand
Getting credit	82	32	101	101	62	133	82	32	62	101	82	New Zealand
Protecting minority investors	42	13	42	70	32	9	32	53	32	63	70	New Zealand
Paying taxes	64	5	126	38	37	24	63	48	42	66	20	United Arab Emirates
Trading across borders	29	47	1	1	1	1	1	38	1	1	1	15 Economies*
Enforcing contracts	133	90	108	19	29	119	18	17	10	52	71	Korea
Resolving insolvency	52	17	25	7	18	12	24	3	20	10	11	Finland

Source: World Bank, *Doing Business 2017*.

* Austria, Belgium, Croatia, Czech Republic, Denmark, France, Hungary, Italy, Luxembourg, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain.

Greece, initial minimum capital is no longer required while the corresponding cost for a start-up in Germany is 33% of income per capita in the country. Moreover, starting a business in Greece takes 13 days while in Austria the required procedures are completed in 21 days.

Looking at the evolution of these indicators over time (Table 4.2.2), we observe that the performance of Greece seems to have significantly improved in most cases in 2013 or 2014. Indicatively, the *starting business* indicator appears to increase from 78.57 in 2012 to 89.22 in 2013 when minimum capital requirements were abolished in the case of starting a simpler form of a limited liability company. Also, the *cross-border* trade indicator presents a 13 percentage point increase between 2013 and 2014 probably due to the implementation of a system allowing electronic submission of customs declarations for exports. However, during the last three years (2014-2016) minor or no changes are observed in the aggregate indicator as well the indicators referring to the examined topics.

Compared to 2015, the country's DTF scores in 7 out of 10 areas included in DB2017 remained unchanged. A small decrease was recorded in the *paying taxes* indicator (78.22% from 78.65%) potentially reflecting the recent increase in the corporate tax rate. On the other hand, the indicator of *registering property* was slightly increased, probably as a result of the reduction of the property transfer tax and the removal of the requirement for the municipal tax clearance certificate. Moreover, recent major reforms have taken place in Greece in the area of *enforcing contracts* by introducing tighter rules on adjournments, imposing deadlines for key court events and limiting the recourses that can be lodged during enforcement proceedings. However, the related indicator does not appear to improve since other countries seem to have also made reforms that facilitate the enforcement of contracts through the courts.

TABLE 4.2.2 Ease of doing business in Greece, 2010-2016

Indicator	2010	2011	2012	2013	2014	2015	2016
Overall DTF	60.42	60.66	62.66	63.35	68.56	68.67	68.67
Starting a business	70.78	78.72	78.57	89.22	90.71	90.70	90.70
Dealing with construction permits	69.96	67.45	71.57	71.53	73.63	73.63	73.63
Getting electricity	78.31	78.31	78.29	78.28	80.57	80.57	80.57
Registering property	42.44	42.44	43.16	43.14	49.62	49.62	49.67
Getting credit	56.25	56.25	56.25	56.25	50.00	50.00	50.00
Protecting minority investors	33.33	33.33	46.67	53.33	63.33	63.33	63.33
Paying taxes	78.34	78.71	80.74	81.29	77.89	78.65	78.22
Trading across borders	77.21	77.30	79.31	80.30	93.72	93.72	93.72
Enforcing contracts	51.02	49.11	48.02	43.65	50.19	50.19	50.19
Resolving insolvency	23.27	22.48	21.99	55.78	55.98	56.28	56.66

Source: World Bank, *Doing Business* reports, 2011-2017.

4.2.4. Conclusions

The implementation of innovative business ideas and entrepreneurial new ventures with high value added presupposes the existence of an efficient regulatory framework that will encourage and support entrepreneurial activities at all stages. Many of the reforms implemented by Greece in recent years have significantly facilitated doing business, especially with regard to starting a business and conducting cross-border trade. However, the country ranks last among the high-income OECD countries based on the aggregate indicator of the ease of doing business in the World Bank's *Doing Business 2017* report. The Greek regulations seem to result in increased bottlenecks reflected in large numbers of procedures, long delays or high costs, principally in the areas of property transfers and the enforcement of the contracts through the courts.

Overall, we conclude that despite the significant progress in facilitating entrepreneurial activity, there is substantial room for further improvement in Greece, especially with respect to property registration and contract enforcement. Thus, more structural reforms are considered necessary for the country to create an essentially friendly regulatory environment that will encourage investments and innovative new ventures.

4.3. Review of the recent developments in the Greek heating oil market

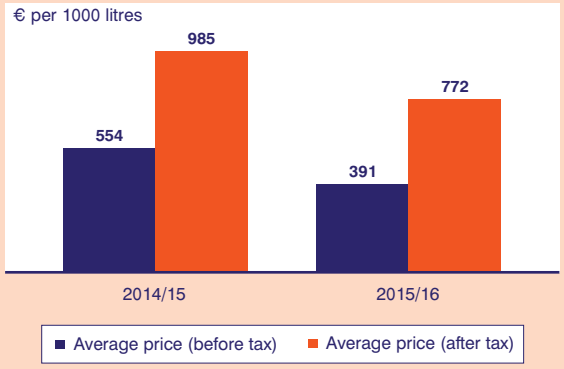
Vassilis Lychnaras

Recently, the trend of the international oil prices, the changes in fuels taxation and the government benefit for heating oil, have again started the debate on the evolution of the heating oil prices. In this context, this work presents a brief overview of the recent developments, as well as a short discussion over the factors that significantly affect the specific market. The analysis of this article is based on ongoing KEPE research regarding the assessment of the impact on the state revenues from the changes in the excise duty of heating oil. This work is performed by the researchers of KEPE: V. Lychnaras, E. Nitsi and Ch. Triantopoulos.

4.3.1. The evolution of heating oil prices for the periods 2014/15 and 2015/16

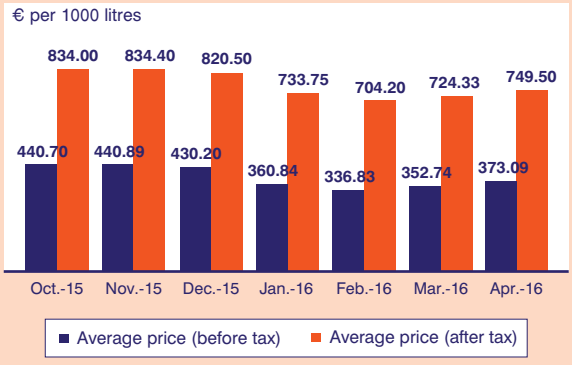
As known, the sale of heating oil is performed during the period between October and April of next year. For this reason, the analysis takes into account the specific time period and it is mainly focused on the previous two periods, 2014/15 and 2015/16. Regarding the evolution of the prices, the average annual price of the period between October 2015 and April 2016 decreased compared to the corresponding price of the previous period. More specifically, as shown in Figure 4.3.1, the price before tax of the period 2015/16 decreased by 29%, while the price after tax decreased by 22%, compared to the already reduced prices of the previous period, 2014/15. The price before tax depends directly on the international oil prices, while the price after taxes includes taxes and other charges, but mainly the excise duty and the VAT. According to this, since the specific fuel tax rates remained stable between these periods,[1] the main reason for the decrease of the prices seems to be the decrease of international oil prices. Additionally, Figure 4.3.2 records the monthly price trend for the period 2015/16. We can see that until February 2016, there is a downward trend of the prices before and after tax.

FIGURE 4.3.1
Average price of heating oil



Source of primary data: European Commission, Energy, Market observatory & Statistics, *Oil bulletin* (http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm).

FIGURE 4.3.2
Average monthly price of heating oil for 2015/16



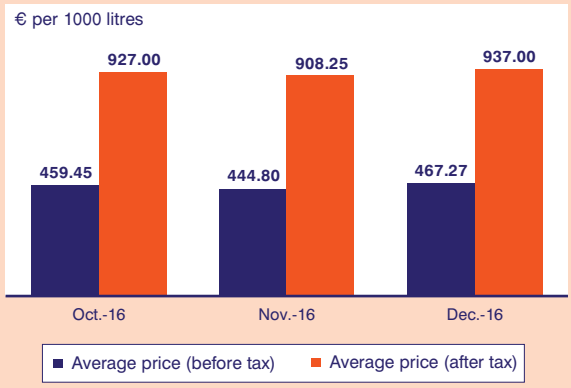
Source of primary data: European Commission, Energy, Market observatory & Statistics, *Oil bulletin* (http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm).

4.3.2. The evolution of the prices before and after tax, for the current period 2016/17

For the current period, which started in October 2016, the excise duty of heating oil increased from 230 to 280 euro per 1000 litres, while the VAT rate is already increased to 24%. This increase in tax rates, together with the upward trend of oil prices, led to the rise of the consumer's heating oil prices. Indicatively, Figure 4.3.3 shows the average monthly prices before and after tax, during the first three months of the current period. We observe that in October 2016 prices both

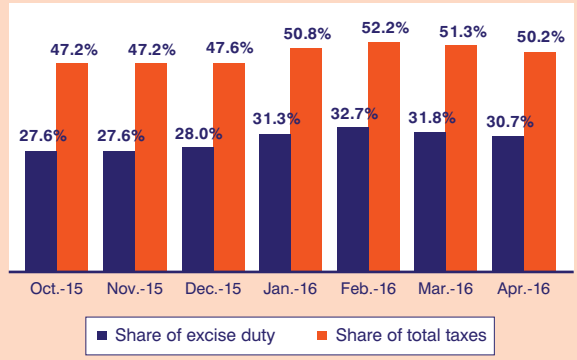
1. In particular, the excise duty was 230 euro per 1000 litres and the VAT rate was 23%.

FIGURE 4.3.3
Average monthly price of heating oil for 2016/17



Source of primary data: European Commission, Energy, Market observatory & Statistics, *Oil bulletin* (http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm).

FIGURE 4.3.4
Average monthly share of taxes in the final price, for 2015/16



Source of primary data: European Commission, Energy, Market observatory & Statistics, *Oil bulletin* (http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm).

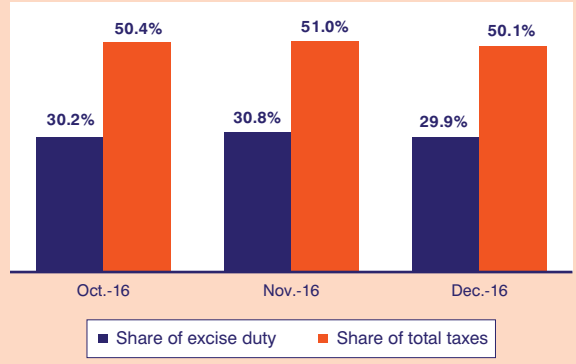
before and after tax increased by 19% compared to the respective prices at the end of the previous period (April 2016). Also, we see that at the end of the year the prices show a slight increase, affected by the international oil price trend.

4.3.3. The share of taxes in the final price of heating oil

As known, there is a debate about the share of taxes on the final price of liquid fuels. Based on Figure 4.3.1, we can calculate that in 2014/15 total fuel taxes accounted for 44% of the final average annual price of heating oil and this share increased to 49% for the next period, 2015/16. Respectively, the share of the excise duty was 23% in 2014/15 and increased to 30% for 2015/16. Since the tax rates were stable, this increase of the tax share is the result of the decrease of the price before tax, due to the downward trend of international oil prices. Additionally, Figure 4.3.4 presents, on a monthly basis, the evolution of the share of taxes in the final price during the previous period 2015/16. We note that since January 2016 the share of taxes has increased as a result of the reduction of price, as presented before in Figure 4.3.2.

On the other hand, it is also interesting to examine the effect of the last increases of the excise duty and the VAT for the current 2016/17 period. As presented in Figure 4.3.5, during the last three months of 2016, despite the increase of taxation rates for the heating oil, the share of the excise duty, as well as the share of total taxes on the final prices remained stable compared to the end of the previous period. This is a result of the

FIGURE 4.3.5
Average monthly share of taxes in the final price, for 2016/17



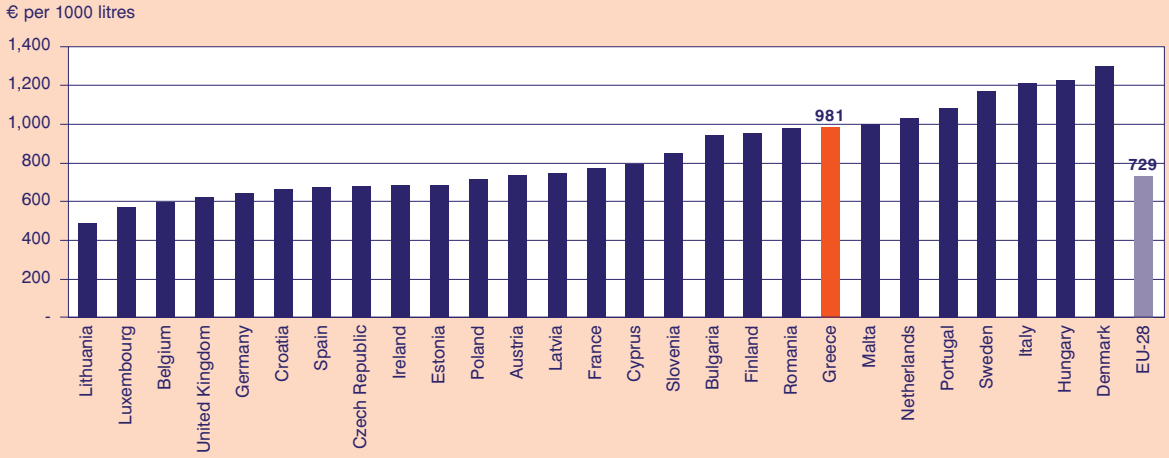
Source of primary data: European Commission, Energy, Market observatory & Statistics, *Oil bulletin* (http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm).

simultaneous increase of international oil prices, which led to the rise in prices before tax (as shown in Figure 4.3.3). In this case, even though there was a significant burden in the final price for the customer, the share of taxes did not change.

4.3.4. The comparison between Greece and the other EU countries

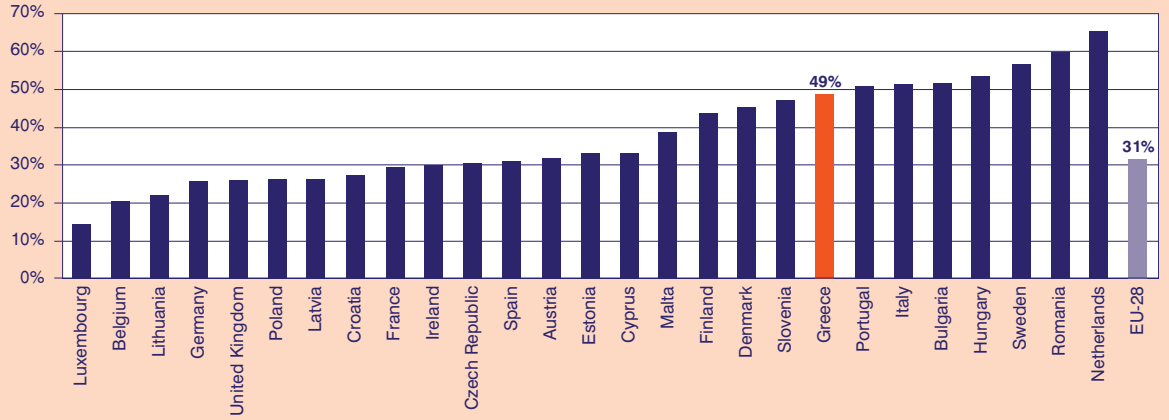
It is often argued that the prices of heating oil in our country, as well as the share of taxes in the final price, are among the highest in the EU. Figures 4.3.6 and 4.3.7 present the respective figures for Greece compared to the other EU countries, as well as the EU

FIGURE 4.3.6
Final selling price of heating oil in EU countries (January 2, 2017)



Source of primary data: European Commission, Energy, Market observatory & Statistics, *Oil bulletin* (http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm).

FIGURE 4.3.7
Share of taxes on the final price of heating oil in EU countries (January 2, 2017)



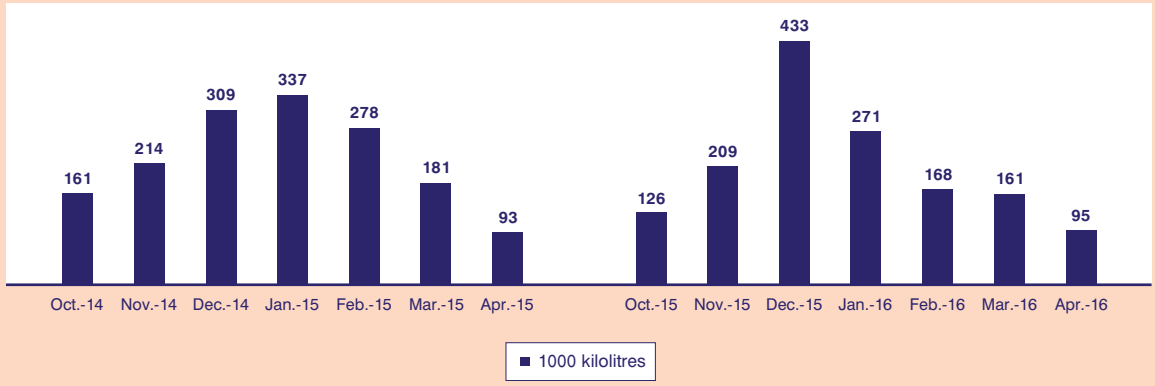
Source of primary data: European Commission, Energy, Market observatory & Statistics, *Oil bulletin* (http://ec.europa.eu/energy/observatory/oil/bulletin_en.htm).

average. The values presented in the figures are only indicative, since they are based on the latest available prices of January 2, 2017. We observe that the average price in Greece is actually much higher than the EU-28 average and quite a bit more expensive than most EU countries. However, it seems that there are countries that reported much higher selling prices of heating oil. We also get similar results for taxation. In our country, the 49% share of taxes is much higher than the 31% EU-28 average. However, there are also other countries with a higher share, such as the Netherlands, where the taxation in heating oil reaches 65% of the price.

4.3.5. The evolution of heating oil consumption for 2014/15 and 2015/16

As mentioned, in 2015/16 the selling price of heating oil in our country decreased significantly, mainly due to the downward trend of international oil prices. According to this, one should expect that the demand for heating oil would be increased for the same period. On the other hand, as illustrated in Figure 4.3.8, this has not been confirmed, since the total consumption of 2015/16 (1,463 thousand kilolitres) reduced by 7% compared to the consumption of 2014/15 (1,573

FIGURE 4.3.8
Monthly consumption of heating oil



Source of primary data: Ministry of Finance.

thousand kilolitres). In this case, not only the price, but also the weather was another important parameter that affected consumption. More specifically, the analysis in the context of the extended work for heating oil, mentioned in the beginning of this article, concluded that favorable weather conditions during the 2015/16 winter period minimized the demand for heating. However, in December 2015 the recorded consumption was significantly higher compared to December 2014, a fact that it is also related to the weather conditions of the specific month. Therefore, we have to note that apart from the price, there are also other very important factors that affect the demand for heating oil and for this reason an in-depth analysis of the market is needed before any political decisions on fuels taxation are taken.

The evolution of the manufacturing sector in the period 1995-2013

John Chalikias*

1. Introduction

The sectoral analysis of the Greek economy both at static (input-output tables) and at dynamic levels (estimating macroeconomic models) is one of the main concerns of economists. Thus, many sectoral studies have been made in the past concerning the analysis of economic fundamentals such as consumption, investments, employment, etc.

This article seeks to fill a gap present in the literature in examining the performance of Greek manufacturing in conjunction with the main determining factors thereof, such as competitiveness, investments and labour productivity. Greek industry achieved its best performance in the 1970s when it participated in the GDP with approximately 20% and around 400,000 employees, or 12% of all employees. Today, the participation percentage of manufacturing in the GDP has been reduced to 5.4% with 168,000 jobs, or 4.5% of total employment.

The aim of this paper is not the estimation of dynamic models, but monitoring through appropriate indicators the evolution of the performance and competitiveness of Greek industry during the last twenty years in order to investigate the causes of the manufacturing industry's decline. However, the estimation of such econometric relationships between different variables is now of secondary importance, since the first step is the construction of single sets, which is the subject matter of the article.

More specifically, based on the updated data of the Hellenic Statistical Authority (ELSTAT) covering the period 1995-2013, the evolution of manufacturing economic fundamentals (investments, value added, employment, etc.), the export performance and the evolution of competitiveness are analysed. By competitiveness we mean measurable factors, i.e. labour costs per unit of product and labour productivity in manufacturing.

The Export Research Centre (KEEM) has published similar studies on measuring the competitiveness of Greek manufacturing, first for the entire industry and later for individual sectors [1], [2]. The main cause for the delay of the analysis at the sectoral level was the lack of sectoral data with regard to employment, wages, etc. These data, although collected by the then National Statistical Service of Greece (ESYE), showed a lag in the time of their publication. However, thanks to the concerted efforts of ESYE and the Foundation for Economic and Industrial Research (IOBE), these data, after digitisation and proper processing, were consolidated into complete single sets covering the period 1961-1992 with all fundamentals both for the entire industry and the basic, industrial sectors, at a two-digit level, thus enabling a first sectoral approach [3].

This article refers only to the large industry enterprises (average annual employment over 10 people) and is based on the revised data of the Hellenic Statistical Authority (ELSTAT) [6]. In particular, during the period 1995-2007, the manufacturing activity is broken down into 23 sectors according to the European System of *National Accounts* (NACE Revision 1.1), and for the period 2008-2013 into 24 sectors according to the newest Community Classification, (NACE Revision 2).

The lack of sectoral studies on the export performance of Greek industry is also due to another important reason: the lack of matching between the classification systems of foreign trade and industrial activity. More specifically, in foreign trade the products are classified by either their use (food, raw materials, etc.) or the raw material they are made of (chemical products, manufactured goods classified mainly by raw material, etc.). Thus, the products are recorded based on the Standard International Trade Classification (SITC, Version 4.0). In contrast, in industry the products are classified based on the industrial sector producing them (outputs). It is therefore immediately understood how difficult it is to match the five-digit codes of the Standard In-

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ternational Trade Classification (SITC) system and the three-digit codes of the classification system of industrial sectors (NACE), which is partly covered by the Eurostat publications [7].

2. Fundamentals of manufacturing

Investments made by industrial enterprises are a basic prerequisite for creating the industrial base of a country and expanding it through the establishment of large production units. Diagram 1 shows the total gross investments made by the large industry enterprises (average annual employment 10 people or more) in the period 1995-2013. The period 1995-2000 is characterized by high growth rates of investment in almost all industrial sectors, followed by a downtrend in the next five years up to 2005 and a small recovery in 2006 and 2007. The spectacular increase in investments in 2008 is due to investments in the sectors of Oil & Coal and Chemical & Pharmaceutical Products. The investments in both these sectors increased almost fivefold in 2008 and represent 41.5% of total investments. The consecutive decline in manufacturing investments begins from 2008 as a result of the country's economic crisis. Based on the currently available data, from 2008 up to 2013 investments decreased by -60%.

Investments come mainly from large industrial enterprises and pertain to new technologies and automatisms so they do not necessarily mean establishing new enterprises or new jobs. Diagram 2 illustrates the evolution of the number of manufacturing enterprises in the period 1995-2013. Since the mid-90s, a consecutive decrease in the number of industrial enterprises is noted and continues until 2005 with a loss of 2,438 manufacturing units. A four-year period, 2005-2009, follows with an upward trend in the establishment of new enterprises as a result of the incentives established at that time for companies (reduction of corporate taxes, creating tax-free reserves, etc.). The favourable climate led to the establishment of new manufacturing units and from 3,376 in 2005, they rose to 4,098 in 2009. The economic crisis that followed, in conjunction with the political uncertainty and tax increases, led to the cessation of operations for a significant number of enterprises, which fell to 2,845 in 2013.

The evolution of the number of employees in manufacturing presents a similar picture. Cumulatively over the period 1995-2013, 81,653 people lost jobs in manufacturing, a decrease of -32.7%. The only period when a slight increase in the number of employees is noted is the period 2005-2009, during which the number of new enterprises also increases.

Finally, with regard to the gross manufacturing output, there is a high growth rate in the period 1995-2008 (Diagram 3). Specifically, the gross output increased in total by 146.3% with an average annual growth rate of +6.9%. The picture is similar for the evolution of the value added of manufacturing with a cumulative increase of 98.5% and an average annual growth rate of +5.4%. After 2009 the picture changes. The gross output in 2009 decreased significantly by -18.4%

DIAGRAM 1
Total investments in manufacturing (€ million)

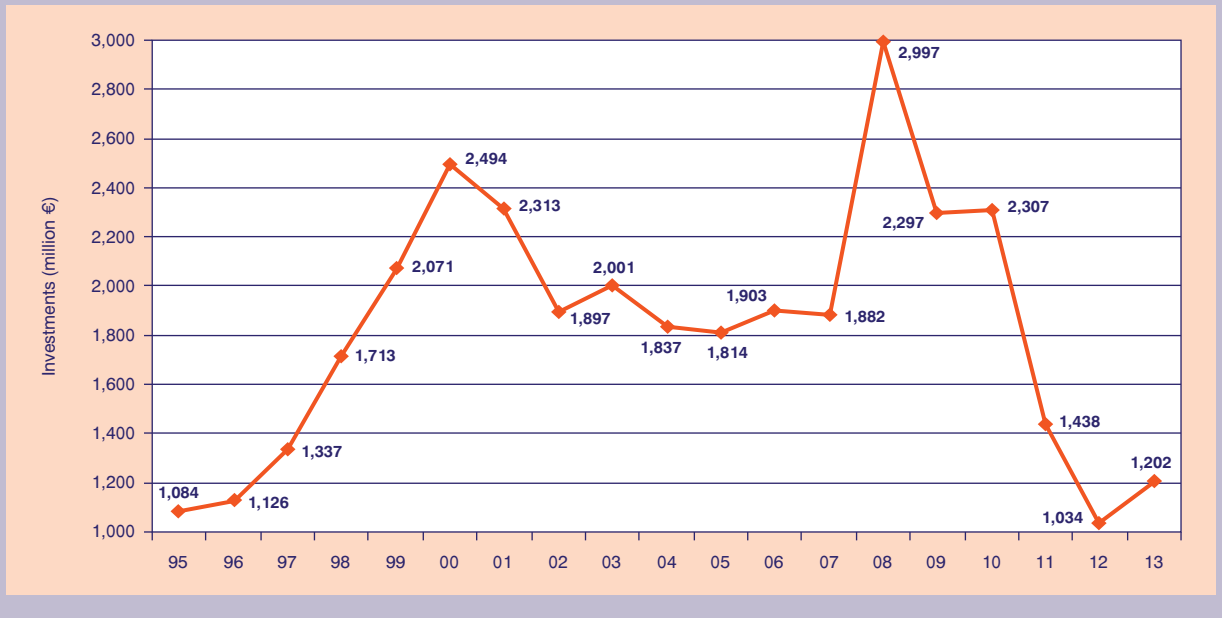


DIAGRAM 2
Number of enterprises (over 10 people) and number of employees in manufacturing

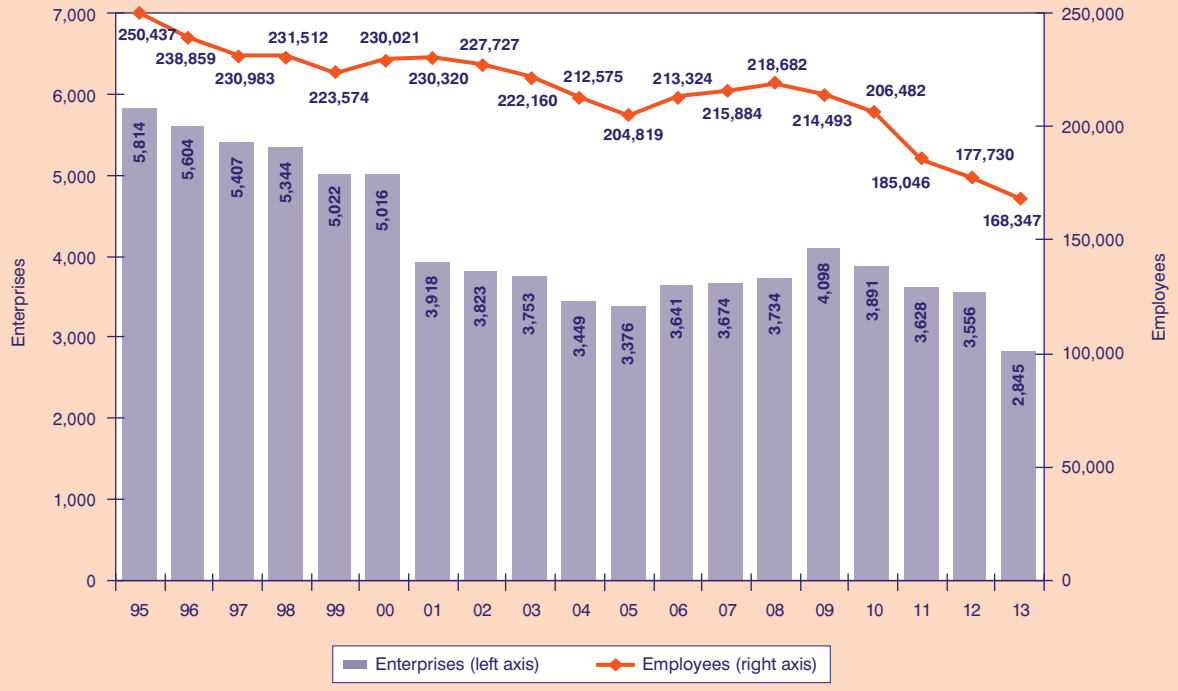
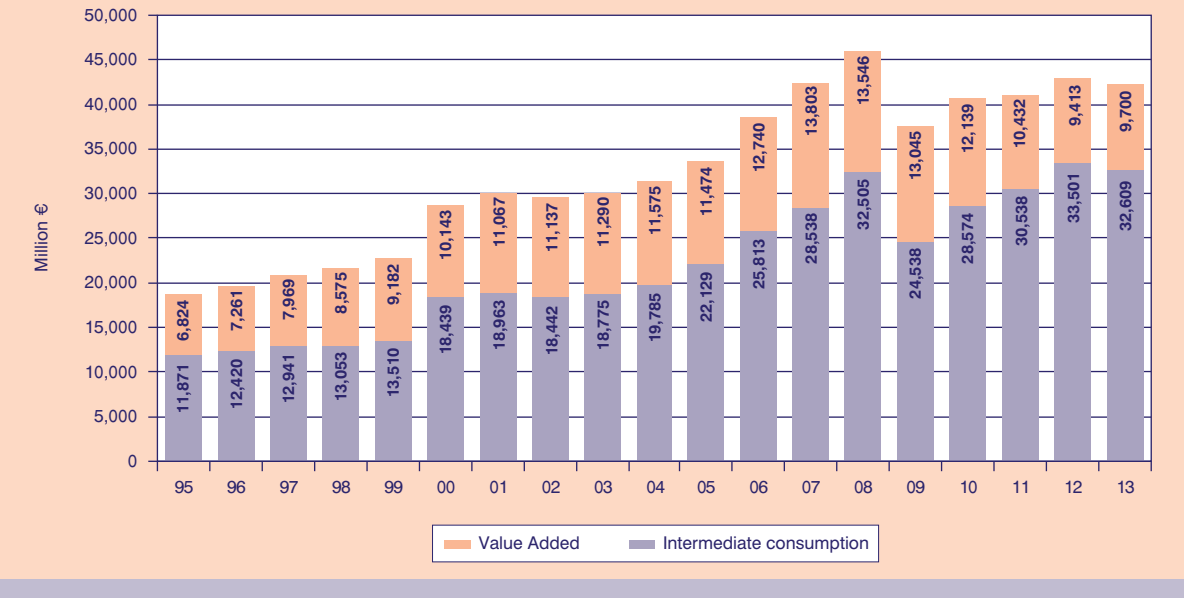


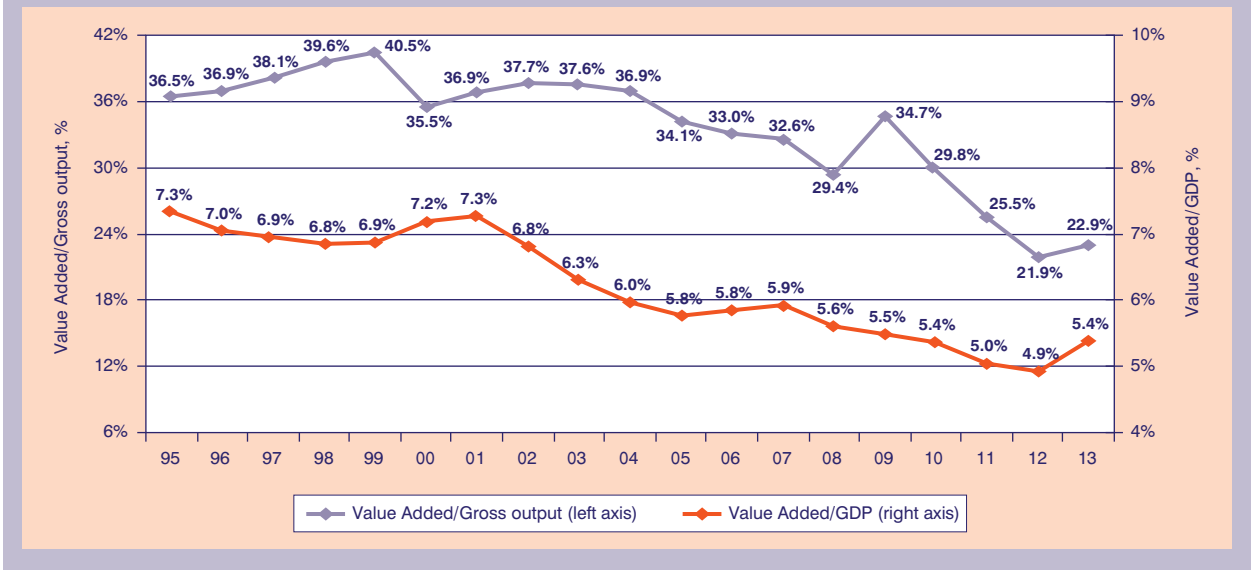
DIAGRAM 3
Gross manufacturing output (€ million)



and then changed to a positive but low growth rate (+1.6%). In contrast, the value added of manufacturing shrank drastically with a cumulative decrease of -28.4% in the period 2008-2013, i.e. an average growth rate of -7.7%. The main reason for the decrease of value added in the period 2008-2013 is the collapse of investments mentioned above, resulting in the replacement of inputs (intermediate consumption) from domestic sources with inputs from abroad.

The result of these developments is the decrease in recent years of both the gross output, consisting of the value added, and the contribution of the

DIAGRAM 4
Participation of manufacturing output Value Added (%)



manufacturing sector in the Gross Domestic Product (GDP). Diagram 4 illustrates the evolution of these two indices.

In the period 1995-2004 the value added was approximately 36%-40% of the gross manufacturing output. Since 2005, this percentage has constantly decreased, falling to 22% and 23% in 2012 and 2013, respectively. The evolution of manufacturing participation in the GDP presents a similar picture. Over the period 1995-2001, the percentage of GDP coming from the manufacturing sector was about 7%. Since 2002, the participation percentage has constantly decreased, falling to 4.9% and 5.4% in 2012 and 2013, respectively.

3. Efficiency indices of manufacturing

The key index for measuring the manufacturing sector's efficiency is the industrial production index. Diagram 5 illustrates the evolution of the industrial production index and the Gross Domestic Product (GDP-volume index) over the period 1995-2015 (provisional data). The shortfall of the industrial production growth rate compared to the growth rate of GDP is apparent.

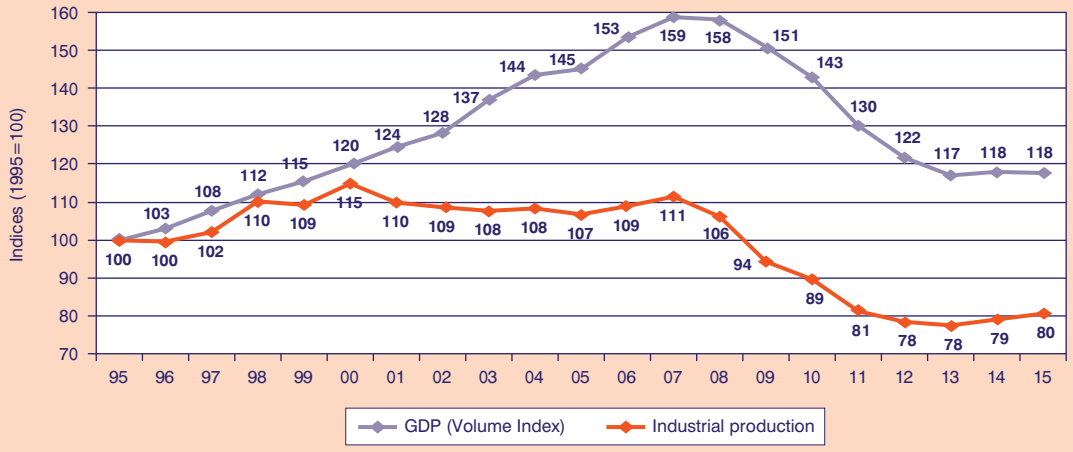
In particular, during the pre-economic crisis period, 1995-2007, the average annual growth rate of GDP was +4.0% and of the industrial production index, just +0.6%. Since 2008, the year that the first recession by -0.4% occurred, up to 2013, the average annual growth rate of GDP was -5.5% and of industrial production -6.3%. Thus, cumulatively over the period 2008-2013, GDP shrank by -26.4% and industrial production by -30.3%. Finally, in the years 2014 and 2015, GDP changed by +0.8% and -0.2% and industrial production index by +1.8% and +1.9%, respectively. It follows from the above that, unlike GDP, which over the period considered (1995-2015) increased by +17.6%, industrial production declined by -19.5%.

What are the causes of the decline in industrial production? What had such a negative impact on manufacturing which for years is characterized by a lack of investments, a decrease in the number of manufacturing units, and production shrinkage, leading to the deindustrialisation of the country? The answer is simple: the loss of competitiveness of the manufacturing sector.

The term "competitiveness" includes qualitative and quantitative characteristics. Qualitative characteristics are, for example, product quality, timely delivery, constant presence in the international market, etc. The quantitative aspect of competitiveness, which is examined in this article, pertains to two measurable factors that, according to international practice, are the most important ones, i.e. labour cost per product unit and labour productivity in manufacturing. These two indices measure an enterprise's competitiveness both in absolute terms, i.e. whether the enterprise improves, and in relative terms, i.e. whether the enterprise improves its competitiveness faster than its competitors.

In the case of manufacturing where enterprises promote their products abroad, in addition to the interior of the country, another measurable factor is the price

DIAGRAM 5
Gross Domestic Product (Volume Index) and the industrial production Index (1995=100)



of exported products. However, the export price index (either as an absolute or relative index, i.e. export prices compared to competitors' prices) has decreased reliability as a competitiveness measure for the following reason. Producers, in their effort to sell their products, raise prices less than the rate of increase in production costs (and therefore less than the decrease in competitiveness), thus squeezing their profits. Also, if the internal costs increase disproportionately, Greek exporters may not be able to sell at the price level shaped by international competition, since these prices cannot cover the production costs, resulting not only in not being competitive, but literally in being excluded from the international, and sometimes the internal, market. Thus, the level at which export prices are formed following a change in the internal costs of the enterprise is only of a complementary character in the way of measuring competitiveness. The main factors of competitiveness must be sought in the internal costs of enterprises and this is measured, to a satisfactory extent, by labour costs per unit of output. In modern industry the main cost factors are approximately the same worldwide (oil, raw materials, production methods, machinery, etc.), resulting in the labour costs being the main differentiating factor of production costs, prevailing as the main measurement index of manufacturing competitiveness.

The labour cost index per unit of output (or unit labour cost index-ULCI) arises from the relationship (total labour costs)/(production volume). With regard to competitor countries, the comparison of labour costs was limited to the European Union (EU). In order to facilitate the comparison between the change in unit labour costs of Greek manufacturing and the change in unit labour costs in the EU countries, a relative index has been constructed, which represents the quotient obtained by dividing the unit labour cost index of Greek manufacturing by the respective index of competitor countries. Thus, an increase in the relative index means that the unit labour cost in Greek manufacturing increases more than the unit cost in the manufacturing of our competitors and, therefore, the competitiveness of Greek manufacturing products decreases and vice versa. This relative index of unit labour costs has been calculated in a common currency (ECU) for the period before the euro.

Diagram 6 illustrates the decline suffered by the competitiveness of the Greek manufacturing sector during the period 1995-2011. The Unit Labour Cost Index (ULCI) increased cumulatively by 86% with an average annual growth rate of +3.9%, when the respective ULC index in the EU countries increased at an average annual rate of 1.9%. This resulted in Greek products becoming, cumulatively, 43% more expensive, in relative terms, than the products of our competitors. It is worth noting that, based on a previous study of the Exports Research Centre, the EU countries represent about two-thirds of the total competition faced by Greek products in international markets [4], [5].

The decrease in wages and salaries imposed by the creditors with the adjustment programmes led to a decrease of ULC and an improvement of the Relative ULCI in the years 2011-2013, offsetting about 50% of the loss of competitiveness of Greek products.

The main reasons for the increase in unit labour costs, and therefore the decline in competitiveness, are the significant increase in wages and salaries and the disproportionately small increase in the production volume in manufacturing. In other words, the increase in

DIAGRAM 6
Unit labour costs indices in manufacturing (1995=100)

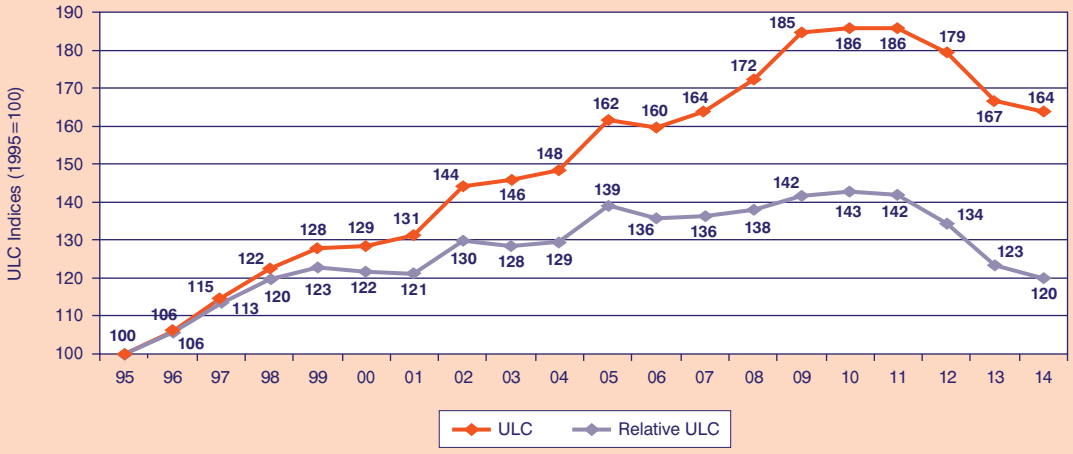
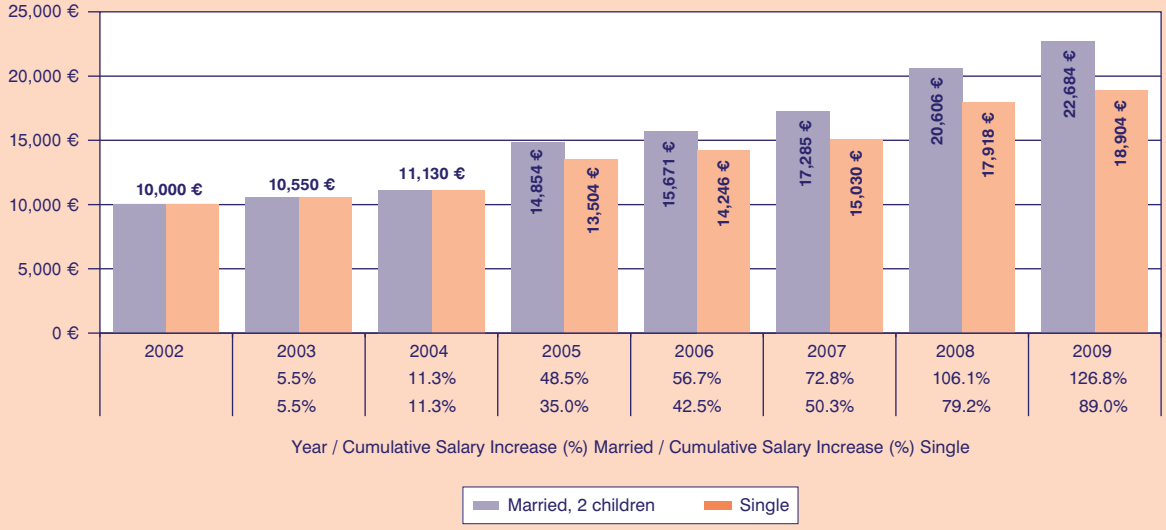


DIAGRAM 7
The evolution of labour cost in the period 2002-2009



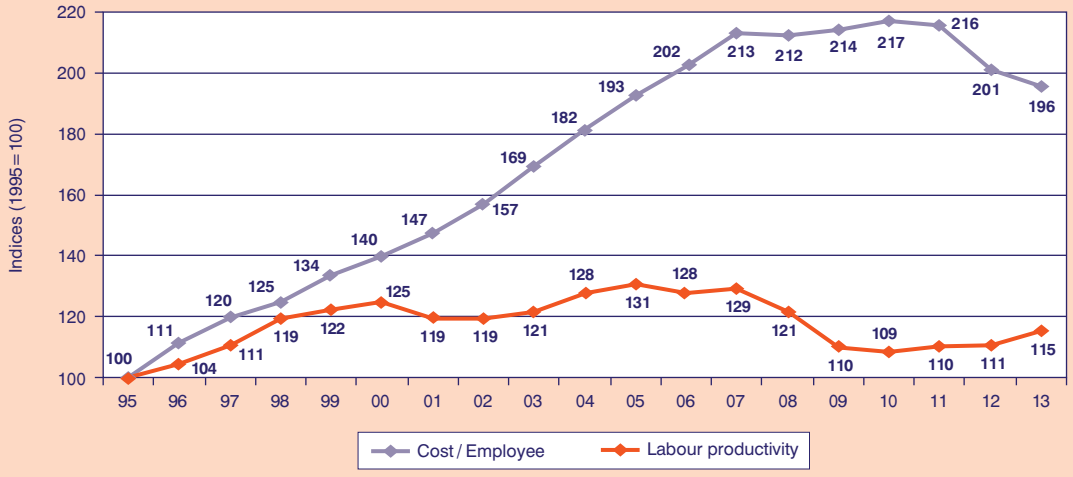
Assumptions:
1. Minimum salary: € 556.04. Annual labor cost: € 556.04 × 14 + 28.46% employer contribution = € 10,000.00.
2. Average annual growth rate of minimum salary under the National Collective Agreements: 5.5%.
3. Maturity allowance: 15% first 3 years, 13% second 3 years.
4. Marriage allowance: 10%, allowance / child: 5%.
5. Marriage: year 2005, first child: year 2007, second child: year 2009.

unit labour costs is the result of two opposing varying sizes: labour compensation and its productivity.

For example, on the hard Euro era and before the crisis, 2002-2009, the basic labour cost in manufacturing almost doubled (average annual increase of National Collective Contracts +5.5%, maturity allowance 15% in the first 3-year period, 13% in the second 3-year period, 10% in the following four 3-year periods, 10% marriage allowance, 5% child allowance, etc.), leading to the collapse of manufacturing because the increase of productivity was clearly smaller than the increase of labour costs as detailed below.

Diagram 7 shows the evolution of the annual wage cost of an unskilled worker in the period 2002-2009 (7 years) which, for comparison purposes, was normalized so that the annual labour cost in 2002 equals € 10,000.00. Based on the above assumptions, the basic annual wage costs in the period 2002-2009

DIAGRAM 8
Average annual costs and labour productivity indices in manufacturing (1995=100)



increased by +89% for unmarried persons and by +126.8% for married persons with two children.

The labour cost index per unit of output (or unit labour cost index-ULCI) is estimated according to the following formula:

$$\text{ULCI} = \frac{(\text{Number of employees index}) \times (\text{Compensation index})}{\text{Production volume index}}.$$

The numerator expresses the total wage costs and the denominator the production volume. This results in an index that measures labour costs per one unit of output over time.

Also, the index of labour productivity equals:

$$\text{Productivity Index} = \frac{\text{Production volume index}}{\text{Number of employees index}}.$$

It follows from the above that: The more the labour costs per unit of output decrease, the more the enterprise's competitiveness increases and vice versa. Also, the more the production volume per employee increases, the more productivity increases and vice versa.

An alternative way of measuring the Unit Labour Costs arises from the above relationships:

$$\text{ULCI} = \frac{\text{Compensation index}}{(\text{Production volume index}) \,/\, (\text{Number of employees index})} =$$

$$= \frac{\text{Compensation index}}{\text{Productivity index}}.$$

In other words, the Unit Labour Costs Index equals the Labour Compensation Index divided by the Labour Productivity Index. This means that if productivity increases more than labour costs, then ULCI decreases and hence competitiveness improves and vice versa.

Diagram 8 illustrates the evolution of the average annual costs per employee as well as the productivity index of Greek manufacturing. Now it becomes clear why the unit labour costs increased excessively. The average annual costs per employee in the period 1995-2010 increased by 117% while productivity improved only by 9%. All of the scientific institutions of the country (KEPE, BoG, IOBE, PSE, etc.) warned the social partners (SEB, GSEE, etc.), starting in 2000, when Greece was ascending to the Eurozone, that joining the single currency would deprive Greece of setting its own national monetary policy, by which it could offset the loss of competitiveness caused by the increase of wages and salaries through devaluations of the national currency, as it had done in the past. The constant erosion of competitiveness resulted in the shrinkage of several manufacturing sectors, especially those characterized as labour-intensive sectors (textiles, furniture and other manufacturing activities, clothing, footwear & travel goods).

4. The export performance of manufacturing

In developing economies, exports are the main driver of industry growth, since through the applied economies of scale they improve their competitiveness leading to the further increase of production and the expansion of exports. Greek manufacturing followed this rule and the openness of the industry began from the early years of the country's industrialization. In partic-

DIAGRAM 9
The extroversion of Greek manufacturing (1995-2013)

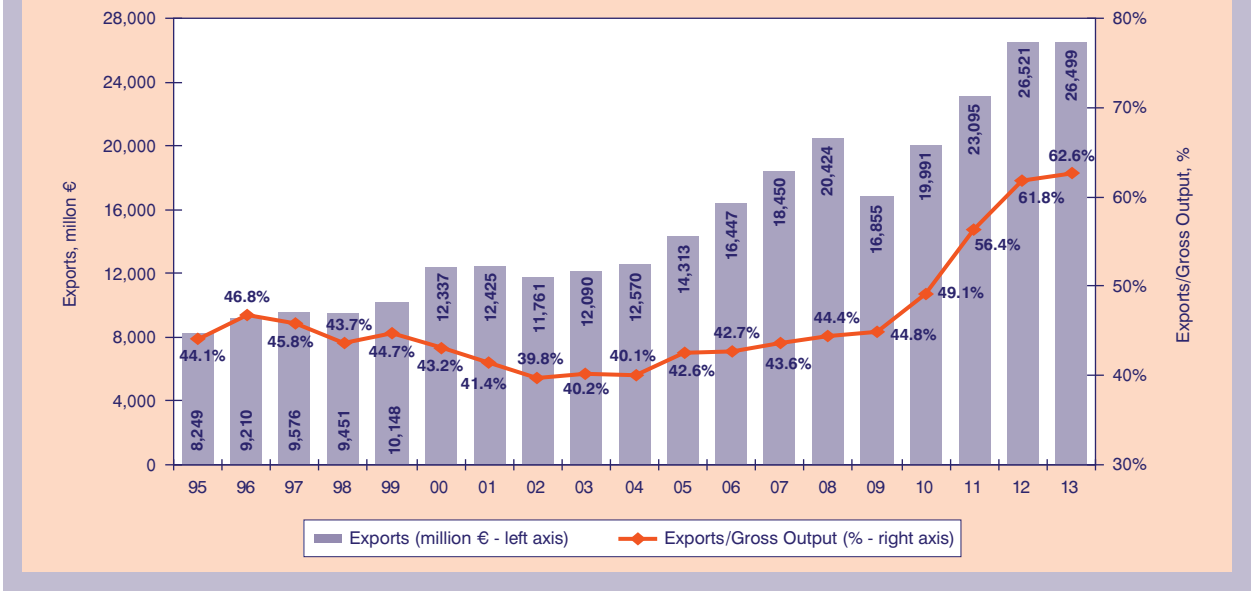
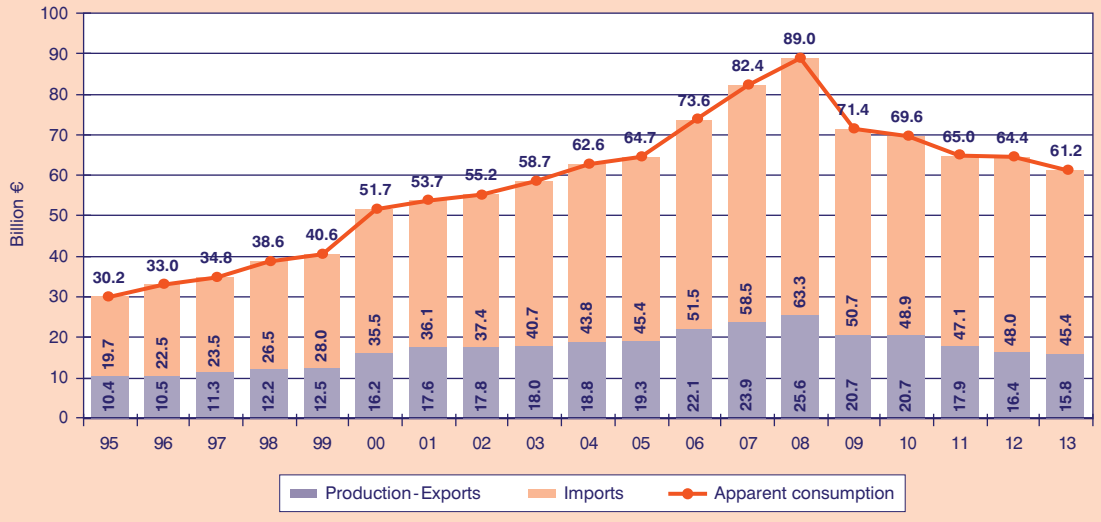


DIAGRAM 10
Apparent domestic consumption (1995 - 2013)



ular, in the recent years that our country is plagued by the economic crisis and domestic consumption has continuously shrunk, exports have become the only solution for the survival of manufacturing enterprises. Diagram 9 illustrates how much the openness of Greek manufacturing has increased during the years of crisis.

Extroversion is expressed by the ratio (exports)/(gross output). During the pre-crisis period, exports represented about 40%-43% of the gross output with a simultaneous increase or stability in industrial production (Diagram 5). However, during the years of crisis, when the industrial production index has continuously decreased at an average annual rate of -6.3%, exports increased and the extroversion index (exports/production) increased from 43.6% in 2007 to 62.6% in 2013.

At the same time, Greek manufacturing, in an effort to increase its export performance, reduced its presence in the domestic market. The main reason was the low prices that prevailed in the Greek market due to the crisis and reduced demand. In other words, manufacturing enterprises turned to foreign markets in which they offered their products at better prices and with better payment terms. Diagram 10 shows the composition of domestic apparent consumption (production+im-

ports-exports). If we subtract exports from production, domestic production covers only 26% of domestic consumption, while the remaining 74% is satisfied by imports. It is worth noting that up to 2008 imports represented 70% or less of domestic consumption and consecutively increased to 74% in 2013.

In other words, the domestically produced goods were replaced by cheaper imported products and this is apparent from the terms of trade (exports price index/imports price index). The terms of trade improved in the period 2009-2015 by +28.2%, which means that during this period the prices the export enterprises achieved abroad were higher by 28.2% compared to the prices they would have achieved in Greece (this happened to a large extent in the food & beverage sector, [5]).

5. Conclusions

Over the last 20 years Greek manufacturing has been characterized by stagnation and, subsequently, a drastic decrease. In particular, during the pre-crisis period, 1995-2007, the average annual growth rate of the industrial production index was only +0.6%, and from 2008, the year that the first recession occurred, up to 2013, the average annual growth rate of the industrial production index was -6.3%. Thus, cumulatively over the period 2008-2013, industrial production shrank by -30.3%, and increased only in 2014 and 2015 by +1.8% and +1.9%, respectively. It follows from the above that in the period 1995-2015, industrial production fell by -19.5%. The result of the manufacturing sector's shrinkage is a drastic decrease in investments, the number of manufacturing enterprises and the number of employees. Investments, after a dramatic increase in the period 1995-2000, followed a downtrend until 2005 and, after a recovery in 2006, 2007 and 2008 (due to investments in the sectors of Oil & Coal and Chemical & Pharmaceutical Products), continued their downtrend, leading investments in 2013 to stand at 1995 levels. At the same time, the number of manufacturing enterprises fell from 5,814 in 1995 to 2,845 in 2013 and 82,090 jobs were lost (1995: 250,437 employees, 2013: 168,347 employees).

The gross output of manufacturing also shows a downtrend. After a continuous increase over the period 1995-2008, with an average annual growth rate of +6,9% and the output amounting to € 46 billion in 2008, it fell to € 42.3 billion in 2013, i.e. a cumulative decrease of -8.1%. The value added of manufacturing output also significantly decreased. During the period 1995-2004, the value added was about 36%-40% of the gross output. After 2005, this percentage constantly decreased, falling to 22% and 23% in the years 2012 and 2013, respectively, resulting in the decrease of manufacturing participation in GDP. During the period 1995-2001, the percentage of GDP coming from the manufacturing sector was above 7%. Since 2002, the participation percentage constantly decreased, reaching 4.9% and 5.4% in the years 2012 and 2013, respectively.

The main cause of the manufacturing sector shrinkage is the erosion of competitiveness based on the unit labour cost index. The Unit Labour Cost Index (ULCI) increased cumulatively in the period 1995-2011 by 86%, with an average annual growth rate of +3.9%, when the respective ULC index in the EU countries increased at an average annual rate of 1.9%. This resulted in Greek products cumulatively becoming 43% more expensive, in relative terms, than the products of our competitors. The decrease in wages and salaries imposed by the creditors with the adjustment programmes led to a decrease of ULC and an improvement of the Relative ULCI in the years 2011-2013, offsetting about 50% of the loss of competitiveness of Greek products. The main reasons for the increase in unit labour costs are the significant increase of wages and salaries and the disproportionately small, in relation to the first, increase in the production volume in manufacturing. In other words, the increase in unit labour cost is the result of two opposing varying sizes: labour compensation and its productivity. Suffice it to say that in the period 1995-2010 the average annual labour costs increased by +117% and productivity only by +9%. A convergence between the two indices is observed in the period 2010-2013, when the average annual labour costs decreased by -10% and productivity increased by +6%.

Exports are the only solution for the survival of manufacturing enterprises and in particular for the time when our country is plagued by the economic crisis and internal consumption is constantly shrinking. After continuous growth in exports during the period 1995-2008 with an average annual growth rate of +6.4%, a decrease by -17.5% follows in 2009 due to the international crisis. Since then, exports have been changing to a positive rate, recording a cumulative increase of +57.2% in the period 2009-2013. The significant improvement in the manufacturing sector extroversion is revealed by the increase of the exports/gross output index. During the pre-crisis period, exports represented about 40%-43% of the gross output (with industrial production approximately unchanged). However, during the years of

crisis, when the industrial production index continuously decreases, exports increased and the extroversion index (exports/production) increased from 43.6% in 2007 to 62.6% in 2013. In other words, the survival of the manufacturing sector depends almost exclusively on exports.

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Participation and possibilities of Greece in global value chains

Theodore Tsekeris*
Georgia Skintzi*

1. Introduction

Outsourcing has played a significant role in shaping the current global value chains (GVCs). Since the late 70s and during the 80s, companies have been moving away from consumers to industrial districts in order to benefit from scale economies and form new flexible cooperative networks (local outsourcing) and local value chains (Capasso et al., 2013). In the 90s, value chains began systematically and extensively to cross the borders, as companies operating in high-cost economies (mainly due to high salaries) relocated their production or/and other activities to low-cost countries. The technological revolution of the new millennium, through the rapid advancements in information and communication technologies and the significant improvements in transportation, enabled companies to spread their operations around the world, transforming value chains to GVCs (Capasso et al., 2013; Baldwin and Venables, 2013).

Offshoring[1] as a business practice goes at least 50 years back in western economies (Baldwin and Venables, 2013). During the last two decades, offshoring has expanded and evolved compared to previous years, as it not only refers to manufacturing but also to services and high value-added, knowledge-intensive activities (Ceci and Masciarelli, 2010; Lewin et al., 2009). Externalizing activities to other countries is the new and successful business model (Lewin and Volberda, 2011; Schmeisser, 2013). Moreover, offshoring seems to affect the world economy in terms of competition, employment, innovation processes and countries' comparative advantages (Ceci and Masciarelli, 2010).

In this article, we present an updated review of the aforementioned trends and practices, emphasizing the participation of Greece in GVCs. More specifically, in the next section, a country's and a company's competences and desirable characteristics in order to participate in GVCs are described. In the third and fourth sections, the total participation and the sectoral participation, respectively, of Greece in GVCs are analyzed. The last section summarizes and presents conclusions and some policy implications.

2. Firm and country determinants of participation in global value chains

There are many factors that drive the decision of companies to offshore: cost reduction, access to qualified/skilled personnel, access to specialized technologies, increased efficiency and flexibility, access to new markets, imitating a common practice and pressure from competition (Lewin and Peeters, 2006; Ceci and Masciarelli, 2010). The relocated activities may include manufacturing, information technology, and research and development –for example, the design of new products, business processes, accounting and financial services (Roza et al., 2011; Lewin et al., 2009).

A company may take into account a variety of factors to decide whether to outsource or not and where to locate the outsourced activities. The desirable competences the host country (Box 1) and the host company (Box 2) should have are presented and analyzed in the international literature. These characteristics play a greater or lesser role in a company's decision to cooperate with a foreign company, depending on the specific characteristics of the outsourced activity (Jensen and Pedersen, 2011). For example, for manufacturing simple products, cost is more important, while for producing high-technology products, emphasis is given to quality and the expertise of the personnel. Infrastructure that facilitates international trade and transport play an important role when manufacturing activities are relocated to a foreign country. As far as services are concerned, emphasis is given to education and language, and, in the case of outsourcing R&D activities and other high value-added activities, emphasis is given to the competences of the workforce (large pool of qualified and talented personnel) and to national support for innovation and knowledge creation.

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1. The term offshoring refers to the externalization of a company's certain activities beyond national borders. The internationalization of these activities concerns the company's input-market side and not the output-market side of the value chain, i.e., it refers to sourcing rather than sales activities. In existing literature there is often confusion between the terms offshoring and outsourcing. With the term outsourcing we refer to unaffiliated companies, while with the term offshoring the companies could be either affiliated or unaffiliated, but they are located in different countries (Schmeisser, 2013). The term internal offshoring (or captive offshoring or international insourcing) refers to offshoring an activity to a company's own affiliates. Respectively, the term offshore outsourcing (or outsource offshoring or international subcontracting) refers to offshoring to unaffiliated companies (Manning et al., 2008; Kenney et al., 2009).

BOX 1

Desirable competences of host country/economy

- High degree of cultural compatibility between the home and host country (Bunyaratavej et al., 2007; Kshetri, 2007).
- Low political risk level, as political stability reduces uncertainty and therefore transaction costs are also reduced (Bunyaratavej et al., 2007; Doh et al., 2009; Kediaa and Mukherjeeb, 2009; Demirbag and Glaister, 2010).
- High level of education (Bunyaratavej et al., 2007; Doh et al., 2009).
- Large pool of qualified and talented work force (Lewin et al., 2009; Ceci and Masciarelli, 2010; Demirbag and Glaister, 2010; Roza et al., 2011).
- Developed knowledge infrastructure and national innovation system, which incorporate universities and research centers, as well as national policies that encourage knowledge and innovation creation and spillovers (Demirbag and Glaister, 2010).
- Strong rule of law, especially with respect to the protection of personal data (Kshetri, 2007) and intellectual property rights (Ceci and Masciarelli, 2010).
- Similar technological profile and larger knowledge stock (Chung and Yeaple, 2008).
- Presence of infrastructure that facilitates international trade (efficient customs offices, transport infrastructure, favorable regulatory environment), especially when manufacturing activities are outsourced (Nordås, 2006; Bunyaratavej et al., 2007; Murphy and Siedschlag, 2015).
- Presence of professional and trade associations that enforce a code of ethics to their members (Kshetri, 2007).

BOX 2

Desirable competences of host company

- Adopting a culture of modern management (Kshetri, 2007).
- Highly qualified and skilled personnel (Lewin et al., 2009; Ceci and Masciarelli, 2010; Roza et al., 2011).
- Lower labor cost compared to the home country (Doh et al., 2009; Kediaa and Mukherjeeb, 2009; Demirbag and Glaister, 2010); it should be noted that labor cost is expected to increase in case of successful cooperation, especially if high value-added activities are relocated (Bunyaratavej et al., 2007).
- High use of the home-country language from the foreign firm personnel (Doh et al., 2009).

Greece is endowed with certain desirable characteristics that are proposed in the literature, e.g. high degree of cultural compatibility (with western economies that are the common home countries) and strong rule of law, especially as far as the protection of personal data and intellectual property rights are concerned. There is also a continuous effort to develop further the infrastructures that facilitate international trade in terms of services (customs, etc.) as well as transportation (ports, road networks, etc.). On the other hand, the economic environment is particularly unstable, since the country is facing a long economic crisis, which may deter foreign companies from investing.

The assessment of the level of education in Greece, the knowledge infrastructure and the national innovation system and the comparison with other countries is extremely complex and goes beyond the objectives of this article. Indicatively, based on OECD data,[2] Greece is ranked 32nd among the 37 countries examined in relation to the direct government funding of business R&D and tax incentives for R&D (in 2013). Moreover, Greece is ranked last, among 37 countries, as far as R&D expenditure by business enterprises is concerned, i.e., 33.3% of gross domestic expenditure, while the corresponding percentage for 27 countries exceeds 50% (OECD, 2015a).

2. <https://www.oecd.org/sti/rd-tax-incentive-indicators.htm>.

As far as the educational level in Greece is concerned, it is notable that significantly high percentages of participation in tertiary education are observed. According to the OECD (2016), 47% of the population at the age of 18 participated in tertiary education in 2014, the second highest percentage after South Korea among 33 OECD member countries (the OECD average is 18%). The corresponding percentage at the age of 19 is 54% (the OECD average is 33%), the third highest after South Korea and Ireland, while at the age of 20, it is 55% (the OECD average is 39%), the fourth highest after South Korea, Ireland and Slovenia. In addition, Greece is ranked 6th among 40 countries in the tertiary education graduates in natural sciences and engineering, with a percentage of 26% among all tertiary graduates (OECD, 2015a). Nevertheless, it should be noted that Greece has 5.8 doctorate holders per 1,000 population aged 25-64 and it comes 21st among 34 countries in the relevant ranking (OECD, 2015a).[3]

The OECD (2015a) provides an overview of the presence of talented and skilled workforce in several countries. In Greece, in 2013, there were 7.49 researchers[4] per 1000 employed (21st among 36 countries) and 10.84 R&D personnel (researchers and technicians and support staff) per 1000 employed (24th among 34 countries). Only 13.9% of researchers are employed in business (the lowest percentage among 36 countries), while in 30 out of 36 countries under examination the corresponding percentage is above 30%. Researchers are mainly employed in education (65.2%) and in the government (19.9%).

From the above presentation of certain aspects of the desirable characteristics, it becomes apparent that further study is needed to assess the competences of Greece and to identify those characteristics that should be strengthened in order to promote its position in GVCs.

3. The total participation of Greece in global value chains

The participation index of a country in global value chains is strongly associated with the position and role of that country in international trade and global production and supply chain networks. Consequently, it denotes the potential of that country to get involved in offshoring activities, namely, to participate in interconnected activities of the production and processing of intermediate goods on behalf of foreign firms. According to the OECD's methodology (OECD, 2013a; OECD, 2015b) concerning the analysis of intersectoral inter-country input-output tables, the participation of a country in GVCs is defined in relation to its forward and backward linkages with other countries. Specifically, the forward linkages refer to the (intermediate) inputs produced in a country and embodied in the gross exports of another country to third countries. The backward linkages refer to the foreign (intermediate) inputs which are embodied in the gross exports of the country. The total of forward and backward linkages constitutes the overall participation of the country in GVCs.

The forward and backward linkages of country *c* are obtained from calculating the following vectors, respectively:

$$EXGR\_DVA_{c,p} = (\mathbf{V}\,\mathbf{B}\,\mathbf{EX})_{c,p}\,, \qquad (1)$$

$$EXGR\_FVA_{c} = \mathbf{V}\,\mathbf{B}_{c}\,EXGR_{c,i}\,. \qquad (2)$$

The vector $EXGR\_DVA_{c,p}$ corresponds to the value added (in monetary terms) which is produced in country *c* and is embodied in the gross exports of country *p* (to third countries), while the vector $EXGR\_FVA_{c}$ corresponds to the foreign value added (including the value of intermediate goods and services imported from other countries) which is embodied in the gross exports of country *c*. The vector **V** corresponds to the ratio of value added to the total production in country *c*, the matrix $\mathbf{B} = (\mathbf{I} - \mathbf{A})^{-1}$ is the global inverse Leontief matrix, where **A** is the matrix of technical coefficients[5] of the intersectoral inter-country input-output matrix, and $\mathbf{B}_{c} = (\mathbf{I} - \mathbf{A}_{c})^{-1}$ is the local inverse Leontief matrix, whose elements refer to country *c*. The matrix **EX** corresponds to the global matrix of gross exports, and the matrix elements $EXGR_{c,i}$ indicate the total gross exports of goods/services belonging to sector *i* of country *c* to the rest of the countries.

Based on the calculated amount of forward linkages, as described in equation (1), the value added $EXGR\_DVA_{c,i}$ which is produced in sector *i* of country *c* and is embodied in foreign exports to third countries, as a share of the gross exports in the specific sector *i*, is given as follows:

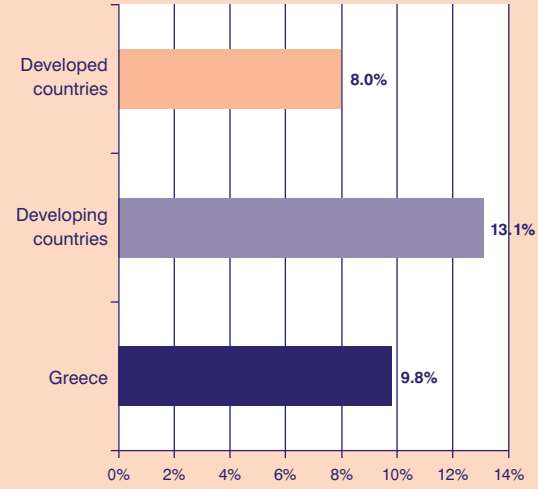
$$EXGR\_DVA_{c,i} = \frac{\sum_{p} EXGR\_DVA_{c,p,i}}{EXGR_{c,i}} \times 100\,, \qquad (3)$$

3. The data for Greece refer to the year 2013 and to doctoral graduates from 1990 onwards.

4. Researchers are defined as professionals engaged in the conception and creation of new knowledge, products, processes, methods and systems and are directly involved in the management of projects.

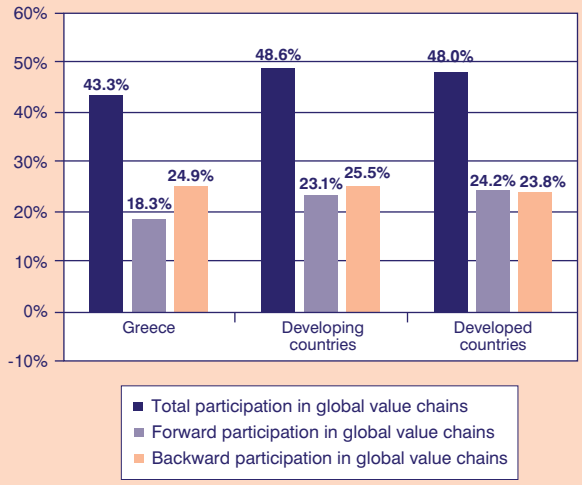
5. The matrix of technical coefficients is defined as the ratio of each entry of matrix **A** to the corresponding column sum.

FIGURE 1
Average percentage change of the participation of Greece and other countries in global value chains (% share in total gross exports), 1995-2011



Source: Trade in Value Added and Global Value Chains, OECD.

FIGURE 2
Indices of the participation of Greece and other countries in global value chains (% share in total gross exports), 2011



Source: Trade in Value Added and Global Value Chains, OECD.

where $EXGR\_DVA_{c,p,i}$ is the value added which is produced in country *c* and is embodied in sector *i*, whose goods/services are exported from country *p* to third countries, as obtained from the element *i* of vector $EXGR\_DVA_{c,p}$ in equation (1). This index depicts the sectoral export penetration of country *c* in global value chains. Correspondingly, on the basis of the calculated amount of backward linkages, as described in equation (2), the value added $EXGR\_FVA_{c,i}$ which is produced in other countries in sector *i* and is embodied in the exported value added of production in country *c*, as a share of the gross exports in the specific sector *i*, is given as follows:

$$EXGR\_FVA_{c,i} = \frac{\sum_p EXGR\_FVA_{c,p,i}}{EXGR_{c,i}} \times 100, \qquad (4)$$

Where $EXGR\_FVA_{c,p,i}$ is the foreign value added which is embodied in sector *i* of country *c*, whose goods/services are exported to country *p*. This index depicts the degree of participation of a country in backward linkages in global value chains and, consequently, the extent of dependence of its gross exports from importing intermediate goods and services.

Figure 1 illustrates that during the period 1995-2011, for which intersectoral inter-country input-output tables are available from the OECD, Greece raised its participation in GVCs by 9.8%. This increase is greater than the corresponding increase of the GVC participation of developed countries (by 8%), but smaller than the corresponding increase of the GVC participation of developing countries (by 13.1%).

Figure 2 shows the indices of the participation of Greece and of the developed and developing countries in GVCs in 2011. Greece's index (43.3%) of total participation lagged behind the average total participation indices of both developing and developed countries (48.6% and 48%, respectively). In Greece, there were more backward linkages (24.9%) than forward linkages (18.3%). This imbalance of the linkages of Greece in GVCs was intensified compared to 2009, where the forward linkages amounted to 19%, while the backward linkages amounted to 23% (OECD, 2013b). In contrast with Greece and the total of the developing countries, where backward linkages also overwhelmed forward linkages, the total of the developed countries showed a surplus of forward linkages against backward linkages in the GVCs.

Table 1 concentrates on the comparative analysis of the participation indexes, in terms of the total export penetration in GVCs, as defined in equation (3) (for all sectors), of Greece and other selected countries worldwide. The total value added, which was produced in Greece and then penetrated in GVCs, increased from 11.9% in 1995 to 18.3% in 2011. Although Greece's GVC participation ranking improved from position 55 in 1995 to position 44 in 2011, it remained at a lower level than the world average share, which increased from 16% in 1995 to 22.8% in 2011. The largest increase in the GVC participation ranking was observed in de-

TABLE 1 Domestic value added of Greece and other selected countries, which is embodied in foreign exports to third countries, as a share of total exports, 1995-2011

	1995		2011	
Country	**Share (%)**	**Rank**	**Share (%)**	**Rank**
Greece	**11.9**	***55***	**18.3**	***44***
Bulgaria	14.7	*37*	16.7	*50*
Cyprus	11.0	*59*	17.1	*48*
Italy	15.4	*33*	21.1	*33*
Germany	20.7	*7*	24.1	*23*
Netherlands	17.9	*21*	27.5	*11*
France	17.9	*19*	21.9	*32*
United Kingdom	19.0	*12*	24.7	*18*
Russia	25.1	*3*	38.1	*4*
Turkey	13.3	*45*	15.3	*58*
United States	19.4	*11*	24.9	*16*
China	9.5	*61*	15.6	*56*
Japan	23.8	*4*	32.8	*6*
Saudi Arabia	26.9	*1*	42.0	*2*
Brunei Darussalam	21.0	*5*	42.7	*1*
Rest of the World	18.4	*16*	33.2	*5*
World Average share	**16.0**		**22.8**	

Source: <https://stats.oecd.org> and own processing.

veloping countries (including the rest of the world), particularly in Brunei Darussalam, which reached the first position in the 2011 with a share amounting to 42.7%, compared to 21% in 1995, surpassing Saudi Arabia, which fell to the second position with a share of 42%, compared to 26.9% in 1995. These shares can be largely attributed to the significant production of oil in the aforementioned countries.

4. The sectoral participation of Greece in global value chains

Table 2 shows that, in 2011, Greece's most significant export sector, by far, (with the most forward linkages) in global value chains was that of transport and storage, while the sector of wholesale and retail trade and the sector of electricity, gas and water follow in order. This outcome reveals the crucial role of transport, particularly of maritime freight transport and, to a lesser extent, of air passenger transport, in the surplus of the services balance in Greece (Tsekeris, 2016). Furthermore, it verifies the results of previous analyses (OECD, 2013a), according to which Greece, together with Luxemburg and Ireland, are the countries with

TABLE 2 Participation of Greece in global value chains in terms of the forward linkages (% total foreign exports of domestic inputs to third countries), 2011

Top exporting sectors to global value chains	
Transport and storage	33.40%
Wholesale and retail trade	14.30%
Electricity, gas and water	5.90%
Top exporters of Greece's inputs through global value chains	
Germany	12.10%
Italy	8.30%
United Kingdom	6.80%

Source: Measuring Trade in Value Added: An OECD-WTO joint initiative (URL: <http://www.oecd.org/sti/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm>).

TABLE 3 Participation of Greece in global value chains in terms of the backward linkages (% share in total foreign content of exports), 2011

Top importing sectors in global value chains	
Transport and storage	32.20%
Petroleum products	23.50%
Basic metals	10.10%
Top foreign input provider countries in global value chains	
Russian Federation	20.50%
United States of America	7.20%
Saudi Arabia	6.70%

Source: Measuring Trade in Value Added: An OECD-WTO joint initiative (URL: <http://www.oecd.org/sti/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm>).

the largest share of value added in services exports among all OECD member countries.

Table 2 also demonstrates that, in 2011, the most important countries exporting (intermediate) inputs produced in Greece were large EU member countries, such as Germany, Italy and the United Kingdom. Table 3 indicates that, in 2011, Greece's most significant value added import sector (with the most backward linkages) in global value chains was that of transport and storage, with the sectors of petroleum products and basic metals to follow in order. Regarding the main countries exporting (intermediate) inputs to Greece, whose value added is embodied in the Greek gross exports, Russia comes first with a significant difference from the second and third countries, i.e., the United States and Saudi Arabia. Among others, these findings suggest the considerable dependence of the Greek export activity on countries having a critical role in the production and distribution of energy, such as Russia and Saudi Arabia (through the import of natural gas and crude oil, respectively).

On the basis of equation (3) for calculating the forward linkages of a country in a specific sector, Table 4 shows that Greece only slightly improved its posi-

TABLE 4 Domestic value added of Greece and other selected countries, which is embodied in foreign exports to third countries, as a share of exports in the manufacturing industry, 1995-2011

	1995		2011	
Country	**Share (%)**	**Rank**	**Share (%)**	**Rank**
Greece	**8.7**	***56***	**11.9**	***55***
Bulgaria	11.0	*38*	13.2	*46*
Cyprus	6.5	*61*	9.3	*60*
Italy	12.3	*30*	16.6	*30*
Germany	16.7	*5*	18.7	*18*
Netherlands	13.4	*26*	17.5	*24*
France	14.1	*20*	16.8	*28*
United Kingdom	14.8	*13*	16.8	*29*
Russia	20.1	*3*	29.3	*4*
Turkey	10.1	*45*	12.1	*54*
United States	15.6	*10*	18.3	*21*
China	7.4	*60*	12.4	*52*
Japan	20.2	*2*	28.4	*5*
Saudi Arabia	20.4	*1*	33.7	*1*
Brunei Darussalam	15.4	*11*	31.8	*2*
Rest of the World	14.2	*19*	26.5	*7*
World Average share	**12.4**		**17.3**	

Source: <https://stats.oecd.org> and own processing.

tion (from 56 to 55) in the GVC participation ranking during 1995-2011, in terms of its forward linkages in the broad sector of manufacturing, despite its relevant share increase from 8.7% to 11.9%. The export penetration of Greek manufacturing products in GVCs significantly lags behind the world average share, which increased from 12.4% in 1995 to 17.3% in 2011.

To the contrary, Table 5 shows that Greece significantly improved the corresponding index of forward linkages in business services (5.3% in 2011 from 2.6% in 1995), reaching the 17th position in 2011 from the 34th position in 1995, and exceeding the world average share (4.1% in 2011). Therefore, the broad sector of business services in Greece presents considerably higher growth potential and increasing opportunities for participation in GVCs, in comparison to the manufacturing industry.

Next, the countries in which Greece has achieved the best export performance in GVCs are identified, in terms of the domestic value added content of gross exports at the level of economic activity sector *i*. For this purpose, the corresponding share $EXGR\_DVApSH_{c,p,i}$ per country-partner *p* which imports goods and services from Greece (here denoted with the sub-index *c*) is calculated, as follows:

$$EXGR\_DVApSH_{c,p,i} = \frac{EXGR\_DVA_{c,p,i}}{\sum_p EXGR\_DVA_{c,p,i}} \times 100 . \quad (5)$$

According to the results of Table 6, in 2011, the most important destination of intermediate manufacturing products from Greece, in terms of their content in domestic value added, was Cyprus, with a share equal to 20.7%. The countries which follow with considerably smaller share values are Bulgaria (4.8%), Russia (1.5%), Turkey (1.2%) and Malta (0.9%). Correspondingly, Table 7 indicates that, in 2011, the top country receiving intermediate business services from Greece with the largest domestic value added content was also Cyprus, with a share equal to 8.6%. Bulgaria (3.4%), Russia (2.2%), Italy (1%) and Romania (0.8%) follow in order. These findings suggest the intense regional dimension of GVCs and the fact that geographical proximity and transport costs play a crucial role in the integration of value chains and the creation of shared production clusters.

TABLE 5 Domestic value added of Greece and other selected countries, which is embodied in foreign exports to third countries, as a share of exports in business services, 1995-2011

	1995		2011	
Country	**Share (%)**	**Rank**	**Share (%)**	**Rank**
Greece	**2.6**	***34***	**5.3**	***17***
Bulgaria	2.6	*35*	2.5	*52*
Cyprus	3.8	*6*	6.1	*7*
Italy	2.4	*40*	3.5	*40*
Germany	3.1	*17*	4.2	*26*
Netherlands	3.6	*7.0*	8.6	*1*
France	3.1	*16*	4.0	*31*
United Kingdom	3.3	*12*	6.4	*4*
Russia	3.6	*8*	5.8	*12*
Turkey	2.5	*39*	2.2	*59*
United States	2.8	*31*	5.1	*19*
China	1.8	*59*	2.4	*55*
Japan	2.9	*25*	3.4	*42*
Saudi Arabia	4.9	*2*	6.0	*10*
Brunei Darussalam	5.0	*1*	5.2	*18*
Rest of the World	3.1	*19*	4.7	*20*
World Average share	**2.8**		**4.1**	

Source: <https://stats.oecd.org> and own processing.

TABLE 6 Main destination countries of Greek intermediate product exports in the manufacturing industry with respect to the domestic value added content, 1995-2011

1995		2011	
Country	**Share (%)**	**Country**	**Share (%)**
Bulgaria	10.26	Cyprus	20.68
Cyprus	7.73	Bulgaria	4.81
Italy	2.63	Russia	1.47
Romania	2.44	Turkey	1.23
Turkey	1.42	Malta	0.94

Source: <https://stats.oecd.org> and own processing.

TABLE 7 Main destination countries of Greek intermediate product exports in business services with respect to the domestic value added content, 1995-2011

1995		2011	
Country	**Share (%)**	**Country**	**Share (%)**
Cyprus	6.89	Cyprus	8.63
Bulgaria	2.76	Bulgaria	3.43
Italy	1.96	Russia	2.15
Romania	1.26	Italy	0.96
Russia	1.03	Romania	0.75

Source: <https://stats.oecd.org> and own processing.

5. Conclusions

Offshoring has a history of at least 50 years. During the last two decades, it has been transformed and has evolved significantly, as it not only concerns manufacturing but also services and high value-added and knowledge-intensive activities. Offshoring is shaping the world economy, as it affects competition, employment, processes of creating innovation and knowledge, and even countries' comparative advantages.

Companies take into account a plethora of factors in order to decide whether and where to offshore certain activities. They desire the sourcing country and company to have specific competences. At the country level, the main competences concern human capital, the institutional and legal framework, the country's risk profile, labor cost, transportation, information and communication infrastructure, and knowledge and innovation infrastructure. At the company level, the desirable characteristics concern human capital, communication skills and management. Further research is needed in order to identify the specific competences that could enhance the competitiveness of Greece and promote its participation in GVCs.

Based on the results of the analysis of the OECD's inter-country input-output database for 2011, Greece lags behind the developing countries as well as the developed countries in the total participation (backward and forward linkages) in GVCs. Nevertheless, Greece's participation in GVCs increased during the period 1995-2011 at a faster rate than the other developed countries. The lag between the backward and forward linkages of Greece in GVCs also increased in favor of the former. This fact denotes the limited competitiveness of the country in exporting intermediate goods and services with significant domestic value added content. Additionally, it possibly suggests the increased offshoring activity of foreign firms in Greece and the considerable reliance of the Greek exports on importing intermediate goods and services.

The goods/services with high foreign value added content, which are exported from Greece, mainly concern transport and storage services, petroleum products and basic metals, and they are not so much related to innovation and knowledge intensive activities. Similarly, the foreign exports of high domestic value added products mostly refer to transport and storage services and, to a lesser extent, wholesale and retail trade services, and electricity, gas and water. These foreign exports largely originate from other EU countries (particularly Germany). Although the forward linkages of Greece with other countries in GVCs mostly involve manufacturing products, the corresponding participation of the country through business services was found to exhibit a significantly higher growth rate during 1995-2011.

The intermediate high domestic value added products are mostly exported to countries which are geographically close to Greece. This outcome signifies the importance of policies aimed at reducing transport costs in order to regionally integrate value chains and create shared production clusters. The position of Greece in regional value chains could also be enhanced through strengthening and upgrading innovation and knowledge infrastructure, in conjunction with information

and communication infrastructure, as these technologies tend to have a growing impact on every aspect of economic and social activity.

Greece could improve its participation in GVCs through the development of specialized activity clusters to produce internationally tradable goods with high domestic value added content (Tsekeris, 2017). The specialization of clusters should carefully take into account the comparative advantages of each region and all possible synergies that may be created across space and among sectors with increased potential in GVCs. The economies of agglomeration of outsourcing activities would be fostered by ensuring high accessibility of the industrial, technological and business logistics parks to international transport hubs. Finally, appropriate financing tools, allowances and incentives should be provided to attract both local and multinational enterprises in those clusters.

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The acquisition & management of the NPLs from investment funds and companies in Greece

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1. Introduction

One of the major problems faced by the Greek banking system is the acquisition and management of their non-performing loan (NPL) portfolios. More specifically, the high amount of the NPLs, which in September 2016[1] exceeded 107.5 billion euro, has raised serious concerns on whether the relationship of systemic banks' loan portfolios with their equity can comply with the requirements imposed by the Basel III (2011) regarding capital adequacy (see Panagopoulos and Peletidis, 2016). It also sets some serious questions on whether systemic banks can perform their role as financiers of potential economic growth by placing a very significant part of their resources (financial, human, technological, etc.) on a large amount of problematic assets.

In September 2016 the credit institutions reported to the supervisory authorities some concrete action (business) plans for the management of the non-performing exposures (NPEs) with a specific target to reduce them by 38% in the period from June 2016 to December 2019. Based on these business plans, the systemic banks intend to reduce NPLs/NPLEs with a combination of actions. These (actions) include loan re-profiling, deletions, banks' recoveries from liquidating collaterals and, finally, sales of NPLs/NPLEs to investment entities (funds) or companies that specialize in the so-called "distressed funds" operations.

By selling these problematic loans to the aforementioned investment entities or companies, the banking system attempts to get rid of a substantial amount of NPLs mainly by selling them at a discounted value in exchange for some cash liquidity from these investment entities. This way the systemic banks will seek to deleverage their loan portfolios and the investment funds/companies: a) will assist the systemic banks to pay back the important short-term obligations e.g. the ELA,[2] b) will provide cash liquidity which could be directed to finance some real economy projects and c) could potentially participate, through the acquisition of shares and/or convertible bonds, in the capital funding of these systemic banks. This last action could strengthen the systemic banks supervisory capital in order to become viable as a more long-term prospect.

In the next section of the article, we attempt a brief presentation of the characteristics that constitute the principles of investment entities' operation upon the acquisition and management of the NPLs in Greece. In section 3, we summarize the international activities of the distressed (hedged) funds as legal entities, in particular, that invest in NPLs. Additionally, we provide a short description of the most important investment funds or companies that operate internationally as well as those that intend to operate in Greece. In section 4, we present an example of the factors (parameters) which play an important role in the optimization of the NPL portfolios' returns for such entities. In addition, we conduct a sensitivity analysis, by "relaxing" the value for some of these factors, in order to reveal the margins of these NPL portfolios' returns. Finally, in section 5, we offer some conclusions and policy proposals.

2. The legal framework on the operation of companies acquiring or managing bank loans claims in Greece

Greek Law no. 4389/2016, as in force after successive amendments within a short period of time, regulates the establishment and operation of special purpose companies, as entities being engaged in either the acquisition of claims arising from bank loans or the management of such claims. Consequently, in our country, a company cannot acquire claims arising from bank loans and at the same time manage these claims. This apportionment of business activities to separate entities is far from creating conditions of economies of scale. The acquisition of

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1. See the *Overview of the Greek Financial System* (2017), Bank of Greece.

2. ELA: Emergency Liquidity Assistance.

claims arising from bank loans is allowed, though, only with the condition that the acquiring company has signed an agreement concerning the management of these claims, with another company, which is entitled to manage claims arising from bank loans. In other words, the combination of these two activities, acquisition and management, is achieved through the contractual relationship between the entities being engaged in the respective activities. On the other hand, the company which manages such claims can refinance them, possibly by implementing a restructuring plan of the borrowing enterprise.[3]

A careful study of the provisions of the Law, however, reveals that the Greek legislature has failed to regulate the Greek companies engaged in the field of claims arising from bank loans as investment funds that have a specific investment policy. The funding of these companies will be achieved, primarily, not from the public, but from specific funders. And if the latter are connected to a certain bank, it is doubtful whether a diversification of the bank loans claims portfolio under management can be achieved, while the real independence of the bank from these claims is doubtful, too. Even more, the portfolio under management will not include claims arising from other loans (except from bank loans) or claims against over indebted or problematic enterprises arising from another cause –a fact that excludes the further allocation of risks for the managing or acquiring company, as well as the search for returns from the acquisition and management of other claims. Greece has not taken into consideration the example of Korea for the confrontation of the claims arising from non-performing bank loans, when, during the period 1997-1998, the Korea Asset Management Corporation (KAMCO) became able to acquire claims also from financial institutions other than banks, having thus a more general role in the procedure of financial sector restructuring and of market development (see Dong He, 2004). Furthermore, the exclusivity of the purpose of bank loans claims management companies, as outlined by the Law, deprives them from the opportunity to act as consultants of enterprises, using their expertise in this field, unless they undertake the refinancing of the claims they manage. By this meaning, the expansion of the activity of these companies is permitted only with the condition of the simultaneous assumption of business risk, through the refinancing and the restructuring of the borrowing company. Under these circumstances, the fields, within which the financing for the establishment of such companies will be sought, as well as the context of their activity, are limited.

The management of the non-performing claims of banks can also be attempted through the securitization route, but it is up to the companies who will acquire or manage these claims to adopt an investment policy that, with the categorization of the claims under securitization, on the basis of criteria that will each time be selected,[4] would form an acceptable risk profile, with the view that the systemic risk would be reduced. We must point out herein that the aforementioned risk should be considered as increased, since the legal regime permits the concentration of claims arising from loans of a certain bank into a single portfolio. These conditions also impact the formation of prices at which the claims will be acquired by the acquisition and/or management companies, as well as the claims' subsequent acquisition value, thus affecting the prospects for achieving the best possible performance.

The companies acquiring or managing bank loans claims, as regulated by Law no. 4389/2016, are placed outside the scope of the legislation in force on the alternative investment fund managers (Mouzoulas, 2016). This result, in addition to issues of the compatibility of our country's legislation with the European Union legislation and, in particular, with Directive no. 2011/61/EC, places the Greek legal provisions on a different level than that on which the respective legal provisions of foreign countries are placed.[5] The latter illustrate more clearly, with respect to the companies being engaged in this field, the characteristics of asset managers and of investment funds. It is a fact that the management of claims arising from bank loans, in conjunction with their acquisition, constitutes an investment activity which entities raising funds from the public undertake to exercise. In this way, the concentration of funds that are subsequently invested through a collective management, for the benefit of investors, is better achieved. The approach of the Greek Law, in this context, is revealed as incompatible with inter-

3. In particular, the refinancing of claims, as an activity, as provided by Law no. 4389/2016, can be linked to the "restructuring of the borrowing enterprise, under a specific restructuring plan". Consequently, the refinancing of claims arising from bank loans, in a case like this, shall constitute a part of this plan.

4. Indicatively, such criteria may include the degree of collateral and/or the nature of the loan as business, mortgage or other, etc.

5. However, elements that are similar to the situation in Greece, in relation to the non-performing bank loans, can be found in other European countries, too, especially in Italy (see at Jassaud & Kang, 2015).

national practice, which is increasingly expanding and intensifying, providing investment opportunities and high yield potentials.

Another feature of Law no. 4389/2016 is the fact that only the companies managing claims are directly subject to a prudential regime and, in order to be engaged in this field, they obtain special permission from the Bank of Greece. Additional permission, from the same authority, is also required in order for the management company to be engaged in the field of refinancing claims. On the contrary, companies acquiring bank loans claims do not obtain permission for operation from the Bank of Greece. However, the activity of these companies is integrally linked to the company which manages such claims and has already obtained the relevant permission. Consequently, practically, it is up to the latter to ensure the lawfulness of the acquisition of the claim, checking, in this way, the activity of the company which it contracts for the management of the claim. In this perspective, Law no. 4389/2016 transposes the supervision of the operation of the companies acquiring claims to an entity supervised by the Bank of Greece (Mouzoulas, 2016).

Nevertheless, Law no. 4389/2016 provides that companies of another EU member-state can undertake the management of claims arising from bank loans, with the prerequisite that they are legally established in Greece through the form of a branch. The Law does not require, however, that these companies are operating as companies with a special purpose. Likewise, the acquisition of claims arising from bank loans by foreign companies is also permitted, if certain conditions are met. But since these companies are established in another EU member-state, it is not necessary that they have a branch in Greece. However, it is interpretatively concluded that if a company originates from a third country, it has to be established in Greece in order to be able to acquire claims from bank loans. The absence of any further specification, in the Greek legislation, of the foreign companies that are entitled to manage claims arising from bank loans, leaves open the possibility that they are operating as investment funds, being engaged in the field of claims arising from loans, under a principal or secondary purpose. An investment fund, though, that operates under the legal form of a mutual fund or trust, does not seem to be able to be engaged in the field of acquisition and management of claims arising from bank loans. This conclusion follows from the wording of the relevant legal provisions. But apart from this, it has to be underlined that the Greek legislation seems to be more lenient with respect to the activity of foreign companies in the field of acquisition and management of bank loans, in relation to the Greek companies.

3. The international experience of entities that invest in bank loans

The so-called "distressed funds" (alternatively, investing entities) decisively appeared, on the international financial scene after the financial crisis of 1997-1998 in the South Korean economy. This crisis was accompanied by a banking collapse in the country, due to the large number of NPLs/NPEs (see Dong He, 2004). Similar problems currently exist in the Italian banking system, as reported by Kang and Jassaud (2015). In the Italian case, the creation of special asset management companies (AMCs) is recommended by the authors as vehicles that could effectively help in the sanitation of the banking system through the sale and restructuring of the NPLs.

The most important entities in the industry

In the international financial market, the so-called "distressed funds" do not engage in a unique activity. In other words, their turnover is not produced by only one activity, like the NPLs, but also incorporates other activities such as, for example, compensation strategies (hedging), buying and selling international stock indices (trading), investing in fixed income securities, buying and selling property (real estate), etc.

At the international level, some large investment entities/companies that specialize in such financial activities are: Icon Capital, Calamos Asset Management, York Capital Management, Elliott Associates, FG Hemisphere, Leon Black, Apollo Global Management, Baupost, Centerbridge, Marathon Asset Management, Oaktree Capital, Carlyle, Strategic Value Partners, Cerbetus, etc.[6]

Activation in Greece

Meanwhile, the establishment of some of those investment entities (funds) in the Greek financial market of

6. Indicatively, we could mention here that Oaktree Capital (fund) has assets under management of more than $97 billion; Apollo Global Management has assets under management of more than $188 billion. There are, of course, smaller funds like Marathon Asset Management, with assets under management of more than $13 billion, and Calamos Asset Management, with assets under management of more than $19 billion, etc.

NPLs has been already announced. In particular, the first initiative belongs to Aktua Hellas, which is the co-operation of Alpha Bank and the Spanish Aktua Soluciones Financieres. Additionally, we can mention that in May 2016 Alpha Bank and Eurobank agreed with US investment fund KKR and the European Bank for Reconstruction and Development (EBRD) to create an asset management platform (investing entity) named "Manco". This entity will be managed by Pillarstone, a subsidiary of KKR.

The establishment of such investment entities (funds) in Greece could help in the potential growth of the economy. Actually, it is expected that these entities will mainly focus on large business loans sourced from some of the most dynamic and privileged sectors of the economy, e.g. tourism, aquaculture, energy, construction, etc. In other words, they will buy, for example, receivables from companies from these sectors and then, after a period of consolidation, try to resell them at a much higher value.

4. Some basic assumptions and the estimated return of a portfolio of entities that invest in bank loans

The purpose of this section is to make the "distressed funds" operating mechanism, which invests in NPLs, understandable. More specifically, we will present the process (method) which is implemented by those funds in order to optimize their returns (their internal rate of return, IRR). For this, we are going to rely, in principle, on some factors (parameters) which are assumed to affect the returns of those entities. These factors are recorded below in detail and summarized in Table 1. Then, by conducting a *sensitivity analysis*, we will try to investigate the variation of those entities' portfolio return (IRR). Actually, we will relax the initial values from some of the principal factors which, in our opinion, fundamentally affect the portfolio's performance.

The approaching method

We should initially underline here that the main factor (parameter) which largely determines the viability of any business investment (to the extent that it will potentially compensate investors for the risks they undertake) is that the estimated annual cash flows –appropriately discounted– are always compared to total capital initially invested. If the resulting difference is positive, then the investment is judged as profitable and, hence, is highly likely to be realized. Otherwise, the project is doomed either to be rejected or to wait for the appropriate conditions (e.g. technological, market, etc.) that will turn it again to a profitability. The method just described is internationally known as a *net present value (NPV) analysis* and is the most applicable. Alternatively, a decision-making process, regarding investments, is the *IRR*. This last method seeks the appropriate discount rate which will turn any time anticipated cash outflows-inputs process of the investment, equals to zero. In that case this discount rate is able to compensate at least the prospective investors for placing his/her funds in that investment (including the undertaking risks). Such investment is consequently classified as "efficient" and potentially "viable". In order to determine the potential IRR of our "pedagogic" investing entity's NPL portfolio, we will implement this second method.

The seven (7) underlying factors (parameters) that seem to affect the performance of our theoretical NPL portfolio are presented below. In detail:

Factor 1: The type of loans that will be included for sale in the NPL portfolio will consist of loans of all categories (retail and business). Although every entity would be more interested in buying loans which are well secured and have high collectability (such as mortgages), it is in the interest of the banking institutions to transfer loans belonging to all categories. The reason for this practice is that the credit institutions are able to achieve a better average price for categories of loans that, otherwise, would have to be sold at a very large discount (unsecured consumer loans, debts from credit cards, etc.). In our example the nominal value of the NPL portfolio to be bought is fixed at 1 billion euro.

Factor 2: The degree of collectability of the NPL portfolio that will be transferred. This characteristic (collectability) is somehow an exogenous one, with a large degree of uncertainty, being difficult to predict and depending on several factors, such as: the general institutional framework governing the procedures of enforced receipts and the effectiveness of this mechanism, the level and the depth of the market in which they are going to dispose of the assigned assets (e.g. real estate), the type of loans and the type of assets that operate as collaterals, as well as macroeconomic factors such as the stage of the macroeconomic cycle of the country (e.g. the increase or decrease of GDP, the rate of unemployment, the expectations for the future economic climate, etc.).[7] It has been international-

7. In simple words, as the future GDP increases so does the degree of recoverability of NPLs and this will enhance the IRR of entities that invest in bank loans.

ly observed that the percentage of loans' collectability increases when the NPLs are transferred to distressed funds. This percentage is generally estimated with an average value of 40%. In the sensitivity analysis which will follow, alternative scenarios will be presented that deviate from this value.

Factor 3: The redemption value of the NPL portfolio as a percentage of the initial nominal value. We must mention here that this percentage will be largely determined by the need of credit institutions for vital liquidity, the capital adequacy ratio, the degree of coverage of NPLs with collaterals, the amount of previous years' provisions for these loans, the amount of capital that will be required by the credit institutions to capitalized again if needed,[8] the subsidiary role of the State, etc. It should be also noticed that the redemption price of the NPLs will be one of the benefits that the credit institution will accrue by allocating them. In the benefits that will arise we should also add the manpower costs, the fixed assets savings, the economy from the use of information systems and several other costs. From the perspective of entities investing in NPLs, the redemption price depends on the assessment regarding the NPL's recoverability in the upcoming years, their interest for the country and the market, the potential synergies, etc. In our example the redemption price is set to the indicative rate of 7%, which largely determines the amount of the initial investment to be spent by the entity for the acquisition of the NPL portfolio (the latter results as a product of the redemption percentage to the nominal value of the portfolio). In the sensitivity analysis tables that follow, the resulting IRRs will be sought for different values of this variable.

Factor 4: The operating costs of the investing entities. In this article these costs are reported as a percentage of annual receipts. They also include staff costs, general operating expenses, costs of enforced recoveries, legal and judiciary costs, costs of auctions, etc.

Factor 5: The time horizon of an entity that invests in NPLs will be set as the maximum for the redemption of the loan portfolio of NPLs. This will take into account the fact that a large proportion of borrowers will seek to regulate the loans that they owe and to do so they will need time. In our example, this time is set at ten years.[9]

Factor 6: The average interest rate which the entity that invests in NPLs imposes on borrowers who have the ability to make an arrangement regarding the repayment of their debts. This rate will depend on the cost of money, which the entity faces, and the average repayment capacity that the borrower demonstrates (at this point the importance of the macroeconomic factors is reintroduced, such as the phase of the economic cycle, the level of unemployment, etc.). The average interest rate of loans in our case is set at 8%, which is relatively high but takes into account the current levels of interest rates in the country as well as the degree of the borrower's creditworthiness, which, of course, is considered as "very low". Additionally it is assumed, in our example, that 50% of the entities' annual revenues will come from loan arrangements and the rest from sales of assets that operate as the borrower's collaterals. The revenues of the entity are assumed to demonstrate an upward trend, reaching a peak level in the early years of the investment, through some divestitures of assets, and thereafter to decrease. For simplicity reasons, an increased cash flow in the early years is therefore expected, accompanied by a smaller and constant flow thereafter.

Factor 7: Finally, and in order to determine the annual return that the shareholders of the entity would expect, two additional factors must be taken into account: the market portfolio return and times over the market return that the shareholders of the entity require, in order to invest their funds. The market portfolio's return in our example is set to 15%.[10] Furthermore, it is estimated that shareholders of a high-risk entity, like the kind that we analyze in our example, would be satisfied with an annual compensated rate of return of 2-3 times above the market portfolio (an average of 2.5 times). Under

8. We note that as the redemption price of the NPL's portfolio decreases, the greater the possibility for heavy losses in the systemic banks' equity (provided that this redemption price falls short of the previous years' provisions) and, consequently, the need for a recapitalization arises. Hence, there is an inherent tug-of-war between the interests of the systemic banks and those of the funds investing in NPLs. Perhaps that difference, which is reflected in the discounted price of NPLs, could be bridged through the purchase of part of the bank's share capital from the entities investing in NPLs.

9. Note that a time horizon that exceeds 10 years is not considered as a real problem for the investing entities because they could transfer the remaining portfolio of performed loans back to the systemic banks, at the end of the agreed period, at a price that approximates the portfolio's nominal value.

10. According to Damodaran (2017), the overall risk return from investing in Greek equities amounts to 19.20% (January 2017). This approach also incorporates the country risk as this is affected by the classification (rating) of the country's debt. However, such risk return was considered as rather cyclically high so we decided to use the more moderate and realistic rate of 15%, which better reflects the long-term characteristics of such investment in the country.

these assumptions, the minimum return of an entity that invests in NPL is derived at 37.5% (see Table 1).[11]

In Table 1, the aforementioned seven (7) underlying factors (variables/parameters) are briefly presented. Additionally, an estimated average value appears for each one of them.

Based on the assumptions of Table 1, in Table 2 we present a typical cash flow finacial example, regarding the calculation of the IRR of an entity that invests in NPLs. Additionally, we assume here that the tax rate of this entity's revenues (excluding operating costs) amounts to 29% (Greek tax rate). Thus, based on the

TABLE 1 The basic factors of the portfolio of an entity that invests in bank loans

The data of the problem	
1. The nominal value of the NPLs portfolio (in 000,000 €)	1,000
2. The degree of recoverability of the NPLs	40%
3. NPL portfolio purchasing value (as a % of the nominal one)	7%
4. Operating expenses (as a % of the entity's annual receipts)	30%
5. The duration of the NPL portfolio receipts	120
6. Interest of loans*	8%
7a. The market portfolio return	15%
7b. The expected return of the "distressed fund" shareholder	2-3 times of the market portfolio return
7c. The required return of the NPL portfolio (2.5 × 15%)	37.50%

* It is estimated that approximately 50% of the amounts received will come from the interest-bearing settled loans. The remaining 50% of the revenues would come from asset disposals.

TABLE 2 The IRR calculation of an entity that invests in bank loans (baseline scenario) (in million €)

	The IRR calculation										
Year	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Annual revenues from interests and capital		29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12	29.12
Annual revenues from selling real assets		24.00	34.00	40.00	30.00	22.00	20.00	14.00	10.00	6.00	0.00
Total revenues		53.12	63.12	69.12	59.12	51.12	49.12	43.12	39.12	35.12	29.12
Operating expenses		15.94	18.94	20.74	17.74	15.34	14.74	12.94	11.74	10.54	8.74
Tax rate (29%)		10.78	12.81	14.03	12.00	10.38	9.97	8.75	7.94	7.13	5.91
Free cash flow (estimation)		26.40	31.37	34.35	29.38	25.41	24.41	21.43	19.44	17.45	14.47
Year 0: the NPL redemption value (% × nominal value of the NPL portfolio)											
Years 1-10: cash flows	-70	26.40	31.37	34.35	29.38	25.41	24.41	21.43	19.44	17.45	14.47
	IRR	**38.43%**									

11. In our example, the capital structure of the fund that invests in NPLs was not taken into account. Such an assumption could reduce the weighted average cost of capital (WACC) and enhance (to some extent) the shareholders' expected capital returns. Additionally, the issuance of different rating-yield bonds could be considered, with diversifying rights upon the entities' cash flow for the bondholders.

aforementioned initial assumptions (*baseline scenario*), the IRR of the entity that invests in bank loans in Greece is approximately 38.43%.

Sensitivity Analysis

The initial calculation of the IRR can be reexamined by applying a basic sensitivity analysis. This analysis presumes the "relaxation" of three (3) major factors (variables) of our example. So, in Tables 3 and 4, the alternative IRR results of an entity that invests in NPLs are presented. These IRR results are derived by relaxing: a) the redemption value of NPLs (1-discount), b) the degree of recoverability of the NPLs and, finally, c) the diversification of its operating expenses.

From the numerical results of Table 3 we end up with the following conclusions:

1) With a fixed rate of recoverability, the IRR of the entity that invests in NPLs decreases as long as the discount value decreases and *vise versa*.

2) At a fixed value of the acquisition on the NPLs portfolio, the IRR of the investing entity increases as soon as the degree of NPL recoverability increases, and the opposite is also true. Additionally, the lower the redemption value of the NPL portfolios, the higher the IRR of the entity for a fixed rate of the NPL's recoverability. For example, with a redemption value of the NPL portfolio at 5%, the IRR of the entity ranges from 40.7% to 59.4%, provided that the NPL's recoverability ranges between 30%-42%, relative to higher redemption values. Now, with a redemption value (of the NPL portfolio) at 9.5% for example, the derived IRR of the entity will range from 16.3% to 27.7% in accordance with the presented scale (range) of the NPL's recoverability.

3) There is also an efficient combination of these two important factors (the degree of recoverability and the discount value of the NPLs) which is colored in Table 3. Thus, of the two institutional agents (systemic bank or investing entity), the one with the greater bargaining power will impose its economic terms in this transaction. This means that if an entity that invests in NPLs has the power to impose its terms on the systemic bank, then it would achieve a very high discounted value (diagrammatically speaking, as left as possible in the horizontal line of Table 3) that will consequently increase its IRR disproportionately to the degree of NPL recoverability.

TABLE 3 The sensitivity analysis of an entity's portfolio* based on the NPL's discount value

% of NPL recoverability \ NPL portfolio purchases, as a % of its nominal value	5.0%	5.5%	6.0%	6.5%	7.0%	7.5%	8.0%	8.5%	9.0%	9.5%
30%	40.73%	36.31%	32.56%	29.32%	26.49%	23.98%	21.75%	19.74%	17.93%	16.27%
31%	42.33%	37.80%	33.95%	30.62%	27.72%	25.16%	22.87%	20.82%	18.96%	17.27%
32%	43.91%	39.27%	35.32%	31.92%	28.94%	26.32%	23.98%	21.88%	19.98%	18.25%
33%	45.49%	40.73%	36.69%	33.20%	30.16%	27.48%	25.08%	22.94%	21.00%	19.23%
34%	47.06%	42.18%	38.04%	34.48%	31.36%	28.62%	26.18%	23.98%	22.00%	20.20%
35%	48.62%	43.63%	39.39%	35.74%	32.56%	29.76%	27.26%	25.02%	23.00%	21.16%
36%	50.18%	45.06%	40.73%	37.00%	33.75%	30.88%	28.33%	26.05%	23.98%	22.11%
37%	51.72%	46.49%	42.06%	38.25%	34.93%	32.00%	29.40%	27.07%	24.96%	23.05%
38%	53.26%	47.91%	43.39%	39.49%	36.10%	33.12%	30.46%	28.08%	25.93%	23.98%
39%	54.79%	49.33%	44.70%	40.73%	37.27%	34.22%	31.51%	29.09%	26.90%	24.91%
40%	56.32%	50.74%	46.02%	41.96%	38.43%	35.32%	32.56%	30.09%	27.86%	25.83%
41%	57.84%	52.14%	47.32%	43.18%	39.58%	36.41%	33.60%	31.08%	28.81%	26.75%
42%	59.35%	53.54%	48.62%	44.40%	40.73%	37.50%	34.63%	32.07%	29.76%	27.66%

* We refer to the portfolio of an entity that invests in NPLs.

Note: The color differentiation in the Table represents an acceptable IRR level, on behalf of the NPL portfolio, which is calculated at 37.5%, at least.

TABLE 4 The sensitivity analysis of an entity's NPL portfolio based on the operating expenses

% of NPL recoverability \ Operating expenses of the investing entity	25.0%	26.0%	27.0%	28.0%	29.0%	30.0%	31.0%	32.0%	33.0%	34.0%
30%	29.12%	28.60%	28.07%	27.55%	27.02%	26.49%	25.95%	25.42%	24.88%	24.34%
31%	30.42%	29.88%	29.34%	28.81%	28.26%	27.72%	27.18%	26.63%	26.08%	25.53%
32%	31.71%	31.16%	30.16%	30.06%	29.50%	28.94%	28.39%	27.83%	27.26%	26.70%
33%	32.99%	32.42%	31.86%	31.30%	30.73%	30.16%	29.59%	29.01%	28.44%	27.86%
34%	34.25%	33.68%	33.10%	32.53%	31.95%	31.36%	30.78%	30.19%	29.61%	29.01%
35%	35.52%	34.93%	34.34%	33.75%	33.15%	32.56%	31.96%	31.36%	30.76%	30.16%
36%	36.77%	36.17%	35.57%	34.96%	34.36%	33.75%	33.14%	32.53%	31.91%	31.30%
37%	38.01%	37.40%	36.79%	36.17%	35.55%	34.93%	34.31%	33.68%	33.05%	32.42%
38%	39.25%	38.63%	38.00%	37.37%	36.74%	36.10%	35.47%	34.83%	34.19%	33.54%
39%	40.48%	39.84%	39.20%	38.56%	37.91%	37.27%	36.62%	35.97%	35.31%	34.66%
40%	41.71%	41.06%	40.40%	39.75%	39.09%	38.43%	37.77%	37.10%	36.44%	35.77%
41%	42.93%	42.26%	41.59%	40.93%	40.25%	39.58%	38.91%	38.23%	37.55%	36.87%
42%	44.14%	43.46%	42.78%	42.10%	41.41%	40.73%	40.04%	39.35%	38.66%	37.96%

Note: The color differentiation in the Table represents an acceptable IRR level, on behalf of the NPL portfolio, which is calculated at 37.5%, at least.

Table 4 examines the investing entity's profitability of the NPL portfolio, when operating costs vary. From the numerical results, listed below, the following conclusions emerge:

1) With constant recoverability of the NPL portfolio, the IRR of the investing entity decreases with the increase of its operating expenses.

2) The increase of the investing entity's operating expenses leads to a proportionally smaller reduction of its IRR, regardless of the degree of recoverability of loans. It is therefore obvious that every entity that invests in NPLs will pursue an increase of operating expenses if this leads to an increase of its NPLs' recoverability to the extent that the IRR of the entity increases.

3) With a darker color, in Table 4, the effective combination concerning the operating expenses and the degree of recoverability of the investing entity's NPL portfolio is presented. Therefore, the larger the operating expenses, the higher the required recoverability of loans should be expected in order to consider this investment project adequately profitable for its owners.

Apart from the aforementioned sensitivity analysis there are, consequently, two critical questions which arise here and are related to the context of the business operation of those investing entities (funds). More analytically:

1) Is it feasible for a borrower, by paying a little more than the purchasing value paid to the bank by the investing entity, to redeem the loan and thus to benefit from the difference? The answer to this question must be negative. First of all, if such an "agreement" was accepted, this could create an incentive for all banks' obligors to avoid repaying their debts, in order to benefit from the "arbitrage" just described. In other words, the banks' clients will intend to leave their debts unpaid and buy them again at lower prices when they are transferred, as NPLs, to the investing entity. But every entity expects a full return from every transferred problematic asset (NPL) that it buys. Additionally, due to the uncertain nature of the Greek economy, the investing entities cannot accurately schedule the extent of the NPL's repayment and therefore will seek the maximum possible return, which is equal to the nominal value of each loan that it has in its possession. So any form of individual loan "arbitrage" should not be expected, as a strategy, from the investing entity. Of course, we cannot neglect the possibility that in some isolated cases, partic-

ularly for loans that are inadequately collateralized or for borrowers with very low creditworthiness, the investing entity will proceed by liquidating part of the debt that ensures maximum expectancy performance. But we assume that this rule cannot be applied in general.

2) Is it possible for the systemic credit institutions, when we take into consideration the existing banks' provisions, to transfer their NPLs at such low discounted prices (e.g. 5-7.5%, see Table 1)? Such transfers could eventually lead to the recapitalization of the systemic banks, especially if the corresponding indicators that measure the banks (capital) adequacy have been overcome. And at this point, the key role of the State is introduced, as an ultimate regulator that could help through some fiscal policy incentives. In other words, the State may encourage the transfer of these NPLs to investing entities by legislating some more enticing and rewarding (higher) values for the credit institutions, e.g. by introducing smaller tax rates for these entities/companies.

5. Conclusions and policy proposals

The main aim of this article was to present a summary of the issues raised by the involvement of the so-called "investing entities" (funds) in the NPLs of the Greek banking system. Initially, the legal framework, within which these "investing entities" are expected to operate, was analyzed. The positive and the problematic parts of this framework were also addressed. Subsequently, through a pedagogic example, the expected IRR of an investing entity that acquires an NPL portfolio in Greece is presented. Within this framework, a sensitivity analysis, the impact from variations of the three (3) most intrinsic factors that determine the IRR of the investing entity, is presented. These factors are: the discount price of the purchased NPLs, the degree of the NPLs' recoverability and the operating expenses of the entity.

The activation of these "investing entities" in the NPL market of the Greek banking system has as a prime objective (for the banks) the exchange of NPL portfolios for cash liquidity at a discount price. Such exchange is expected to help systemic banks to repay their current short-term obligations (mainly the ELA) and also to finance some productive projects of the real economy.

However, from the aforementioned educational example, a high discount selling value of the NPLs, by the systemic banks, at a macroeconomic level may lead to the banks' recapitalization. On the other side, a low discount selling value of the NPLs reduces significantly the IRR of the corresponding "investing entity" (fund) and makes the investment less profitable. This tug-of-war, between systemic banks and funds, might possibly be "solved" by converting this difference to a financial participation of the latter in the systemic banks' equity. This can be realized either by the acquisition of contingent convertible bonds issued by the banks or by holding exchangeable shares of these banks. Note that the higher the expectations for economic growth in Greece, the bigger the incentive for the "investment funds/entities" to participate in the systemic banks' equity. This happens because any positive economic growth perspective is also linked to a higher degree of NPL recoverability and, consequently, higher IRR for the funds.

The adoption of an effective financial policy by the relevant State institutions was also highlighted. This should be accompanied by the legislation of a satisfactory regulatory framework, as indicated above. Such policies should be implemented in conjunction with fiscal support and be encouraged with some additional tax incentives (for both entities and banks). These actions will also facilitate lifting the NPL "weight" from the systemic banks while simultaneously removing the risk of a new recapitalization of the systemic banks. Finally, the systemic banks could contribute to the restructuring of heavily indebted companies and, consequently, to the potential growth of the Greek economy.

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