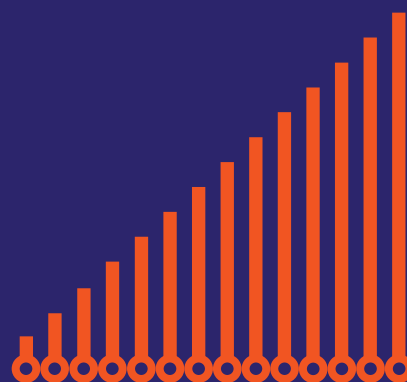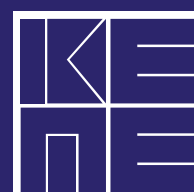# GREEK ECONOMIC OUTLOOK

- ■ **Macroeconomic analysis and projections**

- ■ **Public finance**

- ■ **Human resources and social policies**

- ■ **Development policies and sectors**

- ■ **Special topics**

Contents

Editorial

On 7 July 2017, the Board of Directors of the European Stability Mechanism (ESM) approved the disbursement of the third installment of the assistance programme to Greece, totaling €8.5 billion. This decision followed the approval of the Supplementary Memorandum of Understanding between Greece and its creditors, after the completion of the prerequisites of the second assessment of the financial program under the Financial Facility Agreement. The decision marked the end of a long, difficult and protracted negotiation: according to the initial plan, the second evaluation should have been completed by October 2016, while by the end of the same year both the question of debt relief and quantitative easing (QE) inclusion should have been finalised. The ongoing third evaluation contains a long list of 113 prerequisites, of which 95 must be implemented by the end of the year. The most crucial challenges relate to reforming labour laws and family benefits, opening certain closed professions and implementing changes in the public sector. Moreover, investment –which is a prerequisite for growth– is largely stagnant (Eldorado, Greek, Qatar, wind turbines in Evia) due to internal problems and resistance. In the international arena, German elections and Schäuble's departure from the Ministry of Economics has caused some concern, as it is unclear whether his replacement (possibly from the FDP) will continue Merkel's policy of support for the Greek programme. Moreover, the Catalonian referendum and the Spanish government's aggressive response have once more highlighted important issues of 'nationalist autonomy' in Europe, stirring up nationalists' hopes in the volatile Balkan region. At the same time neighbouring Albania is moving towards the abolition of its border with Kosovo, migrant flows are rising and Erdogan's anti-European attitude is growing. Europe's introversion, exacerbated by the pressures of ongoing major challenges –such as the increasingly tense negotiations on Brexit, the threat of terrorism (with several attacks in major European cities in 2017) and rising populist extremisim– is not a good omen for Greece.

The articles presented in the 34th issue of KEPE's *Greek Economic Outlook* offer an analysis of both the current developments in the Greek economy as well as more specialized and specific economic issues. Part One examines recent developments and prospects for the main components of demand and the Consumer Price Index in Greece and the Eurozone. An overview of the recent developments and prospects in the international macroeconomic environment as well as the factor model forecasts for short-term prospects of GDP are also presented. Public finances are examined through an analysis of the State Budget Execution (January-August 2017) as well as the evolution and structure of public debt. Moreover, recent developments in key variables of the Greek labour market are discussed, as well as key developments and characteristics of material deprivation in Greece. Finally, an overview of basic energy and environmental indices of the Greek economy is presented, followed by an analysis of the industrial sector based on industrial production and turnover indices. Part Two of the journal hosts four in-depth and specialised articles that focus on important current topics. The first article analyses the "Determinants of student academic performance: Evidence from an Economics Department". The second examines "Regional inequality indices for regional development policies", while the third presents an "Analysis of health expenditure in Greece during the period 2009-2015". Finally, the last article discusses "Migration flows and fiscal impact: A first approach".

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* for the first half of year 2017 (ELSTAT, provisional data, September 2017), the GDP of the Greek economy appears to be gradually returning to a path of recovery, recording an increase of 0.4% in the first quarter and 0.8% in the second quarter of the year, as compared to the corresponding quar-

ters of 2016 (Table 1.1.1). This course reflects the, at times, favourable developments in all key macroeconomic aggregates, but also the volatility still characterising the evolution of domestic demand components, particularly on the side of gross fixed capital formation.

More particularly, on the basis of the data in Table 1.1.1, the course of demand components appeared to differ considerably between the first and second quarter of 2017. Specifically, in the first quarter of the year, GDP growth was driven mainly by domestic demand, with the continuing mild increase in private consumption (1.2% on a y-o-y basis) being combined with a significant rise in investment (10.8%). On the contrary, in the second quarter of the year, the increase in GDP was led by developments in the external sector, and more particularly by a considerable acceleration of the rate of

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)

	2015Q3	2015Q4	2016Q1	2016Q2	2016Q3	2016Q4	2017Q1	2017Q2	6 month period Jan.-June 2017	2016
Private consumption	-4.1	-0.4	-0.7	-0.6	6.1	1.0	1.2	0.7	1.0	-0.6
Public consumption	0.8	2.5	-3.5	-1.5	-1.3	-2.0	-1.9	3.3	0.7	-2.5
Gross fixed capital formation	-5.2	13.9	-10.4	18.1	12.7	-14.0	10.8	-4.6	2.7	2.7
Domestic demand*	-2.7	1.6	-2.2	0.9	4.9	-1.3	2.1	0.5	1.3	-0.7
Exports of goods and services	-7.7	-2.7	-10.2	-10.3	10.8	5.0	5.2	9.5	7.4	-10.3
Exports of goods	6.5	10.1	2.0	3.8	8.3	-2.1	4.9	8.8	6.8	2.9
Exports of services	-22.3	-15.4	-21.8	-24.4	14.0	11.6	7.8	11.5	9.6	-23.1
Imports of goods and services	-14.1	-2.7	-10.2	-2.1	13.9	3.5	11.7	3.1	7.3	-6.2
Imports of goods	-7.7	3.5	-3.8	5.7	10.5	2.2	12.4	0.7	6.3	0.9
Imports of services	-39.2	-26.6	-32.0	-30.4	33.7	8.6	11.4	15.7	13.5	-31.2
Balance of goods & services	-127.7	-3.0	-9.2	190.6	-167.7	-12.2	87.6	-43.8	7.0	57.1
GDP	-2.4	0.7	-0.7	-0.5	2.0	-1.0	0.4	0.8	0.6	-0.6

Source: National Accounts, ELSTAT (September 2017), own calculations.

* Excluding the change in inventories.

Contributions to the rate of change of the real GDP

Domestic and net external demand

Legend:
- Changes in inventories
- Balance of goods and services
- Domestic demand (excluding inventories)
- Rate of change of the GDP

Individual components of domestic demand

Legend:
- Gross fixed capital formation
- Public consumption
- Private consumption
- Domestic demand (excluding inventories)

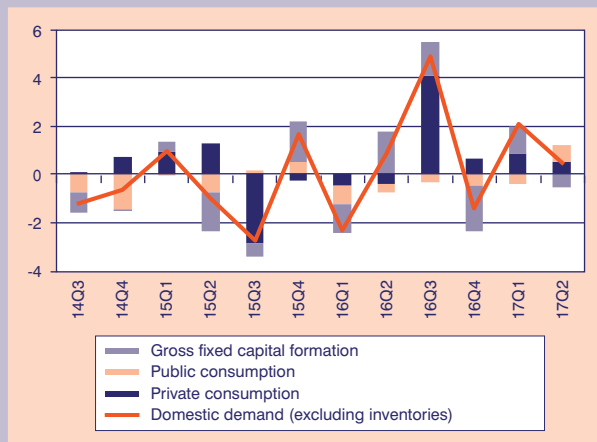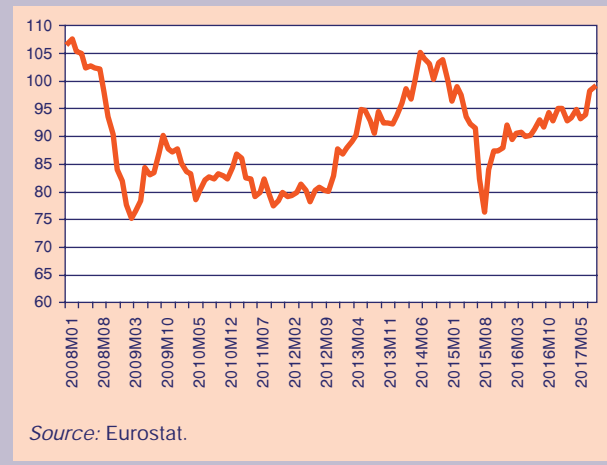*Source: National Accounts,* ELSTAT, own calculations.

FIGURE 1.1.2
Economic sentiment indicator

Source: Eurostat.

Focusing on the available indications with respect to the course of economic activity during the latest period, the economic sentiment indicator recorded small fluctuations in the course of the second quarter of 2017, thereafter exhibiting a major improvement in July and a further increase in August (Figure 1.1.2). This development, which is most likely related to the decline in uncertainty following the completion of the second review of Greece's financial assistance programme, as well as to the performance of the tourism sector during the peak season, lends support to indications of recovery and further improvement of economic conditions in the country.

Regarding the main factors shaping the recent 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

According to National Accounts data, the rising trend to which private consumption has reverted since the third half of 2016 continued in the first half of 2017, with the relevant rate of change amounting to 1.2% in the first quarter and 0.7% in the second quarter of the year. Additional indications on the recent course of private consumption are provided by the relevant trends with respect to the monthly volume index in retail trade. The index moved mostly upwards from January until June of 2017, thus recording in the first half of 2017[1] an average rate of change of about 0.9% against the corresponding period of 2016. Positive contributions

growth of exports of goods and services (to 9.5% from 5.2% in the first quarter of the year) in combination with a decline in the rate of change of imports (to 3.1% from 11.7% in the first quarter). Favourable developments in the external sector during the second quarter of the year compensated for the concurrent weakening of the dynamics of domestic demand which reflected a deceleration in the rate of growth of private consumption (to 0.7%) and a parallel decline in gross fixed capital formation (by -4.6%). Overall, the contribution of domestic demand –excluding inventories– to the rate of change of the GDP reached 2.1 percentage points in the first quarter of 2017, subsiding to 0.5 points in the second quarter of the year, while the corresponding contribution of the external sector amounted to -2.2 percentage points in the first quarter and 1.8 points in the second quarter of the year (Figure 1.1.1).

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

FIGURE 1.1.3

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

Legend: General volume index in retail trade — Food — Automotive fuel — Non-food

Source: ELSTAT, own calculations.
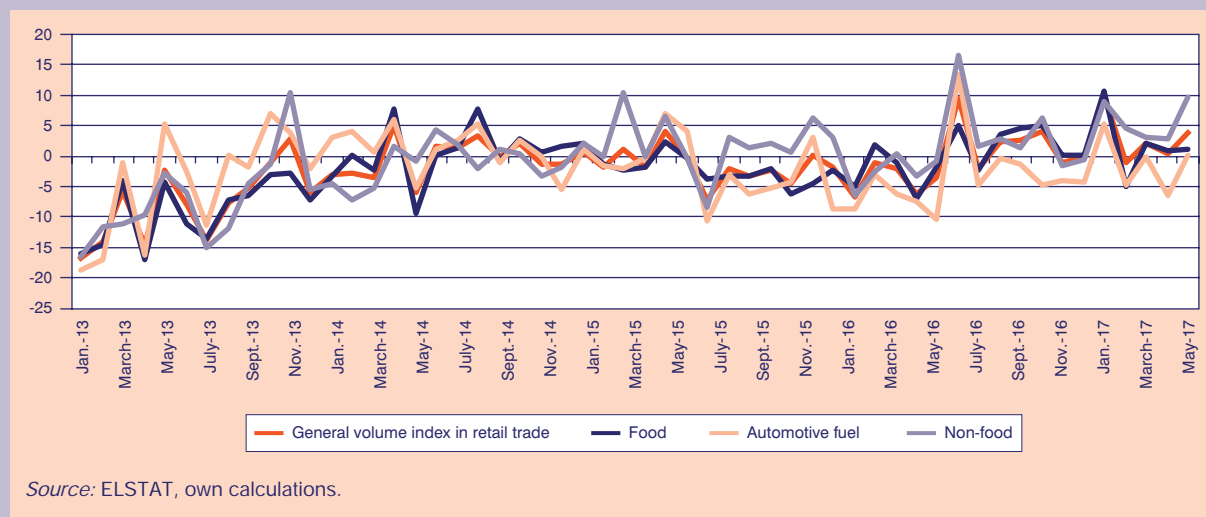
to the development of the general index came from the side of two out of the three main retail sector categories, and more particularly from the *food* sector and the *non-food* sector (average rates of change amounting to 0.5% and 2.3%, respectively) (Figure 1.1.3). In contrast, negative changes were observed in the case of the *automotive fuel* sector (-2.9%) (Figure 1.1.3).

With respect to the course of the volume indices in the *individual store* sub-categories, in four out of the eight cases, the first half of 2017 was characterized by overall positive developments. In particular, the indices referring to the *supermarkets, pharmaceuticals-cosmetics, furniture-electrical equipment-household equipment and books-stationery-other books* sub-categories recorded, on 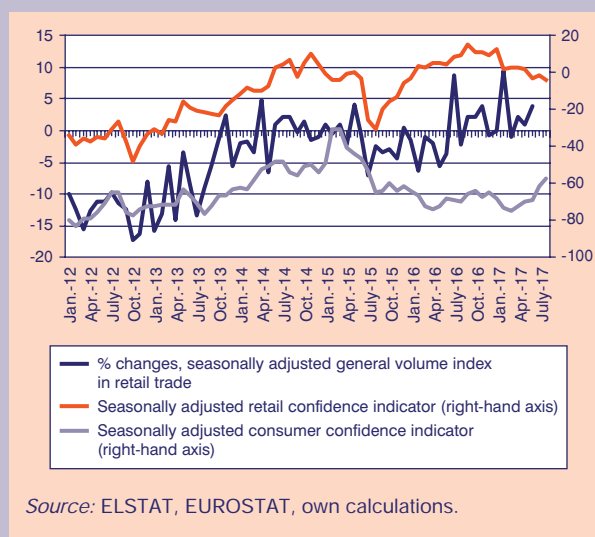average, positive percentage changes (amounting to 1.6%, 1.1%, 2.2% and 9.3%, respectively) as compared to the corresponding half-year period in 2016. On the contrary, the volume indices referring to the *department stores, automotive fuel, food-beverages-tobacco,* and *clothing-footwear* sub-categories declined, on average, over the same period (by -3.5%, -2.9%, -4.2% and -1.6%, respectively).

On the basis of the above data and indicators, it appears that private consumption is settling into a mild upward trend, with some intermediate intervals of volatility in certain individual store categories. These developments appear to signify that the positive impact on consumption from the further stabilization of the economic environment, the continuing improvement of the main labour market figures and the related recovery in the compensation of employees (1.9% on average in the first half of 2017 as compared to 2016, at current prices), outweighs the negative effects still

FIGURE 1.1.4

General volume index in retail trade and confidence indicators

Legend:
— % changes, seasonally adjusted general volume index in retail trade
— Seasonally adjusted retail confidence indicator (right-hand axis)
— Seasonally adjusted consumer confidence indicator (right-hand axis)

Source: ELSTAT, EUROSTAT, own calculations.

exerted due to the remaining uncertainty and the pressures on household disposable income from the implementation of fiscal adjustment measures.

Regarding the future developments in private consumption, the aforementioned trends with respect to the recent path of consumer spending converge to a positive assessment of short-term prospects. This assessment is in line with the improving expectations of consumers with respect to the course of their consumption expenditure, as reflected in the rising trend of the consumer confidence indicator during the period from April to August 2017 (Figure 1.1.4).

However, it is noted that retailers appear more cautious concerning the prospects of consumption, with the retail confidence indicator amounting in August 2017 to a level considerably lower compared to the beginning of the year. Therefore, a certain degree of ambiguity concerning the prospects of consumption still exists, thus emphasising the need for the further stabilisation of the economy and the reduction in uncertainty. Progress in this direction can play a crucial role both in curtailing the apprehension of consumers and in counterbalancing the continuous negative pressures on consumption from the implementation of fiscal measures imposing burdens on the disposable income of certain categories of households.

1.1.2. Investment

Gross fixed capital formation increased by 10.8% in the first quarter of 2017, but declined afterwards by -4.6% in the second quarter, as compared to the corresponding quarters of 2016 (Table 1.1.2). As a result, the contribution of investment to the rate of change of the GDP amounted to 1.1 percentage points in the first quarter of 2017 and -0.5 points in the second quarter.

More particularly, with regard to investment other than construction, developments in the course of the first half of 2017 were mixed. More particularly, expenditure in transport equipment recorded a major increase in the first quarter (155.7%) and a decline in the second quarter (-5.5%), while investment in other products exhibited a marginal increase in the first quarter (0.2%) and a slight decline in the second quarter of the year (-1.0%). In parallel, a reverse trend was observed in the case of expenditure in machinery and equipment, which recorded a small decline in the first quarter (-0.4%) and an increase in the second quarter (1.0%), while consistently negative developments were observed in the case of investment in Information and Communication Technology (-10.0% in the first quarter and -10.8% in the second quarter).

Concerning investment in construction, expenditure in other constructions decreased both in the first and in the second quarter of 2017 (by -9.4% and -9.3%, respectively). Moreover, investment in dwellings continued to decline over the same period (by -11.1% in the first quarter and -5.1% in the second quarter of the year).

Additional information on developments in the construction sector as a whole is derived from the available statistical data on the course of the general pro-

TABLE 1.1.2 Main investment aggregates
% rates of change compared to the corresponding period of the previous year (seasonally adjusted data, constant prices)

	Quarters								6 month period Jan. - June	
	2015Q3	2015Q4	2016Q1	2016Q2	2016Q3	2016Q4	2017Q1	2017Q2	2017	2016
Cultivated assets	-1.3	2.5	-2.6	1.0	-1.3	-2.3	1.2	-2.7	-1.0	-0.6
Other machinery and equipment and weapon systems	-15.7	4.0	-1.1	0.9	32.0	-4.9	-0.4	1.0	0.3	-0.1
Transport equipment and weapon systems	-8.0	-30.5	-43.7	122.0	-14.4	-35.1	155.7	-5.5	57.0	3.8
Information Communication Technology (ICT) equipment	-13.4	10.6	-8.4	0.1	14.8	-18.9	-10.0	-10.8	-10.4	-4.4
Dwellings	-36.2	-18.8	-17.0	-23.4	-3.3	-2.9	-11.0	-5.1	-8.1	-20.2
Other construction	-0.1	46.4	14.2	13.5	12.8	-16.7	-9.4	-9.3	-9.3	13.9
Other products	2.2	5.4	0.3	0.8	1.9	-1.5	0.2	-1.0	-0.4	0.5
Gross fixed capital formation	-5.2	13.9	-10.4	18.1	12.7	-14.0	10.8	-4.6	2.7	2.7

Source: National Accounts, ELSTAT (September 2017), own calculations.

duction index in construction in the first and second quarter of 2017.[2] As it is observed, the improvement in the index during the first quarter of 2017, expressed by a percentage change of 9.8% as compared to the respective quarter of 2016, was followed by a slight deterioration in the second quarter, amounting to -1.0%. This shift in the dynamics of the overall construction activity was due to the significant change in the conditions characterizing both infrastructure works and building construction. More particularly, with reference to the individual sub-index of production of civil engineering (which concerns, among other, highways, bridges, tunnels, pipelines, networks and port development), an increase of 26.8% in the first quarter of 2017 gave turn to a decline by -1.7% in the second quarter of the year, as compared to the corresponding periods of 2016. On the other hand, in the case of production of building construction (concerning, among other things, dwellings, industrial and commercial buildings and other buildings), the decline observed in the relevant sub-index during the first quarter of 2017 (-8.8%) seemed to have been contained in the second quarter of the year (-0.1%).

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 build-ing permits. Both the individual monthly observations of the residential buildings indicator and the estimated private building activity[3] exhibited significant improvement during the most recent reference period, in contrast to the aforementioned *National Accounts* data on investment expenditure in dwellings. More specifically, from January until May 2017, the monthly percentage changes of the residential buildings indicator on a year-on-year basis were positive, reaching even 85.3% (May). Accordingly, the rates of change of the estimated private building activity strengthened progressively, from 7.5% in January to 26.3% in May (Figure 1.1.5).

Overall, the observed volatility of investment expenditure from the second quarter of 2016 onwards points both to a tendency for significant recovery in gross fixed capital formation and to a recurring instability in investment dynamics. This instability appears to be related, on one hand, to changes in the economic climate and, on the other hand, to the adverse effects still exerted by the high taxation of businesses and real estate property and the considerable liquidity and financing problems in the market.

Concerning the prospects for fixed capital formation, developments in the short term are expected to be positively affected by the further stabilization of the economic climate, which is directly linked to the smooth implementation of the Greek programme. However, the gradual completion of large construction projects (roads, railways) which have thus far

FIGURE 1.1.5
Estimated residential building activity based on permits
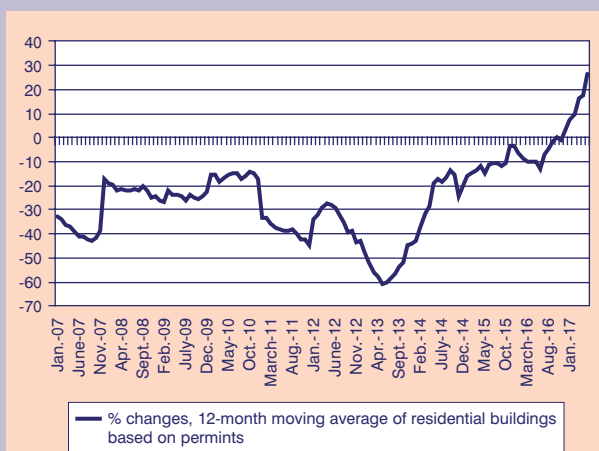
Source: EUROSTAT, own calculations.

FIGURE 1.1.6
Construction confidence indicator
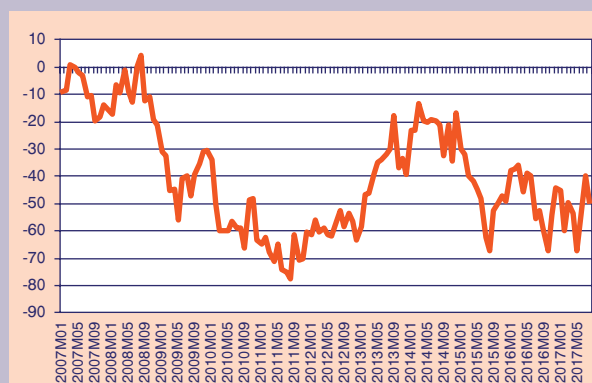
Source: EUROSTAT.

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2. Note that the reference concerns the indicator adjusted for the number of working days while data for the second quarter of 2017 are provisional.

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

contributed decisively to the volume of investment, emphasizes the need for speeding up the launch of new major investment projects related to the utilization of public property and the construction of new infrastructures included in the 2014-2020 structural funds programming period. Progress with these particular investments is currently of crucial importance, both for providing a direct boost to the domestic construction sector, where, based on the relevant confidence indicator, expectations have been volatile from mid-2016 onwards (Figure 1.1.6 above), and, more generally, for the purpose of supporting a steady turnaround in the country's investment climate.

1.1.3. External balance of goods and services

The progressive stabilization of the Greek economy, coupled with a series of favourable exogenous factors, among which is a considerable acceleration of world trade growth rates, had evident positive effects on the country's external sector during the first half of 2017.

More specifically, with respect to exports, their contribution to the rate of change of the GDP recorded a notable improvement, reaching 1.8 percentage points in the first quarter of 2017 and 2.9 points in the second quarter, compared to the corresponding quarters of the previous year (see Figure 1.1.7). More particularly, in the field of services exports a major increase was recorded, amounting to 7.8% in the first quarter of the year and 11.5% in the second quarter. A similar upward trend was also observed in the field of goods exports, with the relevant rates of change reaching 4.9% in the first quarter and 8.8% in the second quarter of the year. The rise in goods exports is related to positive developments in foreign demand, while also being likely to reflect a further improvement in competitiveness, indications of which can be found in the recent path of the country's real effective exchange rate. The favourable developments of services exports is due to the increase in tourism receipts (by 7.1% as a whole in the first half of the year, according to Bank of Greece data) and the boost in receipts in the other services and transporation services categories (by 32.3% and 17.9%, respectively). In the case of the latter, considerable positive effects were exerted both by the favourable developments in world trade and by the related higher levels of ocean shipping freight rates as compared to the corresponding period of the previous year.

With respect to imports, their contribution to the rate of change of the GDP was negative, amounting to -3.9 percentage points in the first quarter of 2017 and

FIGURE 1.1.7
Contributions to the rate of change of the GDP
Individual components of external demand
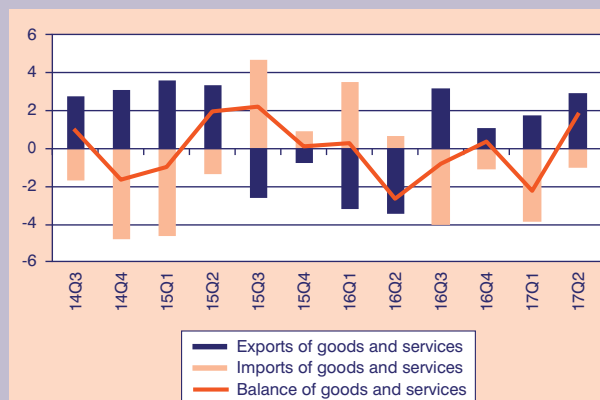
Source: National Accounts, ELSTAT, own calculations.

subsiding to -1.0 points in the second quarter. More particularly, in the field of goods the rate of change of exports moved from 12.4% in the first quarter of 2017 to just 0.7% in the second quarter, as market needs for imported goods in the latter period seemed to have been covered via the consumption of inventories. In the field of services, imports recorded a significant increase in the area of 11.4% in the first quarter and 15.7% in the second quarter of the year, with this development being due to the increase in payments for transportation and other services.

Concerning future developments in the external sector, the indications thus far available with respect to the country's exports performance as well as trends in word trade point to a prospect for further strengthening of goods and services exports. On the other hand, imports are expected to keep increasing, due to the foreseen recovery of domestic demand, and the expected higher oil prices as compared to the previous year. Consequently, a crucial role for the balance of the external sector and its contribution to the GDP will be played by the scale of export growth, as well as upon a possible gradual substitution of imported goods with domestically produced goods. In the current conjuncture, a decisive role for 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

The above analysis indicates a consistent process of gradual recovery of the Greek economy, with some

volatility as to the contribution of individual demand components to the rate of change of the GDP. An important positive characteristic of recent developments is the significant growth in goods and services exports, while the continuous moderate growth in private consumption is also notable. A tendency towards significant recovery is also apparent in the indications thus far available with respect to gross fixed capital formation, although the relevant data still exhibit a certain degree of volatility. These developments point to a prospect of continuing economic recovery in the upcoming quarters, which is consistent with the forecasts provided by the KEPE dynamic factor model (see Section 1.3).

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

Yannis Panagopoulos

Based on the recent trend (August 2017) of the headline CPI, as indicated from the first column of Table 1.2.1 and from Diagram 1.2.1, since January 2017 we have entered the inflation area. Thus the prolonged period of deflation in the country looks actually terminated. The new information is that after April 2017 the headline inflation lost its initial positive momentum and has actually stabilized around 1.0% (0.9% in August 2017). On the other hand, the core of the headline CPI, after May 2017, when it turned to positive changes, follows a slightly positive momentum (0.6%, July 2017), which is encouraging for the positive future of the headline CPI.

A similar trend, like the one of the headline CPI, is recorded for the Greek harmonized CPI (HCPI). More specifically, this index has moved to positive changes, from May 2017 onwards. However, it also lost its initial positive momentum and returned to weak percentage changes of around 1.0% or even less (0.6% in August 2017). We also observe that both CPIs (headline and harmonized) are currently moving with a similar percentage change. However, the core of the harmonized CPI is moving with a slightly higher percentage

change than the corresponding core of the headline CPI (actually with percentage changes of around 0.7% to 1.0%, between April and July 2017).

Additionally, according to the Hellenic Statistical Authority (ELSTAT), the aforementioned headline inflation rate (0.9%, y-o-y, in August 2017) can be mainly attributed to subsequent price increases in five (5) main sub-categories, namely:

(a) the "Alcohol, drinks and tobacco" category (by 7.4%) basically due to price increases in tobacco;

(b) the "Transportation" category (by 6.6%) mainly due to increases in the price of the gasoline and car lubricants. Part of this increase was offset by the decreases in the price of cars and airplane tickets;

(c) the "Housing" category (by 2.3%) due to increases in the prices of the housing heating and gas. Part of this increase was offset by the decreases in the prices of housing rents, electricity and solid fuels;

(d) the "Restaurants-Hotels-Cafés" category (by 1.8%) mainly due to increases in their prices;

(e) the "Communication" category (by 1.3%) mainly due to increased fees of telephone services.

Part of the aforementioned inflation was offset by the decrease in the prices mainly of seven (7) sub-categories, namely:

(a) the "Household equipments" category (by 3.3%) mainly due to decreases in furniture and decoration items, in household textile products, in the

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TABLE 1.2.1 Inflation in Greece and in the Eurozone

	Headline inflation (Greece)	Core inflation (Greece)	Harmonized inflation (Greece)	Core harmonized inflation (Greece)	Harmonized inflation (EU19)	Core harmonized inflation (EU19)
2017M2	1.3	-0.9	1.4	0.1	2.0	0.9
2017M3	1.7	0.1	1.7	0.6	1.5	0.8
2017M4	1.6	-0.2	1.6	0.7	1.9	1.2
2017M5	1.2	0.0	1.5	1.0	1.4	1.0
2017M6	1.0	0.4	0.9	0.7	1.3	1.2
2017M7	1.0	0.6	0.9	0.9	1.3	1.3
2017M8	0.9	NA	0.6	NA	NA	NA

Source: ELSTAT, EUROSTAT.

Note: NA: Not available data.

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

Source: ELSTAT, EUROSTAT.
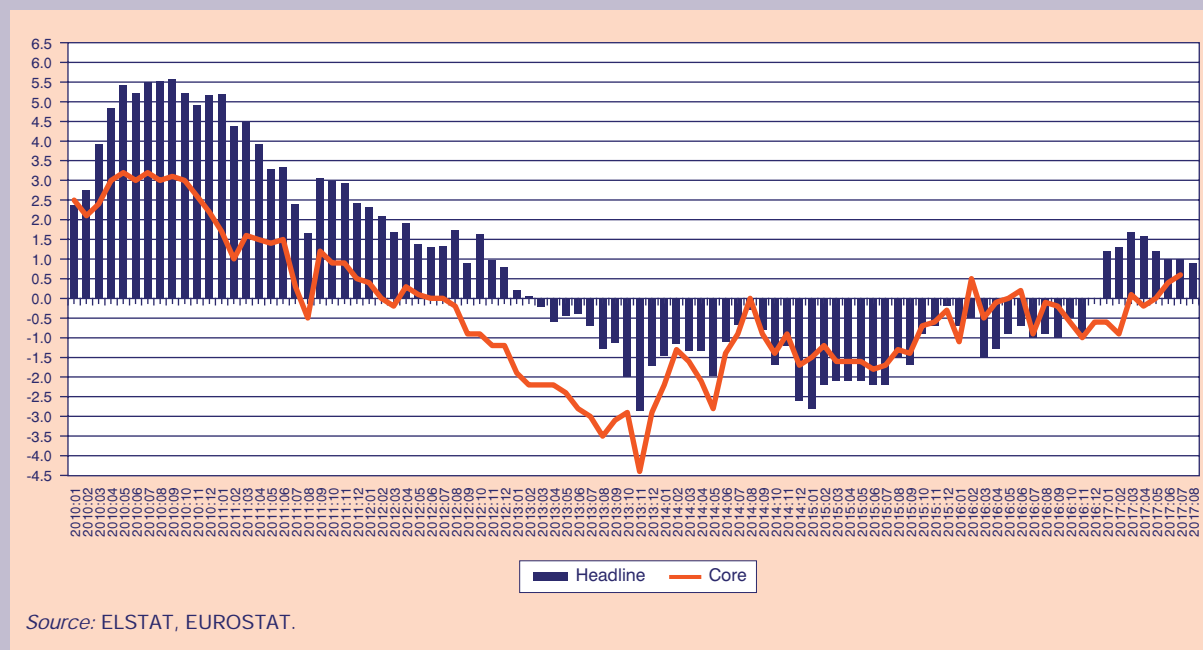
DIAGRAM 1.2.2
Harmonized indices of consumer prices, % change relative to the respective month of the previous years

Source: ELSTAT, EUROSTAT.
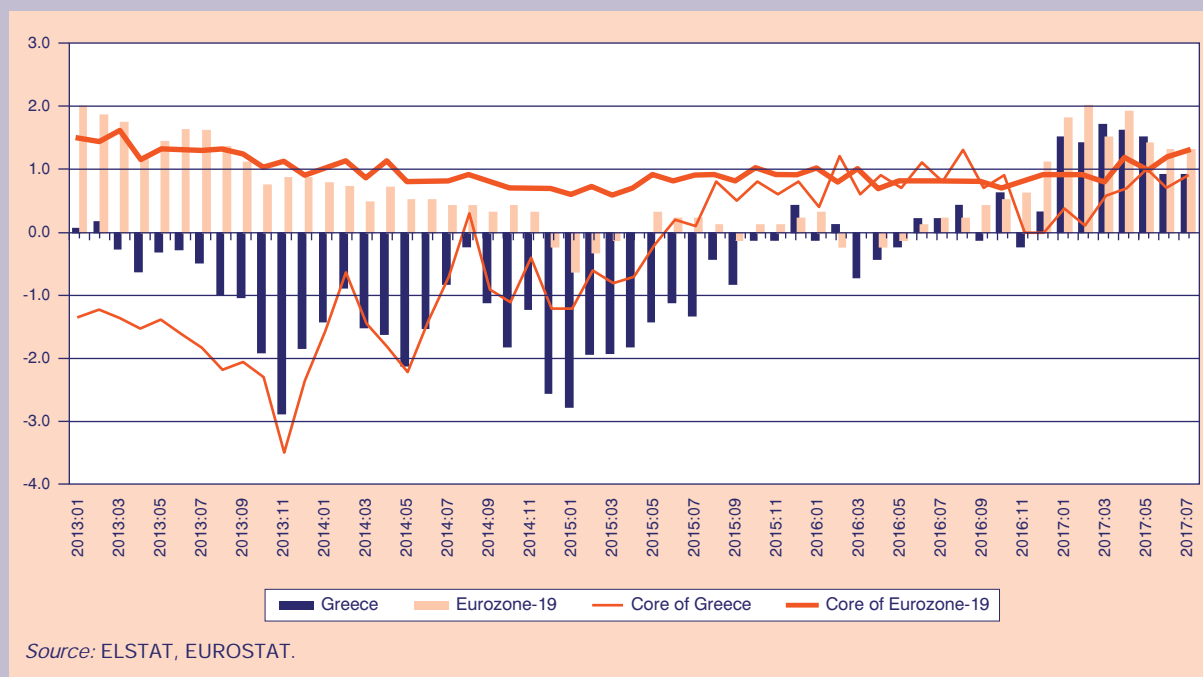
large household appliances (electrical or not), in household consumption items, as well as in the immediate household and care services;

(b) the "Miscellaneous goods and services" category (by 2.5%) basically due to reductions of the prices

of personal care products as well as of vehicle insurance;

(c) the "Health" category (by 2.4%) especially due to price decreases in nursing and paramedical services as well as in pharmaceutical products;

(d) the "Recreation and culture" category (by 1.5%) mainly due to decreases in the price of PCs;

(e) the "Clothing and Footwear" category (by 1.3%) due to price decreases for these products;

(f) the "Food and non-alcoholic beverages" category (by 1.1%), due to price decreases mainly in fresh fruits, fresh vegetables, fresh fish, potatoes, eggs, cereals, dried fruits and nuts. Part of this decrease was offset by increases in the price of olive oil and coffee;

g) the "Education" category (by 0.3%) mainly due to decreases in the fees for secondary schools.

As regards to the harmonized CPI of the euro area (HCPI-EU19) we can mention that in the last few months it has been moving with an upward trend of 1.3%-1.4%. This inflationary rate is, however, lower than the ECB target rate concerning inflation (almost 2.0%). At the same period, the core inflation of HCPI-EU19 (does not include unprocessed food and energy) has also continued to move with an upward trend of 1.2%-1.3%. On the other hand, from Diagram 1.2.2, we can observe that the Greek HCPI, after May 2017, is moving with a percentage rate slightly below 1.0%. Additionally, its core appears with a similar percentage rate (see Table 1.2.2).

In conclusion, both the Greek headline inflation and its core rate are falling short of the corresponding Eurozone rates (see Diagram 1.2.2).

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 for 2017.[1] 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 June 2017. 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.[2]

According to the econometric forecasts presented in Table 1.3.1, the mean rate of change of real GDP for the second half of 2017 amounts to 1.3%, while the individual estimates for the third and fourth quarter of 2017 lie at 0.4% and 2.2%, respectively, as compared to the corresponding quarters in 2016. Having incorporated published data for the first half of 2017, the mean annual rate of change of real GDP for 2017 is predicted at 1%. This forecast reflects a moderate improvement in economic conditions with respect to the previous year (-0.1%). Nevertheless, the predictions of the current reference period point to a downward re-

vision relative to the preceding factor model forecast (1.6%) for the same period.

The above presented forecasts of the rate of change of real GDP mirror the key dimensions of the most recent short-term developments in the Greek economy and are consistent with the trend indicated by the incorporated data for the first half of 2017. In particular, there are signs in favour of the gradual establishment of a stable, albeit modest, recovery path of the country, characterized by the apparent reinforcement of the growth process in the last quarter of the year. Such a development is in line with the activation of the anticipated positive effects arising from the completion of the second review on the country's programme, the rebalancing in major macroeconomic and fiscal aggregates, but also from the enhancement of the country's credibility. However, both the overall delay in the legislation and implementation of crucial reforms and the total financial burden weighing on households and enterprises seem to account for the overdue initialization of significant growth dynamics in the current juncture.

The above insights are consistent with the observed course in economic variables and, in particular, with the most recent statistical data (on a non-seasonally adjusted basis) concerning the second quarter

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

Quarters	2017	
	2017Q3	2017Q4
Quarterly rate of change	0.44 [0.38 , 0.50]	2.15 [2.03 , 2.26]
Mean rate of change, second half of 2017	1,29 [1,21 , 1,38]	
Mean annual rate of change	0.96* [0.92 , 1.00]	

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

*The mean annual rate of change incorporates the officially available (provisional) data for the first two quarters of 2017, on a seasonally adjusted basis using of the Demetra+ software.

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1. The date of the forecast is the 19th of September 2017.

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

of 2017. More specifically, significant indications of favourable trends are provided with regard to: (a) private consumption and exports, (b) basic industry indicators, such as the general industrial production index and the general turnover index in industry (overall and for both the internal and external markets), (c) retail trade, based on the general volume index, (d) travel and transport receipts, (e) private passenger cars, according to licenses issued, (f) building activity, based on permits issued, (g) wholesale trade, on the basis of the turnover index, (h) the Athens stock exchange, according to the General Index, (i) spreads, and (j) certain competitiveness indicators. Moreover, export expectations are quite optimistic, while the overall economic sentiment indicator for Greece is improving. Of utmost importance is, in addition, the continuation of the gradual reduction in unemployment (on an aggregate level, for the long-term and especially for the newly unemployed) and the preservation of the increasing trend in employment (on an aggregate level, in the secondary and the tertiary sector, in particular), despite the largely adverse conditions still prevailing in the domestic labour market.

On the negative side, a downward trend characterized, in the second quarter of 2017, one of the major GDP components, namely investment, as well as individual indicator categories in industry, expectations with reference to orders in manufacturing, individual categories of the volume index in retail trade, the production index in construction, business expectations on a sectoral level, unit labour costs and the turnover index for motor trade.

The predicted course of the real GDP in the country, as well as the overall domestic economic environment, might evolve according to a more or less optimistic scenario depending on a broad spectrum of crucial and decisive factors. These are intertwined, on the one hand, with the establishment of a friendly domestic environment for investment to flourish, but also with the support and promotion of key economic sectors, with the aim to boost the growth process and ensure sustainable job creation. On the other hand, these factors concern the accomplishment of a balance between the necessary economic measures overburdening households and enterprises, and their tax-paying and financial capacity to meet the obligations they face.

1.4. International macroeconomic environment: Recent developments and prospects

Yannis Panagopoulos

1.4.1. Overview

The aim of this article is twofold: to report and comment on the deviations of the predictions concerning the main macroeconomic variables with respect to the previously recorded one (see *GEO*,[1] Issue 33) concerning the global economy,[2] and to report the corresponding macroeconomic predictions for 2018.

It should be also noted that our analysis, while including the global dimension of the economy, is primarily Eurocentric (e.g. the Eurozone, the European Union [EU] outside the Eurozone, and EU candidate countries) due to the geographical, economic and political interests of our country. More analytically, the sections presented in this article include: the developed economies (G4), the Eurozone, the EU outside the Eurozone, the EU candidate countries and, finally, the developing economies. Special brief reference is also made to Greece at the end of the article.

Starting from the new macroeconomic projections concerning the GDP growth rate, the inflation rate, the unemployment rate and the "output gap" of the global economy for 2017, we see no particular changes in the forecasts (see Table 1.4.1). Specifically, the rate of global GDP growth is expected to remain at 3.5%, which is the average level of the previous GDP forecasts from the international organizations. The non-homogenous nature of this growth among different countries is, however, obvious. For the 2018, the global GDP growth-rate forecasts remain roughly the same with those of 2017, with a very small increase at 3.6% (see Table 1.4.2).

1.4.2. Developed economies (outside the Eurozone)

With the term "developed economies" we refer to the four most advanced economies (the G4: Canada, Japan, the USA and the United Kingdom [UK]). So, as it is reported from the Outlook of the various international organizations (see Table 1.4.1), a stable average growth rate for the G4 is estimated for 2017. Analytically, according to the EC[3] and to the IMF[4] reports, an average G4 growth rate of 2.0% is expected for 2017. On the other hand, the GDP average growth-rate forecasts for 2018 are expected to be slightly lower and in particular around 1.4%-1.6% (see Table 1.4.2). This small decrease in the expected GDP average growth rate in 2018 is possibly linked with the potential end of the loose monetary policy in the advanced economies, through raising the central bank rates.

The average inflation rate in G4 countries, for 2017, is expected to be around 1.7% to 2.0%. This inflation rate will be mainly affected by the moderate international fuel prices and the gradual fiscal expansion in most of these economies. For 2018, the expected average inflation rate will remain stable at 2.0%.

Regarding now the "output gap"[5] for 2017, the international organizations (especially the OECD) project variations from country to country. More analytically, we observe a small average positive increase in the "gap" of around +0.3% for all four advanced economies.[6] From the numerical evidence of Table 1.4.1, it is obvious that the G4 economies are very close to their production capabilities. On the other hand, based on forecasts of the IMF and the OECD, in 2018 a lower "output gap" is expected. Specifically, this "gap" will get close to zero (between -0.1% and -0.2%), which signifies that the G4 economies will soon reach their short-term production capabilities.

The average rate of unemployment (as shown in Table 1.4.1), in these advanced economies, is expected to continue moving at relatively low levels in 2017 (below 4.9%). Thus we do not anticipate any dramatic change in the projections of the average level of the unemploy-

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1. *GEO: Greek Economic Outlook*.

2. The sources for these predictions are the major international organizations (e.g. EC, IMF & OECD).

3. EC: European Commission, European Economic Forecast, Spring 2017.

4. IMF, International Monetary Fund, *World Economic Outlook*, 2017.

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

6. As a consequence of this, a slightly negative value regarding the "output gap" is expected for Canada and the USA and a slightly positive value for the UK and Japan.

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

	Real GDP (%)			Inflation (%)			Unemployment (%)			Output Gap (%, GDP)		
	EC	IMF	OECD	EC	IMF	OECD	EC	IMF	OECD	EC	IMF	OECD
Developed economies (G4)	1.7%[3]	1.9%[2] [+0.2%]	2.0% [+0.1%]	1.7%[3]	2.0%	1.9%	4.2%[3]	4.9%	4.6%	0.3%[4]	-0.4%	-1.3% [-0.3%]
The Eurozone	21.7%	1.9%[2] [+0.2%]	1.8%	1.6%	1.7%	1.7%	9.4%	9.4%	9.3%	-0.6%	-0.7%	-0.9% [+0.3%]
The EU (outside the Eurozone)	3.0%	2.6%	-	1.9%	1.6%	-	6.1%	6.5%	-	0.3%	-	-
Candidates for EU	3.2%	2.8%[1]	-	4.0%	2.6%[1]	-	16.2%	-	-	-	-	-
Developing economies	-	4.6%[2] [+0.1%]	-	-	4.5%[2]	-	-	-	-	-	-	-
Greece	2.1%	1.8% [-0.4%]	1.1%	1.2%	1.2%	1.4%	22.8%	22.3%	22.2%	-7.6%	-	-10.5% [+1.4%]
World	3.4%	3.5%[2]	3.5% [+0.1%]	-	-	-	-	-	-	-	-	-

Source: European Commission (EC), International Monetary Fund (IMF), Organization for Economic Cooperation and Development (OECD).

Notes:

* In brackets the changes with respect to the previous predictions.

a. G4: the USA, Canada, Japan, the UK.

b. The EU (other than the Eurozone): Croatia, Bulgaria, Denmark, the Czech Republic, Hungary, Poland, Romania, Sweden.

c. Candidates for EU: FYROM, Montenegro, Serbia, Turkey, Albania.

1. In the case of IMF, Bosnia/Herzegovina and Kosovo are added to the list. 2. International Monetary Fund (IMF, July 2017 update). 3. Without Canada. 4. Without Canada and Japan.

TABLE 1.4.2 The predictions for the main macroeconomic figures (2018)

	Real GDP (%)			Inflation (%)			Unemployment (%)			Output Gap (%, GDP)		
	EC	IMF	OECD	EC	IMF	OECD	EC	IMF	OECD	EC	IMF	OECD
Developed economies (G4)	1.4%[3]	1.5%[2]	1.6%	2.0%[3]	1.9%	2.0%	4.3%[3]	4.9%	4.6%	0.3%[4]	-0.1%	-0.2%
The Eurozone	1.8%	1.7%[2]	1.8%	1.3%	1.5%	1.4%	8.9%	9.1%	8.9%	0.0%	-0.3%	0.0%
The EU (outside the Eurozone)	2.8%	2.7%	-	2.0%	2.0%	-	5.6%	6.5%	-	0.7%	-	-
Candidates for EU	3.5%	3.5%[1]	-	3.8%	3.1%[1]	-	15.5%	-	-	-	-	-
Developing economies	-	4.8%[2]	-	-	4.6%[2]	-	-	-	-	-	-	-
Greece	2.5%	2.6%	2.5%	1.1%	1.3%	0.8%	21.6%	20.7%	20.1%	-5.2%	-	-8.3%
World	3.6%	3.6%[2]	3.6%	-	-	-	-	-	-	-	-	-

Source: European Commission (EC), International Monetary Fund (IMF), Organization for Economic Cooperation and Development (OECD).

Notes:

a. G4: the USA, Canada, Japan, the UK.

b. The EU (other than the Eurozone): Croatia, Bulgaria, Denmark, the Czech Republic, Hungary, Poland, Romania, Sweden.

c. Candidates for EU: FYROM, Montenegro, Serbia, Turkey, Albania.

1. In the case of IMF, Bosnia/Herzegovina and Kosovo are added to the list. 2. International Monetary Fund (IMF, July 2017 update). 3. Without Canada. 4. Without Canada and Japan.

ment rate. For 2018, the same average unemployment rate is also expected (see Table 1.4.2).

For 2017, the US economic growth rate projection, relative to the previous projections, is not expected to change and will remain at around 2.1%. In 2018, this GDP growth rate projection will be slightly higher (2.4%). Moreover, the US unemployment rate will remain stable at 4.6% in 2017 and will slightly fall to 4.3% in 2018. On the other hand, the inflation rate will slightly increase, by +0.3%, relative to the previous projection and will reach 2.5% in 2017, while it is projected to fall slightly at 2.2% in 2018. Finally, the US "output gap" is projected with a negative rate (-0.8%) in 2017 and a slightly positive rate (+0.1%) in 2018. This implies that the US economy will reach its short-term production capabilities next year.

As regards to Japan, a slightly improved growth rate, at 1.4%, is expected for 2017, while for 2018 this will be reduced to almost 1.0%. The unemployment rate will be around 3.0%-3.1% and the inflation rate will move marginally above zero (0.6%-1.0%). Japan's "output gap" is estimated to remain at a positive rate for both examined years (with +0.9% and +1.1%, correspondingly).

For Canada, a slightly higher economic growth rate at 2.8% is expected for 2017 (+0.4% higher than the previous February predictions), while in 2018 this growth rate will be reduced to 2.3%. On the other hand, the unemployment rate will remain at a high level (around 6.5%) for 2017, which is slightly lower than the February predictions. In 2018, this rate will be further reduced to 6.1%. Regarding now the "output gap" of the country, it is expected to switch from -0.7% in 2017 to +0.2% in 2018 (close to the country's short-term production capabilities).

The main macroeconomic variables of the UK economy continue to function under the uncertainty of the expected Brexit. In general terms, a small reduction of the expected GDP growth rate is projected (-0.2%, relative to the February's predictions), which is now measured at 1.6%, while, for 2018, it will be further reduced to 1.0%. However, on the issue of the unemployment rate, a small reduction at 4.8% is estimated for 2017 which, due to the projected slowdown of the GDP rate in 2018, will be further increased to 5.3%. Additionally, the inflation rate will be stable around 2.7%-2.8% in both successive years. Finally, as regards to the "output gap", a slight improvement (by +0.3%) relative to February's positive rate is expected. Thus, for both years, the "output gap" in the UK is estimated to be around +0.4%. This prospect is in line with the estimated slowdown in the GDP rate of the UK economy.

1.4.3. The Eurozone

Based on the macroeconomic outlook (Tables 1.4.1-1.4.2), the average economic growth in the Eurozone is expected to move with a (moderate) average rate similar to that presented in the previous *GEO* volume (no. 33). Actually, this GDP growth rate is expected to reach 1.8% for both 2017 and 2018 (+0.1% to +0.2%, higher than the previous forecast for both successive years). In more detail, this growth rate will come from a number of factors such as the moderate fiscal expansion, the relative loosening of monetary policy and the improved domestic demand. A positive contribution will also be attributed to the growth of exports.

Concerning now the expected "output gap" of the Eurozone, we should report that there are some changes with respect to the previous projections for both examined years. More specifically, an increased negative rate of this "gap" to -0.9% (from -0.7%, of February's estimations) is expected for 2017. Additionally, for 2018, the "output gap" is expected to be reduced to nil (0.0%). This evidence indirectly signals that the gradual progress of the Eurozone's economic growth is close to its short-term production capabilities.

Regarding now to the inflation rate, the expectations for 2017 are for a stable rate of around 1.7%. For 2018 this rate is projected to be around 1.4%.

Concerning now the labour market and the unemployment rate, there are some signs of marginal improvement of the unemployment rate, but not for the employment rate. More analytically, for 2017, the unemployment rate is now estimated to move around 9.3%, which is -0.1% lower than February's estimation. On the other hand, for 2018 the unemployment rate will further be reduced to 8.9%. Regarding the employment rate, an annual rate of 1.4% and 1.1% is projected for the two consecutive years, respectively.

Concerning now the Balance of Payments (BoP), we can comment that, for both 2017 and 2018, a surplus with the rest of the world is expected, with a rate of +3.3% and +3.4% of the total Eurozone GDP, correspondingly.

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).[7] Of course, these countries are not considered as homo-

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7. We talk about the countries: Croatia, Bulgaria, Denmark, the Czech Republic, the UK, Hungary, Poland, Romania and Sweden.

geneous since they belong to different economic categories. In simple words, we have the countries of the former Eastern bloc, which try to fulfill gradually the requirements for accession to the euro (see Croatia, Bulgaria, the Czech Republic, Hungary, Poland and Romania)[8] and countries who choose to abstain, for the time being, from the euro (see Denmark and Sweden).[9] Additionally, as we can also see in Tables 1.4.1 and 1.4.2, in the second category of countries/economies we have only small variations concerning the expectations of their main macroeconomic variables.

Regarding now the first sub-category of countries (i.e. the former Eastern bloc), it is important to mention that, for 2017, the GDP growth rate will range between 2.9% and 3.6%. On the other hand, for 2018, the expected growth rate will be reduced between 2.6% and 3.4%. The country with the highest growth rate, from this sub-group of countries, will be Hungary (with 3.8% and 3.4%, for the two consecutive years). At the unemployment issue, the rates are anticipated to be between 3.3% and 5.2% in 2017, without any significant change for 2018. The country with the highest unemployment rate will be Poland while Croatia will be the country with the lowest value.

Concerning now the second sub-category of the developed economies, moderate GDP growth rates are re-confirmed for both. More analytically, growth rates of 1.6% and 2.1% are expected for Denmark for the two consecutive years (2017 and 2018, respectively). Regarding Sweden, the corresponding growth rates are projected slightly higher (2.7% and 2.3%, for 2017 and 2018, respectively). Finally, relatively low unemployment rates are also anticipated in these two economies, with percentages lower than 6.5% for both Sweden and Denmark.

1.4.5. Candidate countries for accession to the EU[10]

The prime element that characterizes this group of countries is that it primarily covers the Balkan Penin-

sula. Unfortunately, there is no new macroeconomic information with respect to February's projections. The most memorable comparative element of this group, as illustrated in Tables 1.4.1 and 1.4.2, is the differentiation of forecasts from country to country and for both considered years (2017 and 2018). In conclusion, a slight improvement, by +0.3%, is expected for the average GDP growth rate in this group of countries (from 3.2% in 2017 to 3.5% in 2018) while the average unemployment rate of this group will reveal a small fall (from 16.2% in 2017 to 15.5% in 2018).

1.4.6. Developing economies[11]

The emerging and developing economies are expected, first, to have a slightly higher GDP growth rate (by +0.1%) compared to the previous projections (see vol. 33, Table 1.4.1). More specifically, an average GDP growth rate of 4.6% is expected for 2017, which is the highest growth rate from all groups of countries. This high growth rate will be increased, in 2018, to 4.8%. Additionally, the highest average inflation rate among all groups is also expected for 2017 (4.5%) and 2018 (4.6%). However, this average inflation rate varies significantly from country to country.

Additionally, as in the previous volume, we will briefly report the projections regarding the main aggregate macroeconomic variables of the major countries of this group. These countries are: China, Brazil, Russia and India.

Starting from China, we can say that for 2017 the GDP of the country is expected to grow with a rate of 6.6% while a small reduction is projected for 2018 (6.4%). This growth rate is considered as a positive development and it is based on expansionary fiscal and monetary policies. The fixed investments (basically infrastructure) also play a positive role in this growth rate while the high global growth rate is expected to boost further China's exports. On the other hand, the inflation rate will be decreased to 1.5% in 2017 and then in 2018 will be slightly increased (2.0%).[12]

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8. There are no new macroeconomic data for all those countries. Therefore, in this article the analysis will be restricted to only three: the Czech Republic, Hungary and Poland.

9. Due to the uncertainty of the expected Brexit, the UK is the only country which is not analysed in this group. It is analysed in the G4 group.

10. We talk about the countries: FYROM, Montenegro, Serbia, Turkey and Albania. In the case of IMF projections, Bosnia and Kosovo are added.

11. The specific group of countries, as the IMF report describes, includes five (5) different sub-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, North Africa, Afghanistan, Pakistan and of sub-Saharan Africa.

12. No available data exists regarding the unemployment rate and "output gap" forecasts of China.

Brazil aggregate macroeconomic figures look better than expected and therefore the country possibly will finally emerge with a slight growth rate for 2017 (+0.7%). For 2018 this growth rate is expected to increase further to 1.6%. Finally, the inflation rate is estimated to decline from 8.7% in 2016 to 4.2% in 2017 and 4.5% in 2018.[13]

As regards to Russia, like Brazil, it also demonstrates some signs of stabilization after two years of recession (2015 and 2016). More specifically, while for 2016 the recession was limited to -0.2%, for the current year a noticeable recovery is expected (+1.4%), while for 2018 this recovery will be slightly higher (+1.6%). For the inflation rate, a sharp decline from 7.2% in 2016 to 4.2% in 2017 and 4.0% in 2018 is projected.[14]

In the case of India, a high and stable GDP growth rate of around 7.3% is projected for 2017. An even higher GDP growth rate is anticipated for 2018 (7.7%). Finally, a relatively stable inflation rate is estimated for the country for the two successive years (4.8% and 4.6%, respectively).[15]

1.4.7. Greece

Regarding Greece now, the final expected GDP growth rate for 2017 demonstrates some deviation among international organizations, ranging from 1.1% to 2.1% (see Table 1.4.1) while, for 2018, it is expected to move at a higher level which ranges from 2.5% to 2.6% (see Table 1.4.2). The employment rate is gradually beginning to grow in the country, supporting the level of private consumption, while the higher aggregate demand of products from overseas helps the exports' increase. Additionally, in the first semester of 2017, investments seem to improve although, in the second semester, a small slowdown in this improvement is expected to appear.

As regards to the country's "output gap", due to the idiosyncracies of the Greek economy, no converging views appear among the international organizations. Indeed, as we can observe from Tables 1.4.1 and 1.4.2, the existing projections vary considerably from -7.6% up to -10.5% in 2017 and from -5.2% up to -8.3% in 2018.

In the Greek labour market (unemployment rate) we observe some small deviation in the reports of the different organizations (see Table 1.4.1). More analytically, the unemployment rate for 2017 is expected to range between 22.2% and 22.8%. This deviation is projected to be slightly smaller for 2018. More specifically, the unemployment rate is expected to be reduced and move between 20.1% and 21.6% (see Table 1.4.2). Finally, inflation in the country is expected to be relatively stable around 1.1% and 1.4%, respectively, for those two successive years.

Finally, as regards to the fiscal issues, a small public deficit of the total General Government is expected for 2017 (-0.2% of the GDP). This budget deficit is expected to be the same in 2018.

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13. No available data exists for the "output gap" of Brazil.

14. No available data exists for the "output gap" of Russia.

15. No available data exists for the unemployment forecasts in India and for the "output gap".

2. Public finance

2.1. State Budget execution, January-August 2017

Elisavet I. Nitsi

According to the most recent data retrieved from the General Accounting Office[1] the execution of the State Budget in the period January-August 2017, on a modified base, has improved in comparison with the corresponding period of 2016, as well as the targets set, as they were reflected in the executive summary of the State Budget for the fiscal year 2017. More specifically, according to the data shown in Table 2.1.1, the State Budget balance had a deficit amounting to 1.26 billion euros against a deficit of 2.68 billion euros in the corresponding period of 2016 and a target being set by the State Budget at 2.90 billion euros, while it was slightly higher from the Medium-Term Fiscal Strategy 2018-2021 (MTFS) target of 1.23 billion euros compared to the same period in 2016. Accordingly, the State Budget Primary Balance had a surplus of 3.55 billion euros against a primary balance of 2.12 billion euros compared to the same period in 2016, and 1.45 billion euros from the primary deficit target. It also lags from the MTFS target estimate of 3.57 billion euros.

Moreover, State Revenues decreased compared to the corresponding period of the previous year, amounting to 31.44 billion euros, decreased by 0.61 billion euros or 1.90%, while they are lagging compared to the target set for revenues both by the MTFS (set at 33.18 billion euros, which is a loss of 1.74 billion euros or 5.25%) and by the Budget, which amounted to 33.76 billion euros, decreased by 2.32 billion euros or 6.86%. The decreased revenues in relation to the MTFS can be attributed mainly to the fall of Ordinary Budget revenues, amounting to 30.25 billion euros, while the lag against the target set by the Budget can be attributed to the decrease of both the Ordinary Budget revenues,

by 1.39 billion euros or 4.39, and the Public Investment Program (PIP), by 0.93 billion euros or 43.84%.[2]

On the other hand, the State Budget shows a decrease in expenditure, amounting to 32.70 billion euros, lower by 2.03 billion euros or 5.84% over the eight months of 2016. Expenditures are clearly reduced compared to the target set by the MTFS, of 34.41 billion euros, falling short by 1.70 billion euros or 4.95%, as well as by the Budget, as 3.03 billion euros or 8.47% less was spent. This fall in expenditure is due to both the decrease of the Ordinary Budget expenditure (4.42% compared to the corresponding period last year) and the PIP (27.12%).

More specifically, the expenditure of the Ordinary Budget amounted to 31.12 billion euros, showing a decrease by 1.44 billion euros versus the same period of 2016, while expenditures are less by 1.18 billion euros against the MTFS target and by 1.66 billion euros against the State Budget. The reduction of the Ordinary Budget expenditure can be attributed to both the reduction in primary expenditure, which amounted to 26.31 billion euros, reduced compared to the same period in 2016 by 1.54 billion euros or 5.23%, and by 2.0 billion euros or 7.26% and 1.20 billion euros or 5.23% compared to the target set by the MTFS and the State Budget, respectively. On the contrary, interest paid, amounting to 4.82 billion euros, is slightly higher, by 14 million euros or 0.29% compared to the corresponding period of 2016, as it is marginally lower, 17 million euros or 0.35% and 45 million euros or 0.94%, than the targets set by the MTFS and the Budget, respectively.

The significantly higher primary surplus of the first eight months of 2017, compared to the estimate made in the 2017 Budget Report, creates optimism for achieving the primary surplus target in 2017. This development is mainly due to the expenditure reduction, 8.47% compared to the 2017 Budget and 4.95% to the MTFS, but there is a significant revenue shortfall compared to the targets set by the Budget (6.86%), but mainly with the MTFS (5.25%), which was passed relatively

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

2. The exact distribution among the revenue categories of the Ordinary Budget will be made when the final State Budget Execution Monthly Bulletin is issued.

TABLE 2.1.1 State Budget execution, January-August 2017 (million €)

| | Jan.-Aug. 2016 | Jan.-Aug. 2017 | | |
	Outcome	Outcome	Targets MTFS[1]	Budget Targets[2]
State Budget				
Net Revenue	32,047	31,439	33,180	33,755
Expenditures	34,731	32,703	34,406	35,728
Ordinary Budget				
Net Revenue	29,980	30,248	32,007	31,636
Expenditures	32,559	31,121	32,304	32,780
- Primary expenditure	27,757	26,305	27,506	28,009
- Interest payments (on a cash basis)	4,801	4,815	4,798	4,770
Public Investment Program (PIP)				
Revenue	2,067	1,190	1,173	2,119
Expenditures	2,172	1,583	2,102	2,481
State Budget Primary Balance[3]	2,117	3,550	3,573	1,452
State Budget Balance	-2,684	-1,265	-1,226	-2,898

Source: General Accounting Office, Greek Ministry of Finance.

Notes:

1. Targets of the Medium-Term Fiscal Strategy 2018-2021, adjusted to the aggregate figures as reflected in the estimates of the MTFS Explanatory Report.
2. Targets as they were reflected in the executive summary of the State Budget for the fiscal year 2017.
3. + surplus, - deficit.

recently (May 2017) with the completion of the second assessment of the economic program under the Financial Assistance Facility Agreement. This deficit in the ordinary revenues was expected to arise due to the reduced tax collection rate as the exact distribution among the Ordinary Budget revenue categories was not available. This development exhibits the limitation of Greek taxpayers' ability to respond to their ever-increasing taxation, and thus doubts about their ability to pay and, consequently, further delays in revenue collection arise. If this is true, reaching the target of a surplus of 1.75% of GDP for 2017 may be difficult.

2.2. The evolution and structure of public debt

Christos Triantopoulos

The level of public debt, in terms of the General Government, is estimated, according to the Medium Term Fiscal Strategy Framework (MTFS) 2018-2021, to enter a phasing-out period, mainly in GDP terms, but also in absolute terms – in the context, of course, of the continuation of the country's fiscal adjustment and stabilization path. In particular, according to the MTFS 2018-2021, General Government debt is projected to reach €319.4 billion (or 176.4% of GDP) in 2017, from €314.9 billion (or 179% of GDP) in 2016, and to be limited to €316 billion (or 149.6% of GDP) in 2021. This is a significant development, which, in terms of GDP, is reflected in the decline of the public debt as a percentage of GDP ratio by 30 percentage points over the period 2016-2021, as a result of estimations for (relatively) high growth rates of domestic economic activity for the coming years; a (less) positive effect on this indicator is the reduction of public debt in absolute terms (Figure 2.2.1).

It is worth noting, however, that in the MTFS 2018-2021, along with the positive developments in the debt profile (achieved in previous years) and the positive estimates for the macroeconomic environment, other factors are also taken into account: the impact of the repeated primary surpluses, the implementation of the privatization proceeds program and the expected debt's relief following the implementation of the agreed measures aiming at ensuring its sustainability within the framework of the country's economic policy program.

Unlike the MTFS 2018-2021 projections, the European Commission appears less optimistic about the evolution of the General Government debt, as it estimates that in 2017 it will stand at €324.7 billion (or 178.8% of GDP), while in 2018 it is expected to increase further to €328.8 billion (174.6% of GDP). This deviation in estimates regarding the evolution of the level of public debt is not based on the projections for the evolution of the (nominal) GDP–where there is a significant convergence between the MTFS 2018-2021 and the European Commission projections on the macroeconomic environment; it is based on the public debt projections in absolute terms, the European Commission estimating that it will increase by around €14 billion in the period 2016-2018 (Figure 2.2.2).

In terms of the Central Government, when intergovernmental debt is not taken into account (e.g. short-term borrowing through repos agreements with General Government entities), the level of debt in 2017, according to the General Government Monthly Bulletin for July, has been maintained at €326,425 million compared to €326,359 million at the end of 2016 (Table 2.2.1). The fact, however, that characterized the debt management in July 2017 was the first suc-
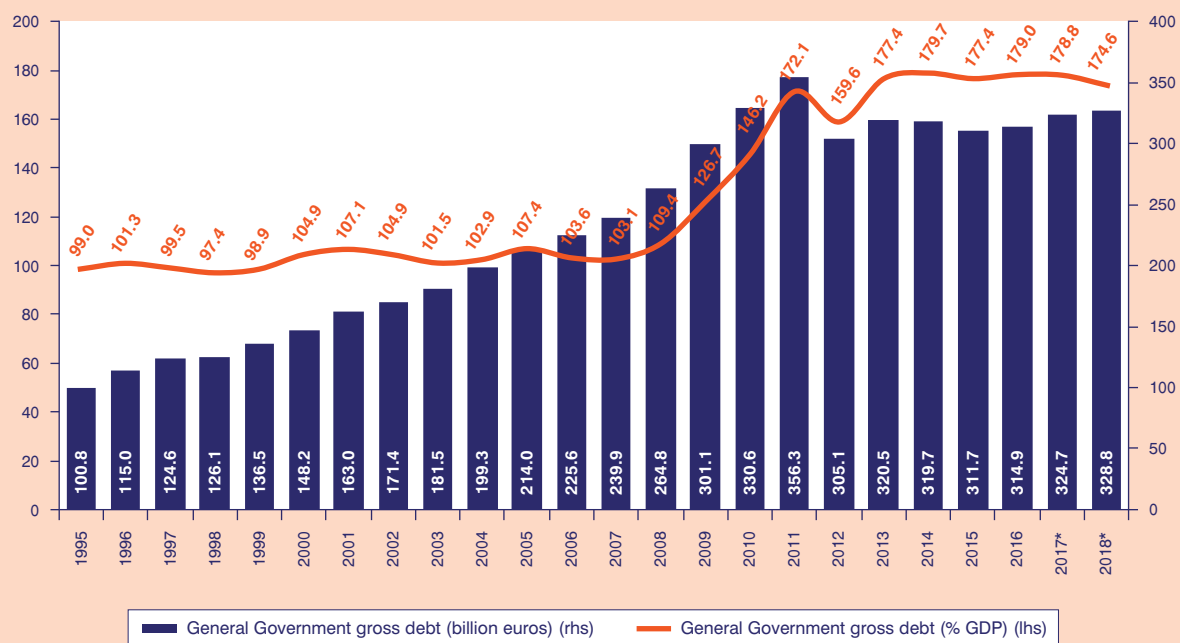

FIGURE 2.2.1
General Government debt (2015-2021)
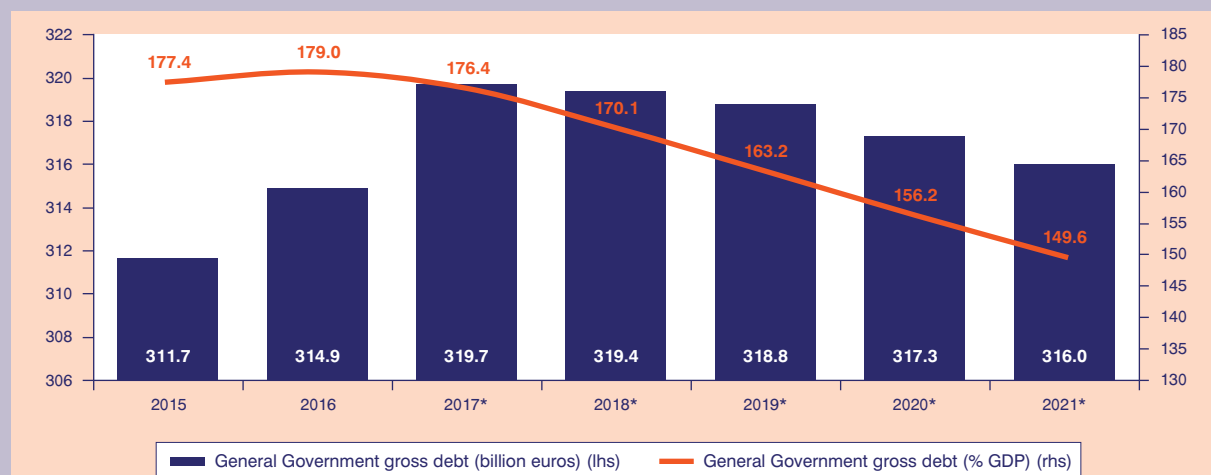
Source: MTFS 2018-2021.

Note: * Forecasts.

FIGURE 2.2.2
General Government debt (1995-2018)

Source: European Commission, AMECO database.

Note: * Forecasts.

TABLE 2.2.1 Structure of Central Government debt

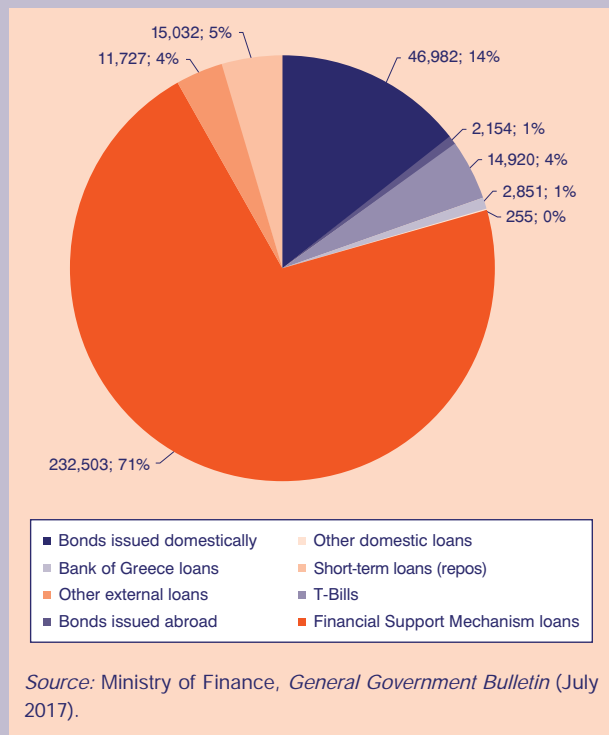|	2011		2013		2016		July 2017	
	Million euros	% of debt	Million euros	% of debt	Million euros	% of debt	Million euros	% of debt
A. Bonds	**259,774.18**	**70.6**	**76,296.25**	**23.7**	**56,718**	**17.4**	**49,136**	**15.1**
Bonds issued domestically	240,940.37	65.5	73,415.28	22.8	54,354	16.7	46,982	14.4
Bonds issued abroad*	18,833.81	5.1	2,880.97	0.9	2,364	0.7	2,154	0.7
B. T-Bills	**15,058.63**	**4.1**	**14,970.82**	**4.7**	**14,890**	**4.6**	**14,920**	**4.6**
C. Loans	**93,145.19**	**25.3**	**230,210.90**	**71.6**	**243,388**	**74.6**	**247,337**	**75.8**
Bank of Greece	5,683.99	1.5	4,734.61	1.5	3,321	1.0	2,851	0.9
Other domestic loans	836.71	0.2	115.50	0.0	188	0.1	255	0.1
Financial Support Mechanism loans	73,210.36	19.9	213,152.48	66.3	227,660	69.8	232,503	71.2
Other external loans**	13,414.13	3.6	12,208.31	3.8	12,219	3.7	11,727	3.6
D. Short-term loans*	**0.00**	**0.0**	**0.00**	**0.0**	**11,363**	**3.5**	**15,032**	**4.6**
Total (A+B+C+D)	367,978.00	100.0	321,477.97	100.0	326,359.00	100.0	326,425	100.0

Source: Public Debt Bulletin (December 2011, December 2013, December 2016) and General Government Bulletin (July 2017).

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

FIGURE 2.2.3
Central Government Debt (July 2017),
(million €; % debt)

FIGURE 2.2.3
Central Government Debt (July 2017),
(million €; % debt)

- Bonds issued domestically
- Bank of Greece loans
- Other external loans
- Bonds issued abroad
- Other domestic loans
- Short-term loans (repos)
- T-Bills
- Financial Support Mechanism loans

Source: Ministry of Finance, *General Government Bulletin* (July 2017).

cessful attempt –after two debt issues in 2014– to raise Central Government funding (see: Public Debt Management Agency) from the international markets through the issuance of a five-year bond (worth €3 billion), part of which was repaid (swapped) by a bond that expires in 2019. This development and the recovery of funding flows from the support mechanism (to repay bonds that expired in the first half of 2017) resulted in a very different structure of the Central Government debt in July 2017 in relation to the end of 2016.

In particular, the share of Central Government debt in bonds was reduced to 15.1% of debt (€49.1 billion) in July 2017, compared with 17.4% of debt (€56.7 billion) in 2016, while the share of debt in Financial Support Mechanism loans increased –in the same period– to 71.2% of debt from 69.8% of debt in 2016. Thus, in July 2017 loans from the Financial Support Mechanism amounted to €232.5 billion compared to €227.7 billion in December 2016 (Table 2.2.1). In addition, Central Government funding remains at the same level as in the previous months, through short-term securities and, in particular, Treasury bills, which remained constant at €14.9 billion (Figure 2.2.3).

On the other hand, short-term loans by General Government entities through repos continued their upward

FIGURE 2.2.4
Central Government short-term loans (repos)
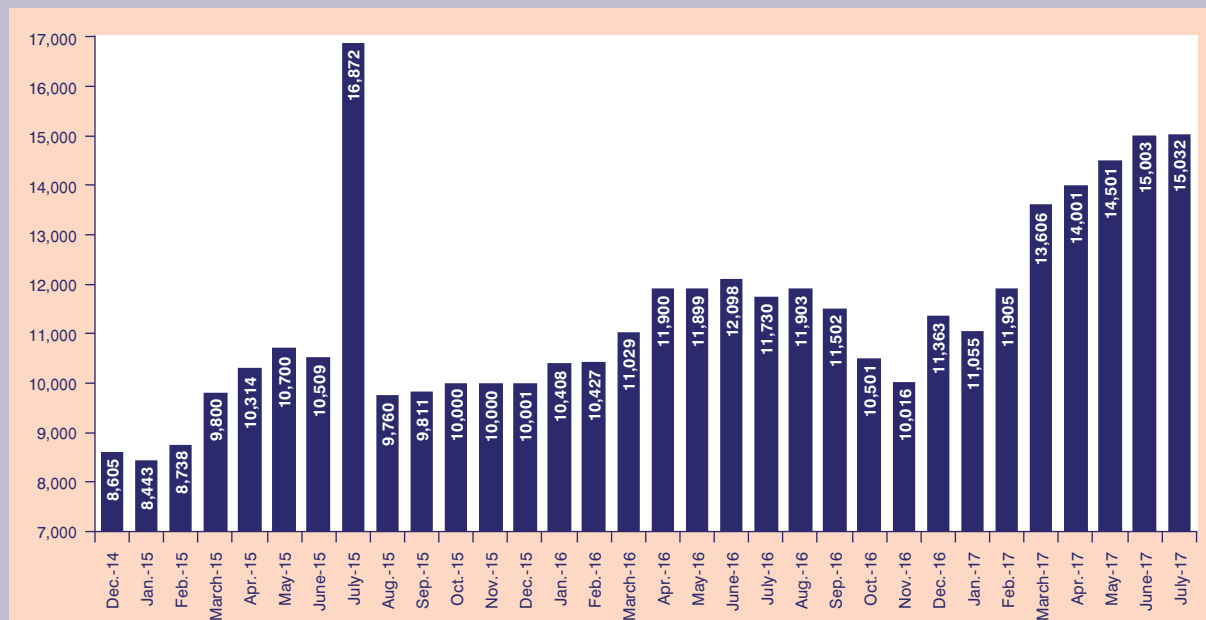
Source: Ministry of Finance, *General Government Bulletin* (various months).

Note: The July 2015 performance is widely diverted as it includes the short-term "bridge" loan of €7.16 billion from the European Financial Stability Facility that Greece received during the period between the second and third adjustment programs.

TABLE 2.2.2 Composition of Central Government debt

	December 2011	December 2012	December 2013	December 2016	June 2017
A. Rate					
Fixed rate[1]	62.0%	32.7%	28.5%	30.0%	34.6%
Floating rate[1,2]	38.0%	67.3%	71.5%	70.0%	65.4%
B. Trade					
Tradable	74.7%	34.3%	28.4%	21.9%	21.6%
Non-tradable	25.3%	65.7%	71.6%	78.1%	78.4%
C. Currency					
Euro	97.5%	96.7%	95.9%	97.0%	97.0%
Non-Euro area currencies	2.5%	3.3%	4.1%	3.0%	3.0%

Source: Public Debt Bulletin (December 2011, December 2012, December 2013, December 2016, June 2017).

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

trend as in the previous period. In particular, Central Government short-term loans through the sale of repos to General Government entities, due to delays in the planned installments, have increased by around €4 billion since the beginning of the year, and slightly exceeded €15 billion in July 2017, from €11 billion in January 2017. Moreover, according to the July 2017 data, short-term loans (through repos) now account for 4.6% of Central Government debt (Figure 2.2.4).

As noted in previous relevant analyses, alongside the structure of Central Government debt, changes also occur in the Central Government's debt profile. Thus, in June 2017, the share of non-tradable debt increased to 78.4%, while its share at a floating interest rate stood at 65.4%, contrary to what was the case before 2012,

as the debt composition has been strongly influenced by the country's financing through the Support Mechanism, which is based on non-tradable and floating rate loans (Table 2.2.2). Of course, the large exposure of public debt to floating rate securities increases the interest rate risk, which can be limited through the implementation of the measures envisaged to be promoted over both the short-term and the (medium and) long-term period under the Support Mechanism. These are structural measures that, combined with fiscal stability (in the context of the program), the development of conditions and trends of economic growth and the gradual recovery of access to international markets, will strengthen the long-term sustainability of the country's public debt.

3. Human resources and social policies

3.1. Recent developments in key labour market variables

Ioannis Cholezas

3.1.1. Introduction

In the first semester of 2017 unemployment decreased further. The rate for the general population reached 22.2% compared to 24% in the first semester of 2016. On the other hand, employment increased in the first six months, but the bulk of that increase took place in the second quarter, fuelled by the tourist sector's seasonally increased economic activity. This seems to be verified by the net inflows of paid employees which originate mainly from the tourist sector and, additionally, by the reduction of full-time job contracts during the summer. Gender, education and region of residence shape both unemployment and employment rates. In particular, the increase in the number of employed tertiary education graduates suggests that the economy is growing based on processes that require a skilled labour force, but there could be alternative explanations also. Moreover, it seems that in some regions the number of employed individuals declined in the past year, while even in those areas where an increase was recorded, performances diverge significantly. Thus, a more thorough investigation is appropriate. In any case, labour force participation data do not seem to favour the discouragement hypothesis due to limited employment opportunities, which is a good thing. Finally, data on wages reveal a slow increase, which has yet to counterbalance the losses of the past.
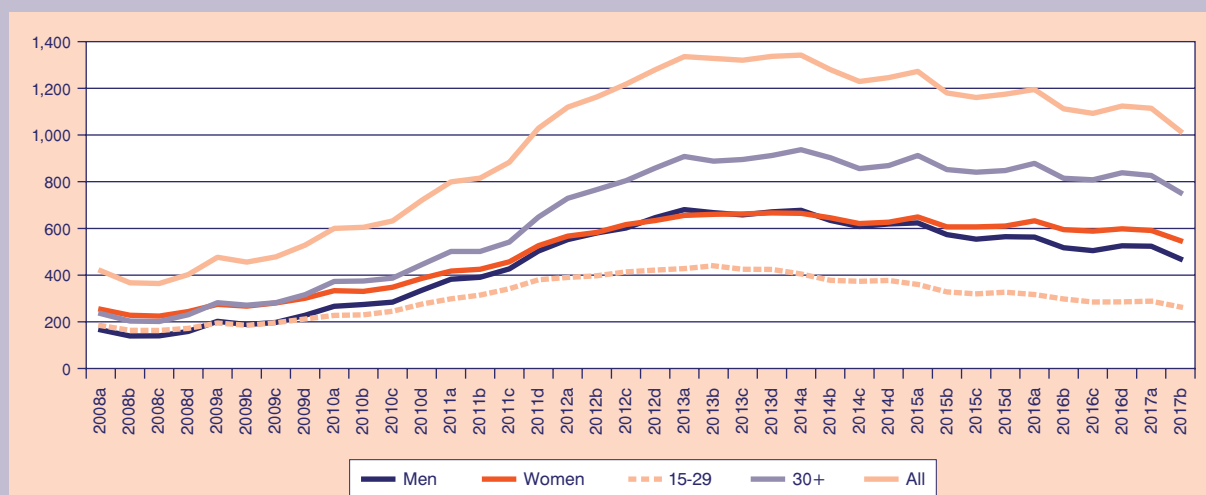
3.1.2. Unemployment

Compared to the last quarter of 2016 some 9.3 thousand fewer unemployed were registered in the first quarter of 2017. In the second quarter, that decrease reached 98.1 thousand, compared to the first quarter, as a result of the intense seasonality characterising the economic activity in Greece, especially tourism. Therefore, the unemployment rate for the general population decreased to 21.1% in the second quarter of 2017, two percentage points lower compared to the second

quarter of 2016, and continued the fall that had started a couple of years ago. That percentage change represents a fall in the number of the unemployed equal to 107.4 thousand people year-on-year.

Men face a lower unemployment rate than women: 18.7% in the first semester of 2017 compared to 26.6%. The reduction in the number of the unemployed is slightly faster for men also. Therefore, in the first semester of the year there were 56 thousand fewer unemployed men and approximately 51 thousand fewer unemployed women. In the second quarter of 2017 (April-June) the gender unemployment gap declined further and reached 7.8 percentage points. On the other hand, the ratio of unemployment rates remained unchanged at 1.4 and almost stable since 2014. Note that before the crisis broke out, that ratio was above 2, which means that women faced double the unemployment rate compared to men. Nevertheless, the size of the unemployment rates is not comparable between the two periods. Lastly, there are still more unemployed women than unemployed men.

The unemployment rate for youth aged 15-29 dropped slightly to 35% in the second quarter compared to 38.3% in the first quarter and 40.9% in the second quarter of 2016. At the same time, individuals aged above 30 faced an unemployment rate of 18.6%. The reduction in the youth unemployment rate, although not big, has its own value since it indicates that the labour market integrates unemployed youth more easily. Subsidised jobs especially for youth have certainly contributed to that. Overall, in the first semester of the year the number of unemployed youth decreased by 31.3 thousand and unemployed individuals over 30 decreased by 56.7 thousand compared to the respective period in 2016. The difference in the course of the unemployment chances by age is also evident when comparing the last quarter of 2016 to the first quarter of 2017: unemployed youth increased by 2.9 thousand, while the unemployed over 30 decreased by 12.2 thousand. This is probably due to the greater absorption of youth by seasonally volatile sectors, such as tourism. Lastly, the ratio of the unemployment rates (youth/over 30) has remained constant at 1.9, which means that youth have almost double the chances of being unemployed compared to people over 30. That ratio has been practically the same since 2013. Note that the ratio reached up to 3.1 in the third quarter of 2007, i.e. before the crisis

GRAPH 3.1.1
Unemployed by gender and age (in thousands)

Source: Labour Force Survey, ELSTAT, KEPE processing.

broke out. It should also be noted that even though the ratio exhibits a limited dispersion, the same does not hold for unemployment rates, so that the severity of the problem varies. For instance, in the third quarter of 2007 the unemployment rate for youth was 16.9% while it was 5.5% for people over 30.

Combining gender and age gives interesting results. The reduction in unemployed youth in the first six months of 2017 seems to involve mostly young men (22.4 thousand) and less so young women (8.9 thousand). Moreover, it involves mostly unemployed women over 30 (35.5 thousand) and less so unemployed men of the same age (21.2 thousand). Specifically, in the first quarter of 2017, the number of unemployed young men declined by 0.5 thousand, while the number of unemployed young women declined by 2.5 thousand. With respect to individuals over 30, the reduction in unemployed women dominated (instead of an increase in younger individuals) that of men (9.6 thousand vs. 2.6 thousand). The reduction in the second quarter of the year is almost equally driven by men and women (38.4 thousand and 34.6 thousand, respectively), but when it comes to youth (15.6 thousand vs. 9.5 thousand), men take the lead. Therefore, it seems that changes in the unemployment rate in the first semester involve mostly women above 30 and least so younger women. Thus, it seems that age matters most among women when it comes to unemployment prospects in the first semester of 2017.

The unemployment rate varies across graduates from different levels of education, in some cases considerably so. Although the unemployment rate increased during the crisis for all groups of graduates, differences amongst them were aggravated. In the first semester of 2008, for example, upper technical and vocational education graduates faced an unemployment rate of 10.1%, when Master and/or PhD holders faced a 5.4% unemployment rate. In the first semester of 2017 the second group continued to face the lowest unemployment rate, which has doubled in the meantime (10.4%), while lower secondary education graduates faced an unemployment rate equal to 26.1%. That means that the spread between the highest and the lowest unemployment rate by level of education soared from 4.7 percentage points to 15.7 percentage points.[1] The good thing is that compared to the first semester of 2016, the spread has declined, thus it is likely that the decline in the unemployment rate for the general population will contribute to the reduction of inequalities traced in the unemployment prospects of graduates from different levels of education. Additional evidence in favour of that argument is the increase in the share of graduates from the three top levels of education (over the total number of unemployed) over the past year and the reduction in the share of graduates from the lower levels of education.

In the first semester of 2017 (compared to the respective semester of 2016) lower secondary education graduates saw their unemployment rate decline

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1. The ratio of the standard deviation to the arithmetic mean leads to a similar conclusion.

TABLE 3.1.1 Unemployment rate by level of education (1st semester, %)

	2008	2016	2017
Master and/or PhD	5.4	11.5	10.4
University	5.5	17.9	16.4
Upper technical and vocational	10.1	24.7	23.5
Upper secondary	8.5	26.2	24.2
Lower secondary	8.6	29.1	26.1
Primary or less	6.6	25.2	24.6
Total	7.9	24.0	22.2

Source: Labour Force Survey, ELSTAT, KEPE processing.

the most compared to other graduates, followed by upper secondary education graduates (Table 1). On the contrary, the lowest decrease was documented amongst primary education graduates and those with fewer years of education and Master and/or PhD holders. Graduates from higher levels of education face relatively low unemployment rates, which is partly an explanation of why they present such a small annual decrease. Primary education graduates or those with fewer years of education, on the other hand, also face a weak decrease in the unemployment rate. That should cause some concern with respect to their ability to get a job, even when the unemployment rate falls. Note that these people represent approximately 12% of the total number of the unemployed (i.e. 263 thousand people).

There were differences in the unemployment rate of regions even before the crisis started, but it seems they have shrunk during it.[2] Comparing 2017 to 2016 shows that there are three regions in which the number of the unemployed increased: Epirus, the Ionian Islands and the north Aegean islands. The biggest contribution to the pool of the unemployed came from the North Aegean islands (5.6 thousand persons). The number of the unemployed declined in the rest of the regions. The biggest decrease in the number of the unemployed was documented in Sterea Ellada (17.2%) followed by Crete (16.9%) and Thessaly (16.3%). Nevertheless, Attica had the biggest negative contribution to the pool of the unemployed over the past year (24.9 thousand), followed by Thessaly (13.4 thousand). As a result, the unemployment rate in the first semester of the year ranged from 17.5% in the Peloponnese to 30% in West Macedonia.

3.1.3 Employment

On an annual basis the general employment rate increased by approximately one percentage point and reached 40.6%. This means that approximately four out of ten people over 15 years of age were employed in the first semester of 2017. Since the last quarter of 2016, employed individuals increased by 142.8 thousand; 132 thousand of those were new jobs created in the second quarter of the year and were occupied mostly by women (52%). Compared to the first semester of 2016 (annual change) the number of the employed increased by 70.9 thousand people. More than half of those jobs were occupied by men over 30 (56%) followed by women of the same age group (35.3%). Youth aged 15-29 occupied 8.7% of the new jobs, which corresponds to 6.2 thousand jobs for youth and 64.7 thousand jobs for people over 30. Within the youth age group it seems that those younger than 25 did better, both men and women, while the number of the employed aged 25-29 declined. This decline involves mostly men (-8.8 thousand). On the contrary, employed young women aged 20-24 exhibited the biggest increase. Turning to group 30+, it turns out that the decrease was driven by the employed aged 30-44 irrespective of gender, although women recorded a bigger decrease (11.6 thousand). Therefore, it can be concluded that in the first semester of 2017, the employed aged 25-29 and 30-44 exhibited the biggest decrease, always compared to the respective period in 2016, while the number of the rest of the groups increased.

As discussed in previous issues of the *Greek Economic Outlook*, the increase in the number of the employed is driven primarily by flexible types of employment. Part-time employment is one of these types. It is characteristic that the share of the part-time employed increased from 6% in the first semester of 2008 to 10.9% in 2016 and to 11.4% in 2017. This means that even during the past year, the increase in the number of jobs in-

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2. The spread between the highest and the lowest unemployment rate increases, but the standard deviation adjusted to the arithmetic mean decreases over time. This means that outliers grew stronger, but the distribution became more homogeneous. On the other hand, the ratio of the highest to the lowest unemployment rate suggests that heterogeneity across regions has indeed shrunk over time with respect to the unemployment rate.

TABLE 3.1.2 The employed, by gender and age (1st semester)

	Number (thousand)			Shares (%)			Change (%)
	2008	**2016**	**2017**	**2008**	**2016**	**2017**	**2016-2017**
Total	4,602	3,654	3,725				1.9
15-29	884	471	477	19.2	12.9	12.8	1.3
30+	3,718	3,184	3,249	80.8	87.1	87.2	2.0
Men	2,789	2,118	2,156	60.6	57.9	57.9	1.8
15-29	518	277	276	18.6	13.1	12.8	-0.4
30+	2,271	1,841	1,880	81.4	86.9	87.2	2.2
Women	1,813	1,537	1,569	39.4	42.1	42.1	2.1
15-29	367	193	201	20.2	12.6	12.8	3.8
30+	1,447	1,343	1,368	79.8	87.4	87.2	1.9

Source: Labour Force Survey, ELSTAT, KEPE processing.

volves also part-time schemes. Indeed, the share of new part-time jobs created increased from 11% in period 2015-2016 (1st semester) to 30.7% in period 2016-2017, which still falls short compared to 2014-2015 (40.6%). Thus, one in three jobs created over the past year involves part-time employment, which means lower earnings and uncertainty. Moreover, an increasing share of those employed part-time declares they tried to get a full-time job, but failed. It is a relief, though, that this share has decreased by about 2.5 percentage points over the past year. Nevertheless, it is still too high, standing slightly above 67%. There is no excuse for complacency then.

The employment rates differ also with respect to educational attainment. Approximately eight out of ten Master and/or PhD holders were employed in the first semester of 2017, as well as six out of ten university graduates and upper technical and vocational education graduates. With respect to graduates from lower levels of education, the data are still depressing. Fewer than half of upper secondary graduates, one out of three lower secondary and fewer than one out of six primary education graduates or with fewer years of education were employed. Nevertheless, compared to the first semester of 2016 only the employment rate for upper secondary and lower secondary graduates has increased significantly (more than one percentage point). During the crisis the employment rate decreased the least for Master and/or PhD holders. Similar to the unemployment rates, employment rate differentials across education groups have expanded during the crisis. Therefore, heterogeneity increased during the

crisis, i.e. graduates from some levels of education did much worse than others in terms of employment. Moreover, the recovery of the employment rates over the past year aggravated rather than contained this heterogeneity, contrary to what was observed in the case of unemployment.

The number of the employed increased by 1.9% in the past year (i.e. 70.9 thousand new jobs were created). The biggest increase was recorded amongst Master and/or PhD holders (11.2% or 18 thousand new jobs) followed by upper technical and vocational education (3.8% or 28 thousand new jobs) and AEI graduates (2.5% or 25.6 thousand new jobs). Therefore, it is no surprise that the share of the employed graduates from these specific levels of education has increased, while the share of the employed graduates from the other levels of education has either remained stable or decreased. The increase in the number of graduates from upper levels of education in the first semester of the year is due to reinforced demand, either to substitute for graduates from lower levels of education or due to the genuine need of the labour market for skills and specific characteristics embodied by these graduates. The second scenario is certainly more preferable.

The number of the employed changed over the past year, but the change did not spread equally across regions. In three regions (Epirus, the Ionian Islands and the South Aegean islands) the number of the employed dropped together with the employment rate. Since the first semester in 2016 approximately 10 thousand jobs were lost in the islands and another 2 thousand jobs in Epirus. The number of the employed increased in all

TABLE 3.1.3 Employed by industry (1st semester)

	2016 (thous.)	2017 (thous.)	Change (%)	Share of total change (%)
Agriculture, forestry and fishery	458.3	454.0	-4.3	-6.1
Mining and quarrying	13.5	12.5	-1.05	-1.5
Manufacturing	344.4	354.9	*10.5*	14.8
Electricity, gas, steam and air conditioning supply	28.9	30.8	1.95	2.8
Water supply, sewerage, waste management and remediation activities	22.7	26.5	3.8	5.4
Construction	150.6	148.8	-1.8	-2.5
Wholesale and retail trade, repair of motor vehicles and motorcycles	652.8	672.6	*19.8*	27.9
Transportation and storage	180.7	186.6	*5.85*	8.3
Accommodation and food service activities	327.5	339.4	*11.9*	16.8
Information and communication	78.2	85.3	*7.05*	9.9
Financial and insurance activities	93.4	94.5	1.05	1.5
Real estate activities	6.4	4.3	-2.1	-3.0
Professional, scientific and technical activities	203.3	202.5	-0.8	-1.1
Administrative and support service activities	84.3	88.1	3.85	5.4
Public administration and defence, compulsory social security	329.1	333.7	4.55	6.4
Education	303.2	302.9	-0.3	-0.4
Human health and social work activities	216.2	223.7	*7.5*	10.6
Arts, entertainment and recreation	48.0	53.0	5	7.1
Other service activities	68.6	73.2	4.55	6.4
Activities of households as employers	41.6	37.0	-4.55	-6.4
Activities of extraterritorial organizations and bodies	3.1	1.7	-1.4	-2.0

Source: Labour Force Survey, ELSTAT, KEPE processing.

other regions. The biggest percentage point increases were recorded in Thessaly (3.2%), Crete (2.8%) and West Greece (2.6%). Those same regions also exhibited the biggest increases in the number of the employed. Therefore, out of the 70.9 thousand new jobs created, 27.5% were created in Thessaly, 22.6% in Crete and 21.7% in West Greece. On the other hand, the increase in the number of the employed was weak in Central Macedonia (just 1.15 thousand new jobs) and North Aegean (10.9 thousand new jobs). Overall, in 2017 the employment rate ranged from 35.4% in Epirus to 44.3% in the South Aegean. Moreover, both the spread of the employment rates across regions and the ratio of standard deviation to the arithmetic mean have decreased. This means that regions became more homogeneous compared to the first semester of 2016, luckily following an upward path. Nevertheless, the employment rates are still too low.

The distribution of the employed across industries is interesting. The number of the employed in *Wholesale and retail trade*, the biggest industry in Greece in terms of employment, increased by 19.8 thousand individuals. This is the biggest increase and it represents 27.9% of the total increase in the number of the employed. Therefore, the share of the industry in overall employment increased further to 18.1% in the first semester of 2017 (from 17.9% in 2016). The second biggest increase in the number of the employed was recorded in *Accommodation and food service activities* and equalled 11.9 thousand new jobs, a number that represents 16.8% of total employment increase. This is the fourth biggest employer in the first six months of 2017. Moreover, *Manufacturing* also increased the number of people employed by 10.5 thousand, representing 14.8% of new jobs in total. Lastly, in *Human health and social work activities* 7.5

thousand net new jobs were created, i.e. 10.6% of total new jobs. The number of the employed decreased in the second biggest employer, namely *Agriculture, forestry and fishery*, by 4.3 thousand. Thus the industry is included in the group of seven that exhibit decreases in the number of the employed. Overall, it seems that the biggest industries in Greece managed to increase the number of people employed over the past year, except for agriculture. Nevertheless, it continues to employ more than 12% of total employed and, thus, its course should cause concern, at least with respect to the effective management of people leaving the industry and their smooth transition to other industries. At the same time, the origin of the increase in the number of the employed in *Public administration and defence, compulsory social security*, which is mostly a public sector industry, should be further and carefully investigated.

3.1.4. Paid employment (ERGANI)

Paid employment is typically less widespread in Greece –although still dominant– compared to other EU countries. According to EUROSTAT, in the first quarter of 2017 the share of paid employment in Greece was 20 percentage points lower compared to both EU28 and Eurozone averages (65% vs. 85% approximately). On the other hand, the share of self-employed in Greece is double as high, standing at around 30%. Despite the reduction in the number of employees by approximately 17% during the crisis (first quarter of 2017 is compared to the first quarter of 2008), there was a corresponding reduction in the number of the employed in general. Therefore, there does not seem to be any kind of transformation of employment towards paid employment in the country, since evidence presented in previous issues of the *Greek Economic Outlook* does not exist anymore. It should be noted, though, that the institutional framework in Greece is likely to misinterpret some forms of paid employment and categorise them as self-employment, e.g. being employed under the status of services' provider, but offering these services to a single employer. This means that the number of employees is underestimated in Greece, at least to some extent.

The information system ERGANI documents paid employment flows using data provided by the total of legitimate businesses established in the country. The most recent available data refer to August 2017. August generally exhibits negative net flows, i.e. the number of employees declines. The negative balance of August this year was equal to 14,402 (that is the number of jobs that were destroyed), the second worst performance since 2008 onwards. The worst year was

2016, when 169,128 jobs of paid employment were lost. Except for August, negative net flows were also documented in January 2017. On the other hand, mobility has increased compared to 2016, since more hires and layoffs were recorded.

A better and more reliable view of the evolution of paid employment can be drawn from the eight-month data, i.e. January to August. This becomes even more important in the Greek case where data on employment fluctuate throughout the year due to seasonality and, lately, due to uncertainty. Specifically, in the first eight months of 2017 there were 1.6 million hires and 1.3 million persons left their jobs (either they were laid off or they quit). In total paid employment flows were positive by 250 thousand people, approximately 10 thousand more compared to 2016. That number corresponds to the number of net new jobs created, i.e. jobs created minus jobs destroyed. This is the best performance of the last few years, at least since 2001, for which data exist and are available.

Out of the total number of new jobs created (hires) in the first eight months of 2017, 33.2% were occupied by youth aged 15-24 (over 82 thousand), when the respective share was 31.8% in 2016. Individuals aged 30-44 come second, occupying 27.1% of new jobs. Summing up the numbers for groups 15-24 and 25-29 one gets group 15-29, an extended definition for youth, which is common in Greece. Their share in hires realized in the first eight months of the year reached 47.8%, slightly increased compared to 2016. Youth are overrepresented in hires, a fact which implies that employers prefer them over older individuals. This is proved by the difference between their share in hires and their share in the pool of unemployed. For instance, in the first semester of 2017 youth aged 15-29 represented 11.4% of the total number of unemployed (that should be compared to the 33.2% of new hires in the first eight months), while individuals aged 30-44 represented 41% of the total number of unemployed (but occupied only 27.1% of new jobs of paid employment). Some differences should exist between the two groups anyway. For example, someone over 30 is more likely to start his/her own business or to decide to work as a free lancer. Nevertheless, it is rather difficult to argue that the entire difference can be attributed to such factors.

All industries did not do equally well in the first eight months of the year. *Accommodation services and Food service activities* (treated as different industries) and *Retail trade* dominated hires followed by *Wholesale trade* and the *Food Industry*. The pattern is similar with previous years. It becomes obvious then that the tourism industry is the one absorbing the most unem-

ployed and it is also responsible for the increase in employment in related industries, such as *Retail trade*. On the other hand, though, it is the industry that realises the most layoffs in August. This also partly explains the decrease in the share of full-time job contracts during the summer, since short-term vacancies in tourism businesses are probably filled.

The expansion of flexible types of job contracts continued in 2017. In the first eight months of the year less than half of the new hires involved full-time contacts (756 thousand or 47.6%), while 38.4% involved part-time contracts and the rest involved work-in-shifts contracts. April and May were the only months when full-time jobs exceeded half of the new hires, while in February and June the lowest shares were documented, close to 43%. Compared to 2016 the shares do not diverge significantly and their distribution across months has remained almost unchanged. This means that the labour market has formed a specific pattern for paid employment. It lies on the government then to decide whether this pattern is satisfactory or not and whether certain interventions are required to change it.

The number of conversions of full-time contracts to part-time and work-in-shifts contracts with or without the consent of the employee increased slightly compared to the first eight months of 2016 (833 more cases). The picture is certainly much better compared to 2015, when 56,125 such conversions were documented, but it is still far from ideal, especially with respect to conversions without the consent of the employee. Ideally, there should be no conversions without the consent of the employee. On the contrary, on an annual basis the number of these conversions increased by 124 incidents. As a share of the total number of conversions, though, the conversions without the consent of the employee are at the same level with 2016 (approximately 14.5%) and considerably lower compared to 2015 (53.1%).

3.1.5. Labour force participation

The labour force participation rate remained almost unchanged during the crisis. In the first semester of 2017 this picture did not change, since the participation rate for the general population (aged 15+) increased only marginally from 52.1% to 52.2%. This increase corresponds to 17 thousand fewer economically active individuals in the first six months of 2017 compared to 2016. This paradox can be easily explained once one considers that during the same period the population (i.e. the denominator of the index) decreased by approximately 36 thousand persons. The reduction in

the size of the population can be attributed to various factors, emigration included. Moreover, almost six out of ten men are economically active in 2017, when the respective index for women is 44.9%, i.e. 15 percentage points lower, which is common in other European countries too (although the difference is usually not that wide). In the first semester of 2017 (most recent available data) the average participation rate for the EU28 was 64% for men and 51.5% for women. Note that the difference between Greece and the EU28 is slightly wider in the case of women.

Nevertheless, a stable participation rate does not mean that there are no movements across population groups, defined by gender or age. Therefore, a careful look at the data reveals that the reduction in the labour force compared to 2016 was due mainly to women whose number declined by 12 thousand, i.e. approximately 2/3 of the overall decrease. The number of labour market participants has increased for all age groups except for group 25-29 (34.2 thousand) and group 30-44 (46.8 thousand). Combining data for gender and age shows that women aged 30-44 have had the biggest decrease (37.7 thousand) followed by men aged 25-29 (22.8 thousand). A more thorough look reveals further that the reduction in the labour force of men is more widespread across age groups. On the contrary, the number of participants aged 45-64 increased, irrespective of gender (49.1 thousand). Based on these data there does not seem to be any support for the argument that some members of the labour force are discouraged by the high unemployment rate and drop out. It seems more probable that the motive to support one's household income impacts stronger on the decision to participate or not in the labour force.

The labour force participation rate is almost a linear positive function of the level of education. It is no surprise that 90% of Master and/or PhD holders participate in the labour force. Moreover, 80% of upper technical and vocational education graduates followed by 70% of university (AEI) graduates are either employed or actively looking for a job. Primary education graduates and those with fewer years of education are the least likely to participate. Essentially, the labour force participation rate did not change for any group of graduates over the past year. Nevertheless, important differences are documented in the net result (inflows-outflows) by educational group. On an annual basis Master and/or PhD holder participants increased more compared to all other graduate groups (9.9% or 17.9 thousand persons), followed by upper technical and vocational education graduates (2.2% or 21.2 thousand persons) and university graduates (1.7% or 14.7 thousand persons). The number of participating graduates from the

rest of the education levels decreased, in some cases considerably so (e.g. primary education graduates or less education: 9.2% or 54.1 thousand persons). Therefore, it seems that on an annual basis the presence of highly educated people in the labour force was strengthened.

Labour force participation differs across regions too. In particular, the reduction in the number of labour force participants (approximately 17 thousand) came primarily from two regions: Attica, where 15.5 thousand persons left the labour force in the first semester of the year, and Central Macedonia, where approximately 11 thousand persons seem to have also left the labour force. On the other hand, the North Aegean islands and Thessaly saw their labour force increase by 7.6 thousand and 6.2 thousand individuals, respectively. These fluctuations might be the outcome of various factors at play, which cannot be analysed using the available data alone. Finally, note that the participation rate in the first six months of 2017 ranged from 47.7% in Epirus to 54.9% in the South Aegean islands and Crete, but the heterogeneity between regions seems to shrink over time.

3.1.6. Wages

Paid employees' compensation, i.e. wages, is estimated to have increased in 2016 compared to 2015 by 0.8%, while in 2017 compared to 2016 an increase of 1.5% is anticipated (EC, 2017[3]). If that proves to be the case, then 2017 will be the second consecutive year in which nominal wages for employees increase. Unsurprisingly, the increase is much smaller in real terms (based on GDP): 0.7% in 2016 and 0.3% in 2017. Note though that the rate of change of wages was negative in the previous years, starting in 2010, while the biggest decrease was reported in 2013 (compared to 2012). Consequently, the share of wages on GDP declined from 60% in 2011 to 56.3% in 2013; recall that GDP has fallen considerably over the years, while it increased marginally in 2016 to 58.5%. Moreover, the unit labour cost has been falling since 2010 and reached its minimum value in 2015 (85.9). Since then it increased by 1.8 points in 2016, while it is expected to rise further in 2017 (88.5). Nevertheless, it will remain more than 10 points smaller compared to 2010. Note that the real unit labour cost is somewhat bigger due to inflation.

On the other hand, the wage index published by ELSTAT dropped in the first quarter of 2017 by 17.1% and increased in the second quarter by 10.7% (compared to respective previous quarter). On a year on year basis, the wage index increased in both quarters. Even if seasonality and days worked are taken under consideration, the changes of the wage index have the same sign, but volatility is reduced due to the subtraction of one factor of change at a time. Note that the wage index always drops in the first quarter of the year, due to the Christmas bonus paid in December. To avoid bias, one should refer to annual changes. Starting in 2008 an increase in the wage index is documented in the third quarter of 2014. Since then the index fell only in the second quarter of 2015 and in the fourth quarter of 2016. Nevertheless, these two drops (especially the first one) are big enough to compensate for any increases in the index in the meantime. As a result, the wage index in the second quarter of 2017 has almost the same value with that of the second quarter of 2014. Therefore, it seems that wages have remained stable over the past two years, despite the increase in the number of the employed. This could be easily interpreted by the type of new employment involved (i.e. flexible), which entails lower wages, and the willingness of a large number of unemployed to work for the (low) wages offered, which will most likely continue as long as the unemployment rate stays high enough.

3.1.7. Conclusions

Developments in the labour market leave no room for exultation. The unemployment rate continues to drop and the employment rate continues to rise. Nevertheless, they are a lot of grey areas, starting with the size of the unemployment rate, which is still over 20%, and the size of the employment rate, which is close to 40%. A second issue involves the low rates of change. Although the situation seems to be improving, it does so at a very slow pace. A third issue that causes concern is the type and quality of new jobs. The expansion of flexible types of employment leads to new jobs that may not be sustainable and they most likely cannot guarantee a decent living.

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3. European Commission (2017). *Statistical Annex of European Economy*, Spring 2017, Economic and Financial Affairs. Available at: <https://ec.europa.eu/info/files/statistical-annex-european-economy-spring-2017_en>.

3.2. Material deprivation: Recent developments and characteristics

Nikolaos C. Kanellopoulos

3.2.1. Introduction

Measuring the level and characteristics of well-being at either the individual or the family level is a particularly useful field of economics, as it can identify population groups that face problems and their severity and in that way help policy designers to deal with them more effectively. In this respect, the most common ways to approach prosperity is to measure income poverty, social exclusion and the degree of income inequality in an economy.[1] In addition to the aforementioned, another welfare measure, also adopted by the European Union, is the degree of material deprivation. This measures the inability of a person to have, not because of choice but due to economic difficulties, certain goods and services that are generally considered to be indispensable for a decent standard of living. In particular, the percentage of people experiencing (severe) material deprivation is used, i.e. those who cannot acquire at least (four) three basic goods and services from a specific list of nine items.[2] This section presents some basic characteristics of (serious) material deprivation, as well as its evolution over time and a descriptive approach to its relation to poverty in Greece.

The widely accepted and reliable source of statistical data to measure the living conditions of households at the national and the European level is the Survey of Income and Living Conditions (EU-SILC). The survey is conducted annually by ELSTAT, co-ordinated by Eurostat, and offers comparable data on income distribution and composition, social exclusion, and material deprivation for 32 European countries and Turkey, as well as information on demographic characteristics of people, their status in the labour market, etc. Recent EU-SILC data up to the latest available, i.e. 2016 (EU-SILC 2016), which were published in the summer of 2017 and refer to 2015 income, will be used. However,

for material deprivation indicators, the reference year is the year of the survey, in this case 2016.

3.2.2. International comparisons

As mentioned, for the measurement of severe material deprivation, the percentage of people who cannot afford four basic goods/services for financial reasons is used. This percentage for the years 2005 and 2016, as well as social expenditures as a percentage of GDP and per capita for 2014, are presented for different EU countries in Figure 3.2.1. Greece in 2016 records the third highest rate of material deprivation in the European Union (22.4%), following Bulgaria (31.9%) and Romania (23.8%), and followed by Hungary (16.2%). On the other hand, the countries with the lowest rate of material deprivation are Denmark and the Netherlands (2.6%), Finland (2.2%), Luxembourg (2%) and Sweden (with an impressive 0.8%).

The percentage of people with severe material deprivation in Greece recorded an increase between 2005 and 2016, which is 9.6 percentage points (pp), followed by Italy with 5.1pp. An increase is also recorded by other countries under an economic adjustment program. In particular, Ireland (2.4pp), Spain (1.7pp) and Cyprus (1.5pp), while Portugal shows a marginal decrease (-0.9pp). With the exception of Slovenia and the Netherlands, where there is a slight increase, although both are very low in the ranking, the rest of the countries during the period under review have reduced their percentage of people living in severe material deprivation. The decreases recorded in Poland (-27pp), Latvia (-26.5pp) and Lithuania (-19pp) are impressive. Finally, the practical disappearance of material deprivation in Sweden is remarkable, as from the low level of 2.3% in 2005 it fell to a negligible 0.8% in 2016.

Both the level of severe material deprivation and its change over time are expected to be related to the social expenditure of each country. Figure 3.2.1 shows social spending as a percentage of the GDP of each country. The dotted horizontal orange line is the level of social spending in Greece (26% of GDP). It is striking that out of the 25 countries recording smaller severe material deprivation than Greece, 14 spend a lower percentage of their GDP on social policies. This

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1. Kanellopoulos, N.C. (2016) 'Recent developments in income inequality and distribution', *Greek Economic Outlook*, Issue No 29, pages 31-35 and Kanellopoulos, N.C. (2015) 'Recent developments in poverty and social exclusion', *Greek Economic Outlook*, Issue No 26, pages 33-34.

2. This list, which is common for all EU countries, includes the financial inability to: 1) Face unexpected expenses, 2) Afford a one-week annual holiday away from home, 3) Pay for arrears (mortgage or rent, utility bills, etc.), 4) Afford a meal with meat, chicken or fish every second day, 5) Keep home adequately warm, 6) Have a washing machine, 7) Have a colour TV, 8) Have a telephone, 9) Have a personal car.

Percentage of population with severe material deprivation in European countries and expenditure on social protection

Severe material deprivation rate, 2005
Severe material deprivation rate, 2016
Social expenditure % GDP, 2014
Social expenditure per capita (right axis)
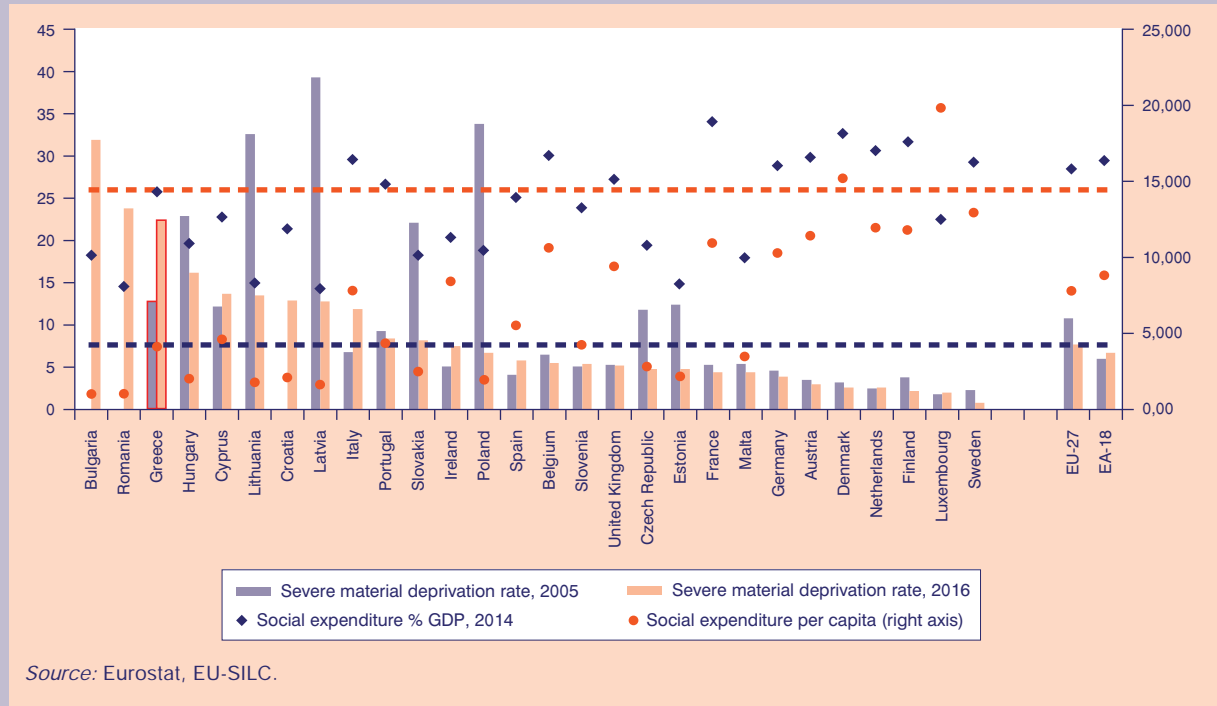
Source: Eurostat, EU-SILC.

rate for 2014, although seemingly high, may be considered "fictitious" since Greece's GDP in the years of the crisis has dropped significantly. Another way of approaching social spending is to express it as per capita. In this case, out of the 25 countries with smaller severe material deprivation than Greece, 9 spend less than Greece on social policies per capita. Moreover, in 2005, before the onset of the economic crisis, Greece was ranked sixth in terms of the rate of serious material deprivation. It therefore appears that, systematically, countries that spend less on social protection than Greece are performing much better at the levels of material deprivation. In this regard, the problem of dealing with severe material deprivation is not only the level of social spending but also its very low effectiveness.

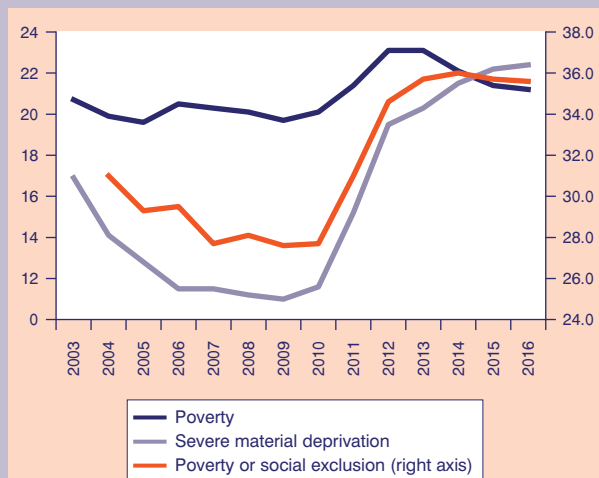### 3.2.3. Severe material deprivation and poverty

Figure 3.2.2 shows the evolution over time of severe material deprivation, the poverty rate and the percentage of the poor or socially excluded in Greece. It is characteristic that poverty, which measures in relative terms the lack of income, remains relatively stable, registering a slight increase after 2010. On the other

hand, severe material deprivation, which measures the lack of specific goods/services that remain the same over time, declined steadily by 6pp from 2003 to 2009, indicating an improvement in the level of prosperity, and from 2009 to 2016 it has continuously increased by 11.4pp as a result of the economic crisis. The depth of deprivation is further strengthened, given that during the period in which it increases, prices are falling, making some of the goods and services used to measure it cheaper in nominal terms than before. The high tax burden has contributed to the widening of material deprivation, which in 2016 increased more than one percentage point as a result of increased direct and indirect taxes and insurance deductions.[3]

From the definition of severe material deprivation, it is clear that people who face severe material deprivation and those who are poor are not necessarily the same. People who are poor may have a decent standard of living, while households that are at higher income levels due to increased or unexpected obligations may not be able to acquire at least four basic goods and services, even if they want to. It is therefore useful to know, beyond the scale of serious material deprivation, its correlation with poverty, since reducing one does not necessarily mean reducing the other.

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3. OECD (2017), *Tax Policy Reforms 2017: OECD and Selected Partner Economies,* OECD Publishing, Paris.

Trends in Material Deprivation, Poverty and Social Exclusion, 2003-2016

Source: Eurostat, EU-SILC.

Table 3.2.1 shows the evolution of four population groups over the course of time: Those who are neither poor nor facing severe material deprivation, those who are only poor, those experiencing only severe material deprivation, and those who are poor and at the same time face serious material deprivation. The percentage of people who are neither poor nor experiencing severe material deprivation progressively rose before the crisis, from 70% in 2003 to 75.4% in 2010. It then receded and appears to be stabilizing at a marginally lower level than in 2003. The evolution of the percentage of people registered as only poor is interesting and varies between 8.2% and 14.7%. What is impressive with this indicator is that until 2006 it rose marginally, and since then, even during the crisis, it has constantly decreased. The opposite is the case for those facing severe material deprivation, who have been a smaller and shrinking part of the population than the only poor, but have been converging in recent years. In particular, from 9.2% in 2003 they gradually decreased to 4.5% in 2010 and then increased to 9.4% in 2016. The last population group, which is in the most difficult position since it faces both income poverty and serious material deprivation, ranges from 5.8% to 13%, whereas since 2006, i.e. before the onset of the current economic crisis, it has been continuously growing as a part of the total population. It is worth mentioning that while in 2003 this group was the smallest in comparison to the others who were facing a problem, in 2016 it has become the biggest and with a marked difference.

There seems to be a relation between poverty and material deprivation. However, measuring welfare only

TABLE 3.2.1 Evolution of severe material deprivation and poverty, 2003-2016

	Non income poor & non deprived	Income poor only	Deprived only	Both income poor & deprived	Total
2003	70.2	13.0	9.2	7.7	100
2004	72.1	13.8	8.0	6.1	100
2005	73.3	13.8	7.1	5.8	100
2006	73.8	14.7	5.7	5.8	100
2007	74.9	13.7	4.9	6.6	100
2008	75.0	13.8	4.8	6.3	100
2009	75.3	13.7	4.9	6.1	100
2010	75.4	13.0	4.5	7.1	100
2011	72.5	12.4	6.1	9.1	100
2012	69.2	11.3	7.7	11.8	100
2013	68.9	10.8	8.0	12.4	100
2014	69.2	9.3	8.8	12.8	100
2015	69.1	8.7	9.5	12.6	100
2016	69.3	8.2	9.4	13.0	100

Source: Eurostat, EU-SILC.

FIGURE 3.2.3

Percentage of people with severe physical deprivation per income quintile
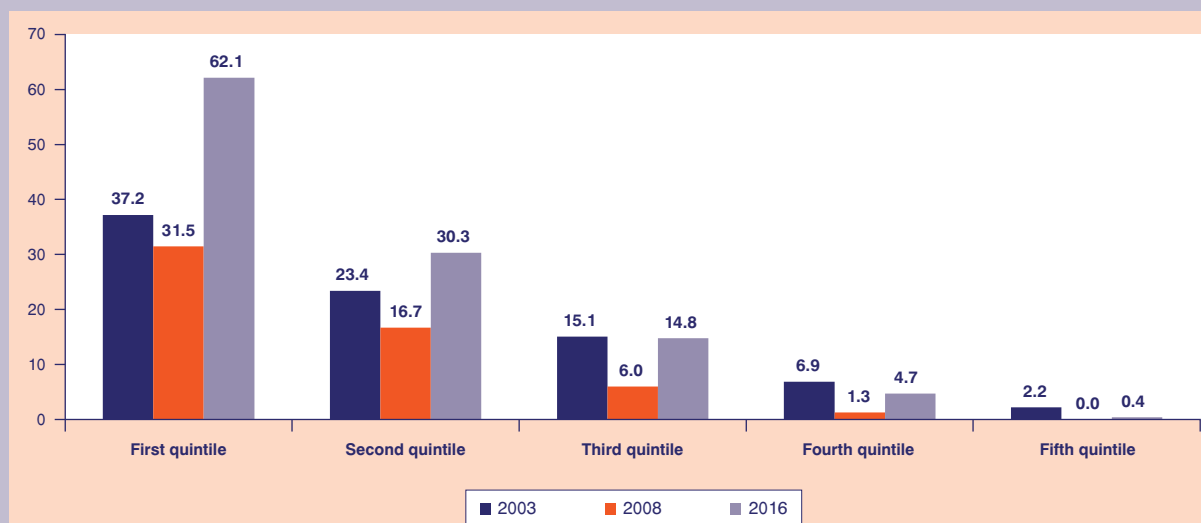
Source: Eurostat, EU-SILC.

from the income point of view is not an effective practice, as it ignores about 9% of people experiencing only severe material deprivation. Of course, the opposite is also the case, since an analysis of only those who have living condition problems means that 8% of those who are only poor are ignored. In this regard, both the problem of poverty and the one of serious material deprivation should be considered together.

The fact that a sizeable part of those who suffer from severe material deprivation is not limited to the poor also is the case if their dispersion in income distribution is examined (Figure 3.2.3). At first, there are people experiencing severe material deprivation problems even in the highest quintile of the distribution, although they are very few. As expected, the majority is found in the lower quintiles and, above all, in the first two, which also record an increase. In particular, in the lowest 20% of the population in 2016, 62% had severe living problems (2003: 37.2%, 2008: 31.5%), while the corresponding share for the second quintile is 30% and for the third 14.8%. Finally, it is worth noting that in less than a decade, between 2008 and 2016, the percentage of those facing severe material deprivation increased more than double in all quintiles, indicating that it is not only low income that causes material deprivation, but also high arrears (loans), as well as greater participation in services

previously offered cheaper by the state (health, medicines, etc.). Thus, a welfare analysis limited only to the poor and ignoring those who have problems of living, leaves out a sizeable part of the population facing serious problems.

3.2.4. Characteristics of severe material deprivation

Figure 3.2.4 illustrates the evolution over time of severe material deprivation for the whole population and for selected population groups for years 2003-2016. All population groups at the beginning of the period under review recorded material deprivation rates well above the national level, in other words, they were high-risk groups. However, in 2016 only the elderly over 65 and the pensioners recorded rates significantly lower than the national average, while it appears that the percentage of people with severe material deprivation in these population groups has dropped dramatically by almost half (for those above 65 from 26.9% in 2003 to 15.2% in 2016, while for those retired from 24.9% in 2003 to 14.4% in 2016).[4] These population groups, despite significant reductions in their disposable income, generally retain some guaranteed income from pensions, as opposed to the unemployed, which offers them a decent standard of living.

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4. The reduced proportion of elderly and retired people between 2003 and 2016 who face severe material deprivation is likely due to the fact that on average people who retired during the period under review received pensions higher than older people, who due to death are not taken into account in the 2016 calculations. Moreover, the more recent retirees have higher savings and fewer medical needs.

FIGURE 3.2.4
Diachronic evolution of the severe material deprivation rate for individual population groups, 2003-2016

Source: Eurostat, EU-SILC.
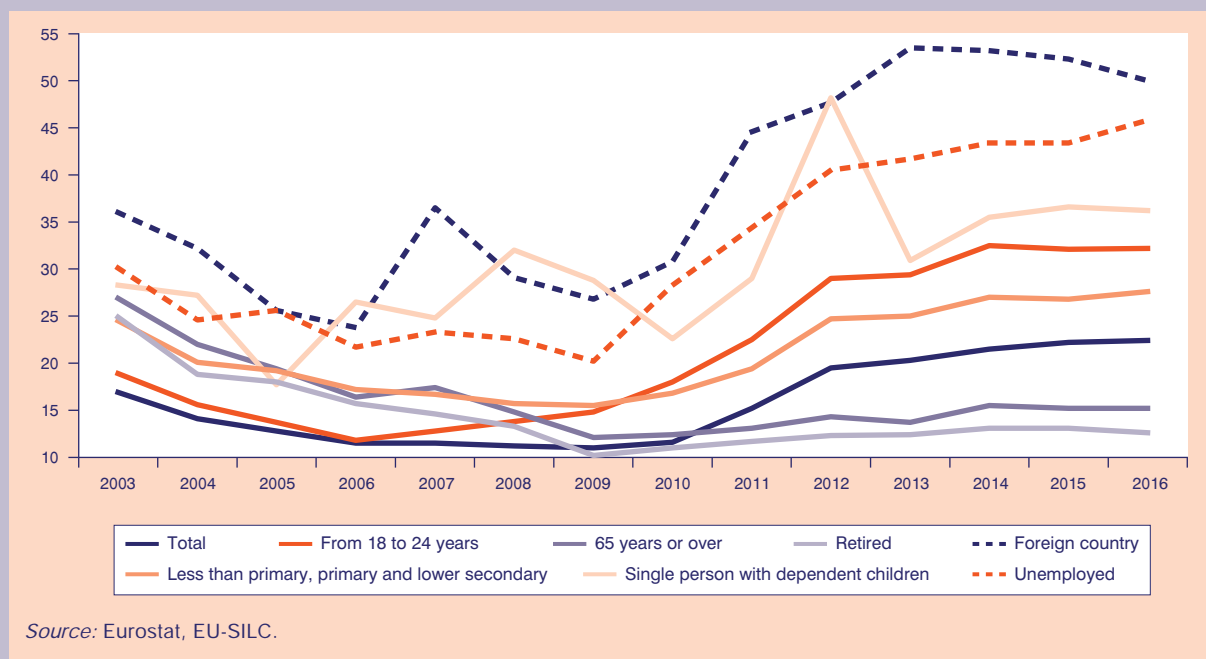
Most frequent activity status

The ability of individuals to access the goods and services that are considered necessary for a dignified life is closely related to their income and thus their employment status. Indicatively, one in two unemployed individuals faces a problem of severe material deprivation, three times higher compared to those who work. It is therefore reasonable to expect that improving the economic environment and boosting employment will positively contribute to overall prosperity by significantly reducing the number of people with severe deprivation. Even more impressive is the progress registered by pensioners, reducing almost half the proportion of vulnerable people, while the unemployed with material deprivation increased by 52%. It is therefore clear that any social protection nets available are exhausted in the payment of pensions, thus excluding large population groups. Low unemployment benefits and non-existing unemployment protection for those who have not worked or who do not meet specific standards bring about half (45.8%) of unemployed people to severe material deprivation.

Age, gender and level of education

Although diachronically women experience the probability of material deprivation above the national average and were marginally more exposed than men (18% for

women *vs.* 15.8 for men in 2003), in the recent years there is not a systematic gender difference (22.6% for women and 22.2% for males in 2016). However, it appears that younger ages record higher rates of material deprivation, especially between 18 and 24 years old. It is also indicative that in all age groups the percentage of people with material deprivation is clearly growing, with the exception of those over 65 where it declined until 2009 and has since shown signs of stabilization. This is probably linked to the fact that this category typically includes retirees, who, as mentioned above, absorb a significant part of social spending in the form of pensions, thus maintaining a decent standard of living.

As expected, the higher the level of education, the lower the percentage of people with material deprivation. In particular, in 2016 the proportion of people experiencing severe material deprivation for higher education graduates is estimated at 9.6% (2003: 4.9% and 2009: 3%), for secondary school graduates at 23.1% (2003: 12,1% and 2009: 8.9%) and for those with a lower level of education at 27.6% (2003: 24.5% and 2009: 15.5%). These striking differences are certainly related to the likelihood of work, which is higher for people with more qualifications, as well as higher wages.

Household composition and tenure status

The displacement of severe material deprivation from the elderly to the youngest arises, even if the composition

TABLE 3.2.2 Serious material deprivation in selected groups, 2003 and 2016

				Change	
	2003*	2016*	Absolute	%	Average annual
Total	16.9	22.4	5.5	32.5%	2.0%
Most frequent activity status					
Employed	12.2	15.5	3.3	27.0%	1.7%
Not employed	*23.0*	**25.2**	2.2	9.6%	0.7%
Other inactive	**20.1**	**27.1**	7.0	34.8%	2.2%
Retired	**24.9**	12.6	-12.3	-49.4%	-4.7%
Unemployed	**30.1**	**45.8**	15.7	52.2%	3.0%
Gender					
Female	**18.0**	**22.6**	4.6	25.6%	1.6%
Male	15.8	22.2	6.4	40.5%	2.5%
Age					
Less than 18 years	12.6	**26.7**	14.1	111.9%	5.5%
From 18 to 24 years	**18.9**	**32.2**	13.3	70.4%	3.9%
From 25 to 49 years	13.8	**23.7**	9.9	71.7%	3.9%
From 50 to 64 years	16.9	20.9	4.0	23.7%	1.5%
65 years or over	**26.9**	15.2	-11.7	-43.5%	-4.0%
Level of education					
Less than primary, primary and lower secondary	**24.5**	**27.6**	3.1	12.7%	0.9%
Upper secondary and post-secondary	12.1	**23.1**	11.0	90.9%	4.7%
Tertiary	4.9	9.6	4.7	95.9%	4.9%
Household composition					
Households with dependent children	13.0	**26.1**	13.1	100.8%	5.1%
Households without dependent children	**21.0**	19.1	-1.9	-9.0%	-0.7%
One adult 65 years or over	**39.1**	16.9	-22.2	-56.8%	-5.8%
Single person with dependent children	**28.3**	**36.2**	7.9	27.9%	1.8%
Two adults with three or more dependent children	16.9	**34.3**	17.4	103.0%	5.2%
Two adults, at least one aged 65 years or over	**25.6**	12.8	-12.8	-50.0%	-4.8%
Two or more adults with dependent children	12.6	**25.7**	13.1	104.0%	5.2%
Tenure status					
Owner, no outstanding mortgage or housing loan	14.5	18.7	4.2	29.0%	1.8%
Tenant, rent at market price	**25.5**	**31.4**	5.9	23.1%	1.5%
Tenant, rent at reduced price or free	**20.8**	**27.7**	6.9	33.2%	2.1%
Nationality					
Foreign country	**36.0**	**50.0**	14.0	38.9%	2.4%
Reporting country	**17.0**	19.7	2.7	15.9%	1.1%
Degree of urbanization					
Cities	15.5	21.6	6.1	39.4%	2.4%
Rural areas	**19.7**	**23.9**	4.2	21.3%	1.4%
Towns and suburbs	11.1	21.8	10.7	96.4%	4.9%

Source: Eurostat, EU-SILC.

Note: * Bold font indicates percentage of serious material deprivation higher than the corresponding national.

of households is examined, where households with children and no older people appear to have a higher probability of material deprivation. As shown in Table 3.2.2, households with children, and in particular single-parent households with children, face severe material deprivation problems, with their percentage doubling between 2003 and 2016. We see, therefore, that the problem of childhood material deprivation is deteriorating rapidly. Immediate treatment is very important since severe material deprivation has serious long-term consequences for the economic and professional situation of people, their health status, etc.

Also, households living in a rented property record higher material deprivation over those who reside in owned homes. However, for the latter, especially those with a mortgage, there is a dramatic increase (2007: 5.9%, 2016: 22.8%), indicating that bank liabilities increase the probability of deprivation, which is now less inherent with wealth.

Degree of urbanity and nationality

Material deprivation does not seem to differ depending on the degree of urbanity, although in 2003 the differences were clearly greater. Finally, material deprivation is associated with nationality, since in 2016 half of those with a foreign citizenship faced serious problems of material deprivation.

3.2.5. Conclusions

Summing up, Greece, even before the economic crisis, was among the high materially deprived European countries. Its relative position has worsened in recent years, both because the percentage of people with material deprivation in Greece has increased, and because in other countries the corresponding percentage has fallen. However, it appears that although the welfare state spends a significant percentage of GDP, it is unable to meet the increased needs for social protection due to the crisis. Thus, very high levels of deprivation are recorded, much higher than in other European countries, with similar or smaller resource allocation.

The analysis of the data shows a clear shift of deprivation from the elderly and the retired to the youngest and especially the unemployed, who record the second highest rate of severe material deprivation in Greece after immigrants. Finally, households with children are affected by deprivation.

All the above suggest the immediate implementation of policies to protect the most affected socio-economic groups. In this respect and since the unemployed appear to be more affected, employment-friendly policies will have a positive impact. In particular, policies encouraging hiring –whether these are substantial structural reforms in market liberalization or expanding the active employment policies already in place, or investments to create new jobs– may be the catalyst for reducing unemployment, improving prosperity indicators and restoring the fragile social cohesion. Given that the problem of material deprivation is not limited to low-income households, selective reduction in tax burdens as well as policies to reduce and solve the problem of non-performing loans would help reduce it and increase economic activity in a variety of ways. Finally, the full implementation of social solidarity income with its complementary actions for the reintegration of the unemployed into employment, as well as better targeting of social benefits, is expected to contribute positively.

4.1. Overview of the basic energy and environmental indices of the Greek economy

Vassilis Lychnaras

4.1.1. Introduction

In previous works, we presented the evolution of the main parameters of the energy sector in Greece. However, it is interesting to study the basic energy and environmental indices that also reflect the Greek economy. In order to present a more general picture of the key figures of these fields in our country, this article records and analyses the evolution of these indices. At the same time, the analysis compares Greek indices with the EU average, in order to draw conclusions for the status of our country in the EU. The Eurostat database has been used to collect all the data, and more detailed information about the characteristics of each index is available from the Eurostat definitions.

4.1.1. Energy intensity of the economy

An interesting parameter that connects the energy consumption of the country and its economy is the *Energy intensity of the economy*.[1] This index is esti-

mated as the ratio between the gross inland consumption of energy and the gross domestic product (GDP) of the country and is measured in units of kg of oil equivalent per 1000 EUR. Despite the fact that the index reflects purely economic terms, it gives a clear picture of the energy needs of an economy in relation to its economic potential. Annual data are available until 2015 and from Figure 4.1.1 we can see that, up to 2010, Greece's economy shows lower energy intensity compared to the average of the EU countries. On the other hand, during the latest five years, the Greek energy intensity increased much more and exceeded the EU average. However, it seems that this result occurred mainly because of the reduction of the country's GDP and, secondly, due to the increase in energy consumption.

4.1.2. Energy and environmental taxes

Another essential parameter for the economic development of the country is the taxation of energy. The index that estimates the *Implicit tax rate on energy*[2] is recorded in EUR/TOE (tonne of oil equivalent) and is defined as the ratio between energy tax revenues, measured in euro (deflated), and final energy consumption, as TOE. As before, the Eurostat data were available up to 2015 and as seen in Figure 4.1.2, in recent years there has been a significant increase of the implicit tax rate in our country. This is clearer if someone compares the index with the EU average. We can say that this remark

FIGURE 4.1.1
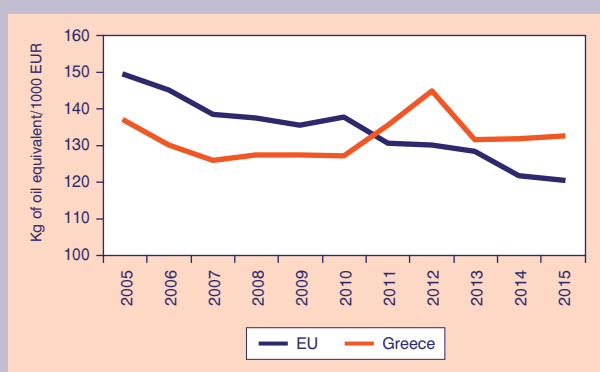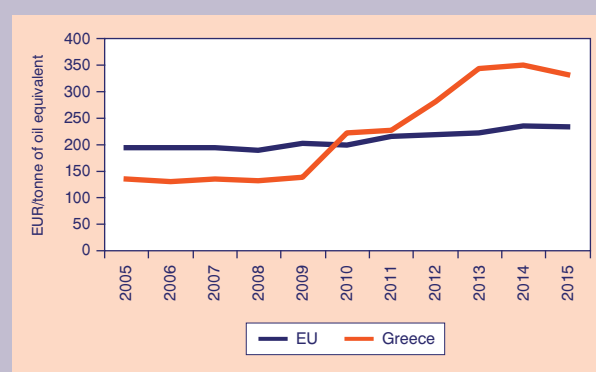**Energy intensity of the economy**

FIGURE 4.1.2
Implicit tax rate on energy

1. <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdec360>.

2. <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdcc360>.

confirms, to some extent, the debate of recent years that the rise of energy costs in Greece might be due to the increasing burden of taxation. Additionally, the significant increase of the total annual revenue from energy taxes,[3] as presented in Figure 4.1.3,[4] confirms the importance of the increased taxation after 2009.

Another parameter related to taxation is the *Environmental tax revenues*,[5] which is recorded by Eurostat as the share of environmental taxes on total tax revenue (Figure 4.1.4). So, it somehow shows the importance of taxes related to the environment in the State's tax revenue. Like energy taxes, after 2009, there was also a significant increase in environmental tax revenues. We see that, until 2009, the share of environmental taxes in Greece was about 6%, similar to the EU average, but afterwards, this share increased significantly, reaching about 10% of total taxes.

4.1.3. RES and greenhouse gas emissions

In this sector, a typical environmental index is the one that records the *Greenhouse gas emissions per capita*,[6] in tonnes of CO_2 equivalent per capita. From this index, one can see the trend of greenhouse gas emissions, as defined in the Kyoto Protocol, in relation to the population of the country. As seen from Figure 4.1.5, the level of emissions in Greece is and remains higher than the average of the EU member states. However, it is important to note that the downward trend of the index in Greece is faster than the EU trend. As a result, the Greek index tends to reach the European average.

In this category, there is also an index that is specifically focused on the emissions from energy. More particularly, the index of the *Greenhouse gas emissions intensity of energy consumption*[7] is estimated
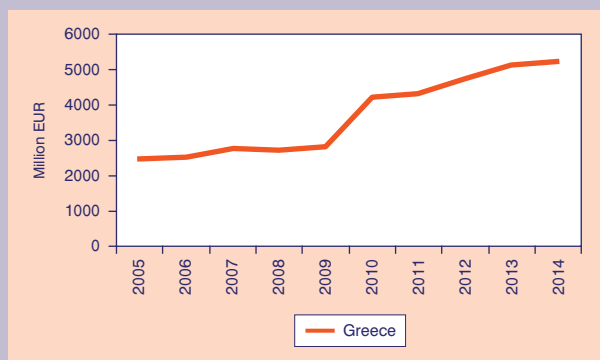
FIGURE 4.1.3
Total revenue from energy taxes

FIGURE 4.1.5
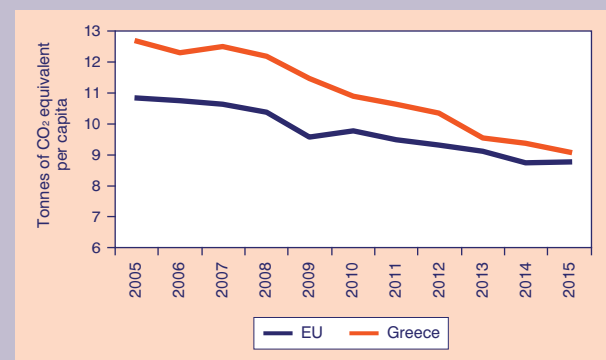### Greenhouse gas emissions per capita

FIGURE 4.1.4
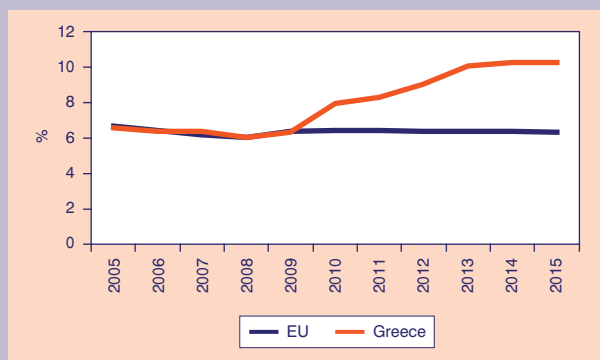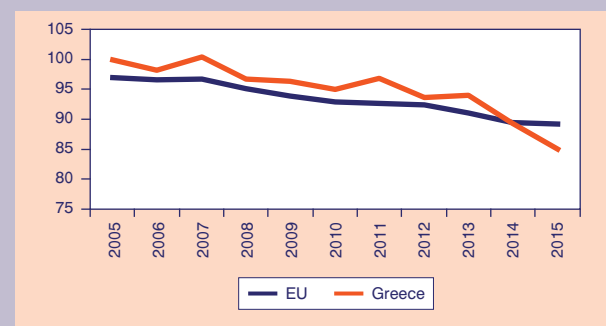### Environmental tax revenues

FIGURE 4.1.6
Greenhouse gas emissions intensity of energy consumption

3. <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=t2020_rt300>.
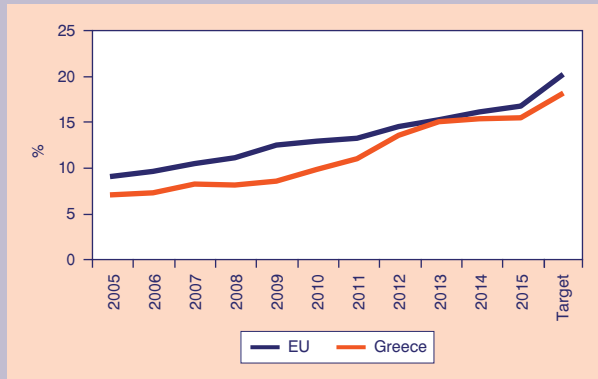
4. The data from Eurostat are available up to 2014.

5. <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=t2020_rt320>.

6. <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=t2020_rd300>.

7. <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdcc220>.

FIGURE 4.1.7

Share of renewable energy in gross final energy consumption

FIGURE 4.1.8

Recycling rate of municipal waste
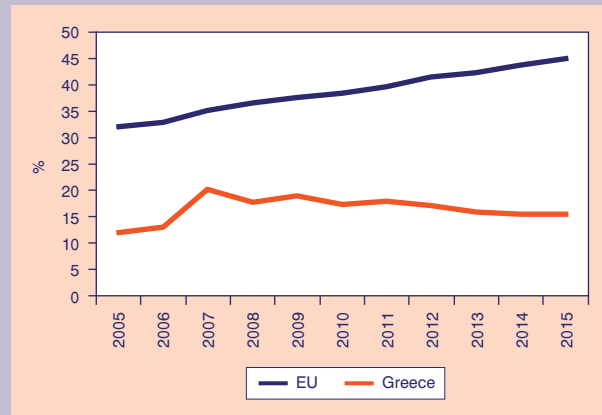
FIGURE 4.1.9

Recycling rate for packaging waste

as the ratio between energy-related greenhouse gas emissions (carbon dioxide, methane and nitrous oxide) and gross inland energy consumption. The base year of the index is 2000 (2000 = 100). In Figure 4.1.6 above we observe the constant decline of the parameter in Greece. Although it is not visible from the graph, the downward trend started before 2000. It is also very important that in 2015 the Greek index fell below the EU28 average.

Another index, the *Share of renewable energy in gross final energy consumption*[8] is a parameter directly connected to the EU member-states' obligations that arise from Directive 2009/28/EC on the promotion of the use of energy from renewable sources. We can see from Figure 4.1.7 that our country is below the EU average, but it systematically follows the upward trend of the EU. The figure also presents the RES targets for 2020, according to the above directive. The specific targets are 20% for Europe and 18% for Greece.

4.1.4. Recycling

In the field of recycling, Eurostat records some important figures, three of which are presented below. The first concerns the *Recycling rate of municipal waste.*[9] This parameter is estimated as the share of the tonnage recycled from municipal waste divided by the total municipal waste arising. The index is presented in Figure 4.1.8 and as we see, the recycling rate in our country remains at a very low level compared to the

average of EU countries. Note that while the recycling rate in the EU is rising and reached 45% in 2015, in our country, after 2007, the rate decreased from 20% to about 15%.

The other two indices are focused on the treatment of packaging waste. The first one is the *Recycling rate for packaging waste,*[10] as defined in Article 6(1) of Directive 94/62/EC. The index is estimated as the total quantity of recycled packaging waste divided by the total quantity of generated packaging and is presented in Figure 4.1.9. The second index is the *Recovery rates for packaging waste.*[11] This index is presented in Figure 4.1.10 and it is calculated as the ratio of

8. <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=t2020_31>.
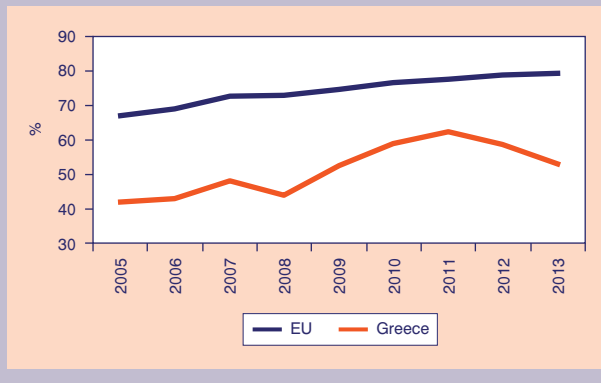
9. <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=t2020_rt120>.

10. <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=ten00063>.

11. <http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=ten00062>.

FIGURE 4.1.10
Recovery rates for packaging waste

packaging waste. Unfortunately, the currently available data for our country only cover the period up to 2013. It is clear from the figures that both indices in our country are lower than the EU average. Additionally, the performance of Greece in recycling, as well as in recovery and utilization of packaging waste, decreased after 2011.

4.1.5. Brief conclusions

A main conclusion arising from the indices presented above is that, in most of the categories, Greece is in a worse position compared to the EU average. However, it is positive that in many cases our country follows a positive trend. On the other hand, unfortunately, there are also cases where the indices are worsening in Greece. More specifically, our country shows negative trends on the parameters concerning energy and environmental taxes, as well as recycling.

the total quantity of packaging waste recovered or incinerated at waste incineration plants with energy recovery, for the purposes of Article 6(1) of Directive 94/62/EC, divided by the total quantity of generated

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

Georgia Skintzi

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

4.2.1 Industrial production indices

Figure 4.2.1 illustrates the industrial production index[1] and the manufacturing index,[2] as well as the percentage changes of both indices for the period 2000-2016. The negative effects of the economic crisis on industrial production became apparent in 2008 when both indices start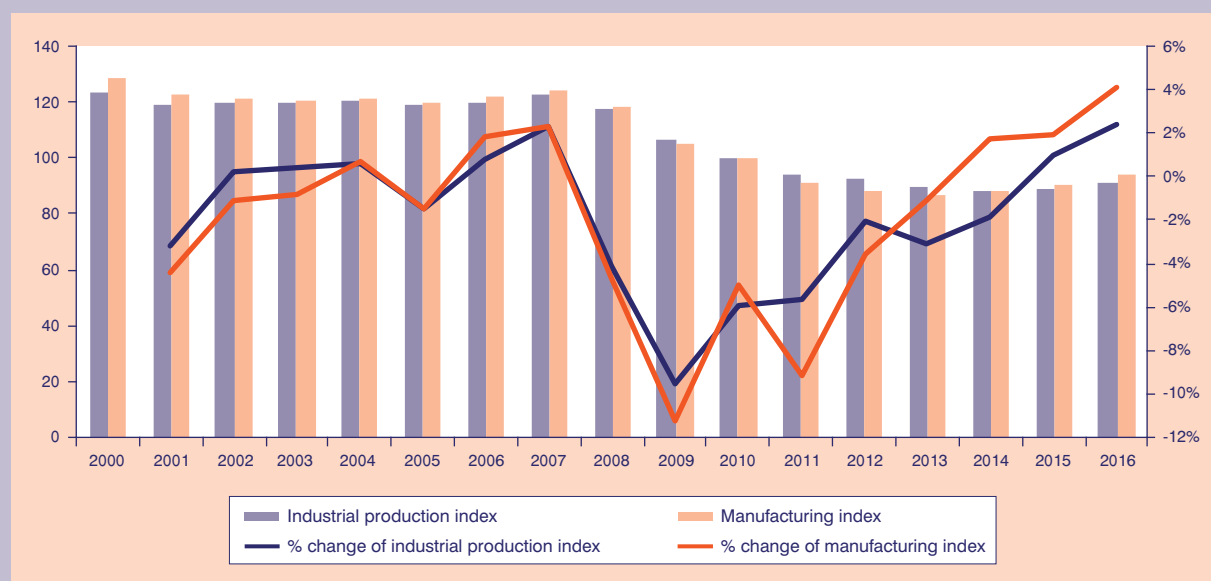ed to decrease. The industrial production index decreased for seven consecutive years, from 2008 until 2014, while in 2015 there was a marginal increase of 1% and in 2016 an increase of 2.4%, which is the largest increase observed over the period under examination. The manufacturing index decreased continuously from 2008 until 2013. In 2014 the index increased by 1.8%, in 2015 by 1.9% and in 2016 by 4.1%, the largest increase in the last 16 years.

Compared to 2007, the industrial production index decreased by 25.9%, while the manufacturing index decreased by 24.7%. These significant reductions demonstrate the extent to which the economic crisis has affected the industrial production of Greece. It is worth noting that the average annual change of the industrial production index in the period before the economic crisis (2001-2007) was -0.1%, while the average annual change for the same period for the manufacturing index was -0.4%. The respective changes for the period 2008-2016 were -3.2% and -3%. This indicates that the country's industrial production was not thriving even before the economic crisis, while the latter aggravated the existing unfavorable trend.

In order to follow the evolution of the two indices in greater detail, Figure 4.2.2 illustrates the percentage changes of the monthly industrial production index and the manufacturing index compared to corresponding months of

FIGURE 4.2.1

General industrial production index and manufacturing index and their percentage changes

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

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

FIGURE 4.2.2

Percentage changes in the industrial production index and the manufacturing index, compared to the corresponding month of the previous year
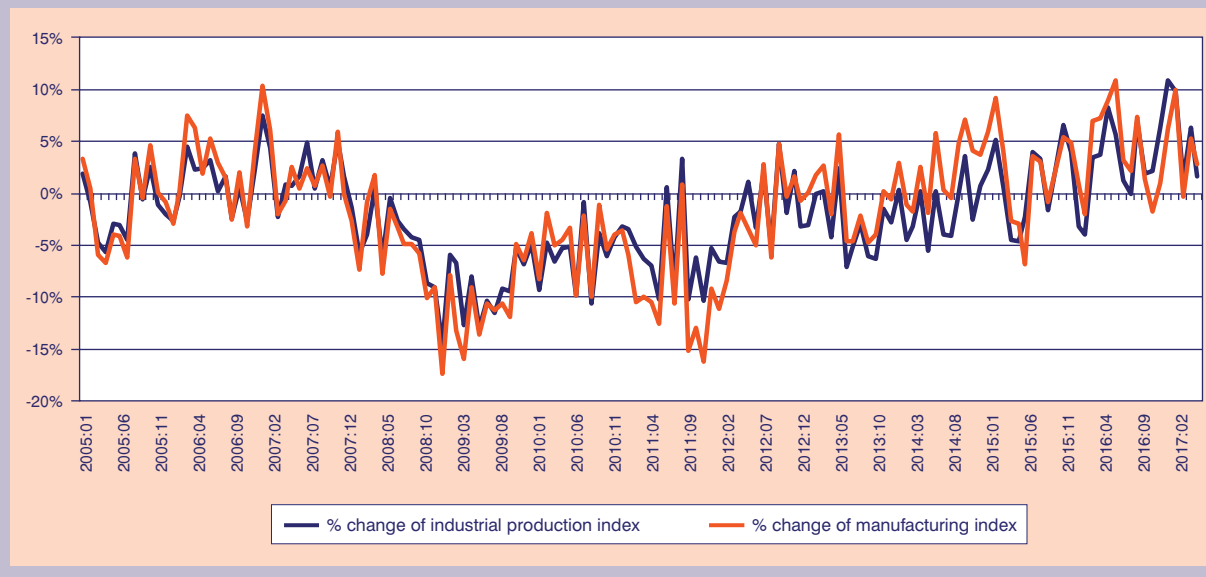
FIGURE 4.2.3

Percentage changes of the industrial production indices compared to the previous year

the previous year. Both indices follow a similar course. In 2014, the first signs of recovery appeared. The monthly changes of the two indices have a positive sign for most of 2015. In 2016, the monthly changes of the industrial production index are negative for only three months (February, March and September), while the monthly changes of the manufacturing index are negative for only two months (March and December). It should be noted that in July 2016 the manufacturing index increased by 10.87% (compared to the corresponding month of the previous year), the largest increase observed during the

period under examination (January 2001-June 2017). The first semester of 2017 was also positive. The average monthly change of the industrial production index is 6.06% and that of the manufacturing index is 4.14%. Moreover, the industrial production index increased in February 2017 by 10.85% (compared to February 2016), the largest increase recorded during the period under consideration.

Important information is also provided by the indices of energy, intermediate goods, capital goods, du-

rable consumer and non-durable consumer goods. Figure 4.2.3 above presents the percentage changes of these indices compared to the previous year. From 2008 until 2014, all five indices decreased with only a few exceptions (the energy index in 2012, the intermediate goods index in 2014 and the non-durable consumer goods index in 2014 increased). In 2015, all indices increased. The durable consumer goods index presented the largest increase among all five indices, by 2.7%. In 2016, with the exception of the durable consumer goods index which decreased by 2.1%, the indices increased. The largest increase was recorded in the index of intermediate goods (which was the largest increase observed in this index since 2001), followed by the capital goods index (also the largest increase observed since 2001). The first half of 2017 appears to be particularly positive for all indices, the non-durable consumer goods index is the only exception, which recorded an average monthly decrease of 2.1%. For the remaining indices the average monthly change is: 11.7% for the energy index, 6.4% for the intermediate goods index, 8.1% for the capital goods index and 4.6% for the durable consumer goods index.

4.2.2. Industrial turnover indices

Important information can also be drawn from the industrial turnover index.[3] Figure 4.2.4 illustrates the industrial turnover indices (general, domestic market

and non-domestic market), while Figure 4.2.5 presents the percentage changes of the three indices. The economic crisis affected the industrial turnover indices in 2009, while the industrial production indices started to decrease since 2008. All three indices decreased significantly, by more than 22%, in 2009 compared to 2008. The domestic market index continued to decrease until 2016. The index falls below 80 for the first time in 2015 and remains below 80 in 2016. Following the significant fall in 2009, the non-domestic market index recorded significant increases over the next three years (2010-2012). During the last four years under examination (2013-2016) the index decreased. In 2015, the second largest decrease, during the period under examination, is recorded, 11.5%, and in 2016 the third largest decline, 7.4%. The general turnover index follows a similar course. The index increased during 2010-2012 and decreased during 2013-2016. Moreover, in 2015, the second largest decrease is observed, 10.1%, and in 2016 the fourth largest decrease, 5% (the third largest was in 2013, 5.9%).

In order to follow the evolution of the three indices in greater detail, Figure 4.2.6 illustrates the percentage changes of the monthly turnover indices compared to the corresponding months of the previous year for the period January 2005-June 2017. 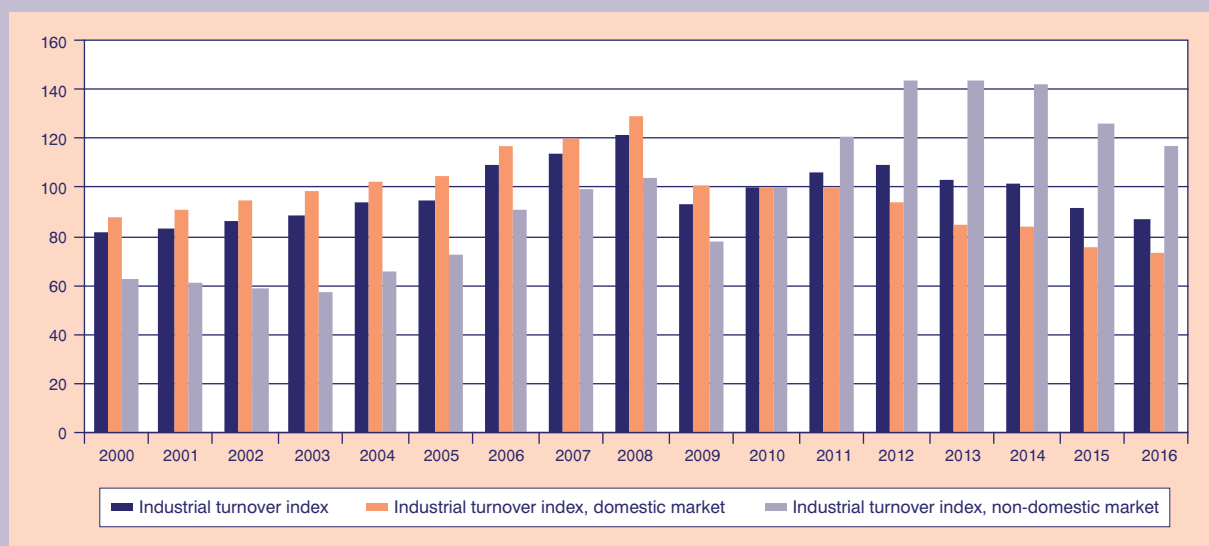From November 2014 until July 2016 the general turnover index decreased continuously. The domestic market index decreased from November 2014 until July 2016 (December 2015

FIGURE 4.2.4
Turnover indices

Legend: Industrial turnover index / Industrial turnover index, domestic market / Industrial turnover index, non-domestic market

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

FIGURE 4.2.5

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

Legend:
- % change of industrial turnover index
- % change of industrial turnover index, domestic market
- % change of industrial turnover index, non-domestic market
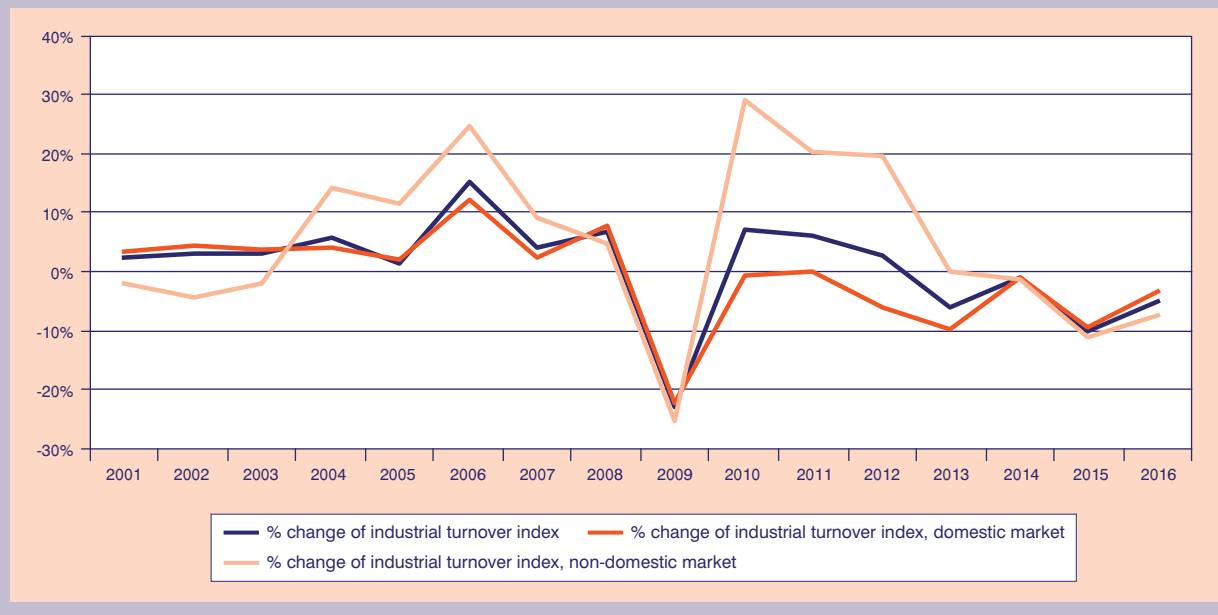
FIGURE 4.2.6

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

Legend:
- % change of industrial turnover index
- % change of industrial turnover index, domestic market
- % change of industrial turnover index, non-domestic market
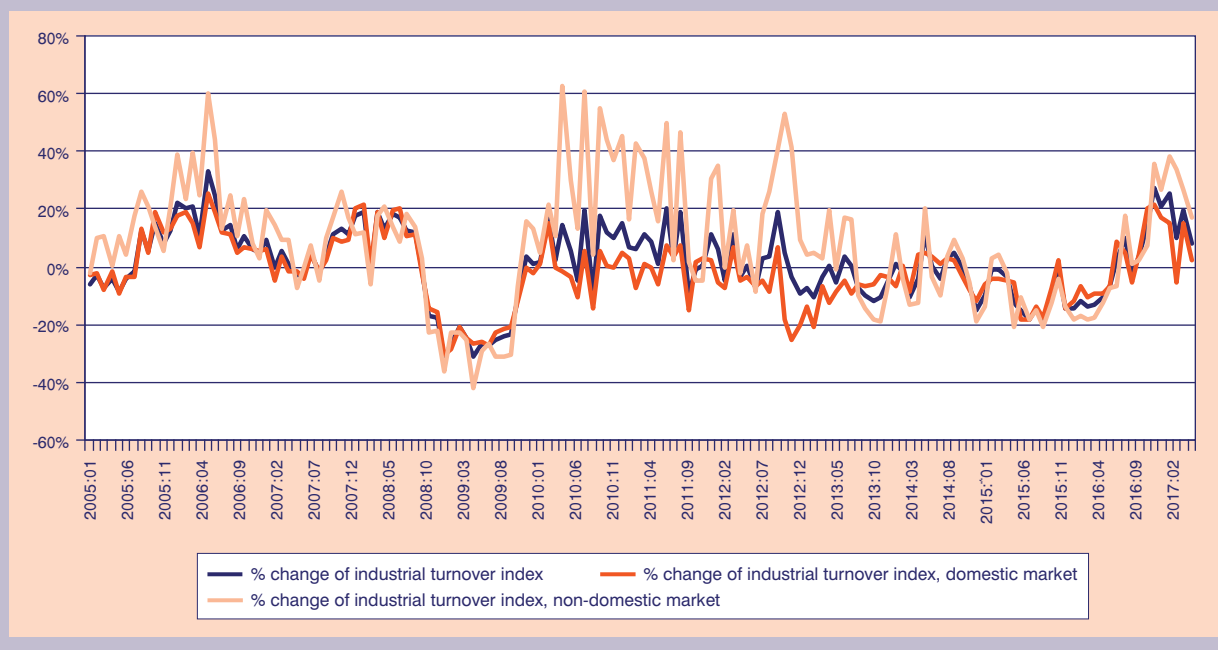
was the only exception). The non-domestic market index decreased continuously from May 2015 until August 2016. The first semester of 2017 appears to be positive for the three indices. The average monthly change for the general index is 18.5%, for the domestic market index is 10.9% and for the non-domestic market index is 29.5%.

4.2.3. Conclusions

For the second consecutive year after 2008, when the impact of the economic crisis became apparent, the industrial production index recorded an increase of 2.4% in 2016. The manufacturing production index increased in 2016 for the third consecutive year.

The data for the first half of 2017 are encouraging as the industrial production index increases continuously and the manufacturing production index also increases, with the exception of April, when a marginal decrease of 0.37% is observed. Moreover, the indices of four of the main industrial groupings (energy, intermediate goods, capital goods, and non-durable consumer goods) increased in 2016, compared to 2015. These four indices presented positive monthly rates of change for the first half of 2017. The only exception is the durable consumer goods.

On the other hand, the industrial turnover indices continued to decline in 2016, but the decrease was smaller compared to that of 2015. The first signs for 2017 are positive, as the three turnover indices present steady increases (the only exception is the domestic market index that decreased in April 2017 compared to April 2016). The average monthly changes of the three indices are positive and larger than the corresponding changes of the previous year. These increases in monthly turnover indices may be the first indication that, after four years of continuous reductions, in 2017 the industrial turnover indices will increase.

Special topics

Determinants of student academic performance: Evidence from an Economics Department

Daphne Nicolitsas*

1. Introduction

Educational issues raise strong interest from the public; data on the search frequency of individual terms on the world wide web suggest that hits for the term "education" far outweigh those for the terms "pensions" or "criminality". European Social Survey (ESS Rounds 1-5) data show that between 2002 and 2010 the percentage of individuals who think that the overall state of education in Greece is bad has increased. Despite the rise in dissatisfaction with the state of education in Greece there is no structured or informed debate on the issue nor consistent and far-reaching policies. In other developed countries (see e.g. Canada, Finland, the UK the USA), in contrast, the debate includes an informed exchange of views based on *inter alia* the results of scientific research on educational matters.

One of the issues that worries the public (teachers, students, parents) is the transition from high school to tertiary education. Until a few years ago the concern of students and their parents was to secure a place in tertiary education. Now, however, the interest has shifted to the ability to complete a degree within a reasonable time period and to find a job following graduation. The change in focus may be a consequence of the large increase in the number of those enrolled in tertiary education that took place without a reform of secondary and tertiary education and with no improvement of the link between universities and the labor market (see IOBE, 2017 and OECD, 2011).

Therefore, looking at the determinants of student academic performance is likely to be of interest.

This article presents the results from an initial investigation of whether the preferences and achievements of high school students can predict their performance at university. Section 2 looks at whether students' preferences for the faculties in which they are currently studying are correlated with tertiary education completion rates. In Section 3, we focus on a single higher education institution for which we have more information on the students' high-school and academic achievements.

2. Number of admissions, entry requirements and completion rates in universities: The overall picture

2.1. Number of admissions and entry requirements

Between 1992 and 2017, the number of students enrolled in tertiary education (Higher Education Institutions [AEI] and Technological Educational Institutes [TEI]) almost doubled (see Chart 1).[1] The change was the result of both an increase in the number of entrants to Departments, Faculties and Institutions already in existence at the beginning of the 90's, as well as the creation of new ones. For the largest part

CHART 1
Number of tertiaty education places, 1992-2017
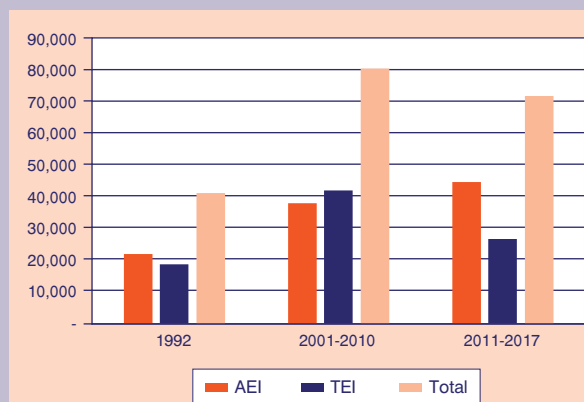
Sources: Ministry of Education, Life Long Learning and Religion for 2001-2010 and Ministerial Decisions for 1992-2000.

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* Assistant Professor, Department of Economics, University of Crete.

1. The number of entrants in each Department is decided annually by the Ministry of Education following suggestions of the individual departments. The numbers suggested by the Departments are in general lower than the number of entrants finally decided by the ministry.

of these 25 years, the admission of students into tertiary education was based on students' comparative performance and preferences. Only between 2006 (admission for the academic year 2006-07) and 2009 (admission for the academic year 2009-10) was a threshold on student performance used to qualify for entry.[2] The increase in tertiary education places in conjunction with the lack of a threshold appears to have had a greater impact than any increase in demand for tertiary education as the grades (points) at the cut off for entry qualification declined significantly in the first half of the 2000s.

Admission to university is, however, only a necessary condition for obtaining a higher education degree as completing the degree is by no means a certainty (see IOBE, 2017 and OECD, 2011).

Low completion rates are attributable to a number of reasons, including the need for students to work in order to cope financially, a factor that has become more important during the recent economic crisis; student frustration due to, *inter alia*, lack of interest and difficulty coping with academic requirements; the failure of academic departments to create an attractive environment and the challenge of transiting from university to the labour market (see IOBE, 2017; OECD, 2011 and Karamessini, 2008).

### 2.2. Mismatch between pupils' preferences and the Departments to which they are admitted

The grades of students in specific subjects, their own assessment of their ability to cope with the curriculum in each subject, the likely conditions of the work environment including the expected income, the approval of the subject by parents and the social environment are among factors the literature has identified as having an impact on students' choice of major (see, among others, Kugler, Tinsley and Ukhaneva, 2017; Kirkeboen, Leuven and Mogstad, 2016; Wiswall and Zafar 2015; Zafar, 2013 and Beffy, Fougère and Maurel, 2012).

In the Greek system of access to higher education, successful candidates in the system of Pan-Hellenic Examinations are admitted to a specific Department (not a Faculty), the subject of which is often very narrowly defined (e.g. Informatics with Biomedical Applications, Utilization of Natural Resources and Agricultural Engineering, Preschool Education and

Educational Design, etc.). The Department to which a student is admitted is based on the grades of the prospective student (an overall average of performance in Pan-Hellenic Examinations and high-school performance translated into points), the demand for the chosen Departments and his/her preferences. The candidate can select a large number of Departments that may even belong to completely different fields of science (e.g. the choices of students in the so-called Economics and Computer Sciences track direction in high school include both Education and Economics Departments).[3] Cognitive psychologists have expressed concerns (see, among others, Blakemore, 2014) about the ability of 16 and 17 year olds to identify the field that suits them best. However, permitting students to choose over a wide range of Faculties and Departments in which they can finally be admitted does not solve the problem of potential mismatch between the preferences and inclinations of prospective students, on the one hand, and the knowledge, skills and qualifications that each department asks for and provides, on the other. This is especially true since most higher education establishments do not provide for joint majors or the option of changing major once admitted.

CHART 2
Proportion of students who declare each Department in their first three choices (horizontal axis) and proportion of students who have exceeded the minimum length of studies in the Department (vertical axis)
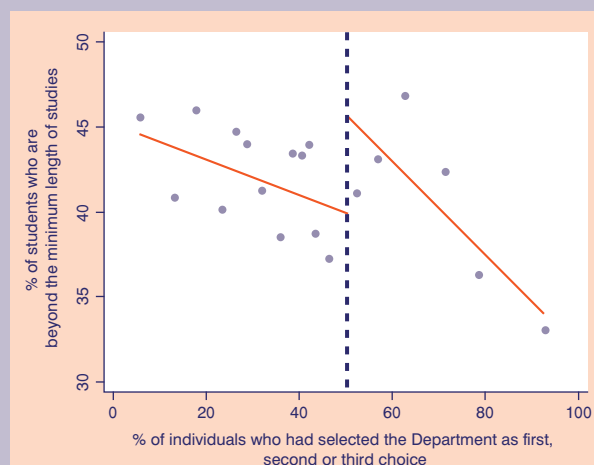
Sources: ELSTAT, *Education Statistics* and Ministry of Education data (author calculations).

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2. See L.3404/2005 for the introduction of this provision (Article 13, para. 1) and L. 3848/2010 for its abolishment (Article 35, para. 1).

3. The article does not reflect changes in admission to higher education decided during 2017.

Using data on the proportion of students in each Department who have exceeded the minimum duration of studies and the ranking of the Department in students' preferences, we investigate the hypothesis of a negative correlation between the percentage of students who selected a Department amongst their first three choices and the percentage of students who have exceeded the minimum duration of studies. The intuition is that those who were admitted in a Department that was high in their preferences are better inclined and motivated to complete their studies at a faster pace. Chart 2 above summarizes the data and shows that the higher the percentage of students who have chosen the Department amongst their first three choices, the lower the percentage of students who have exceeded the minimum length of studies in the Department. This negative relationship appears to be more pronounced when the percentage of students who prefer the Department (as a first, second or third option) exceeds 50%.

In the next section, we use data from a specific AEI Department to look at, among other things, the correlation between high school and academic performance.

3. Correlation between school and academic performance

3.1. Introduction

The existence of an association between school and academic performance is largely anticipated as both are affected by individuals' skills. Skills, however, are not the only determinant of performance. Academic performance is also shaped, *inter alia*, by subject knowledge, the match between on the one hand the students' knowledge and competences and, on the other, the skills required by the academic department, students' preferences and the quality of studies in the academic Department. The relative importance of each of these determinants cannot be easily assessed as some are not easily observable or quantifiable (e.g. level of skills) while others are interdependent (e.g. a skilled student can use information in a more effective way than a less skilled student). Notwithstanding the above constraints, we proceed to look at the association between high school and student performance in a University Economics Department.

3.2. Economics studies

Economics is a subject field in which the number of admitted students and the number of Departments has increased significantly over time (see Pagoulatos and Bourikos, 2006). Chart 3 shows the number of admissions between 1992 and 2015 in (purely) Economics Departments. The increase in the number of students between 1992 and 2005 reflects the establishment of new Departments, while from 2005 the number of Departments is stable. Chart 3 shows an increase of approximately 30% between 2005 and 2015 in the total number of students admitted to these Departments. However, the rise has come exclusively from Dpartments located in Universities outside Athens and Thessaloniki where the number of students more than doubled.

CHART 3
Number of students admitted in Economics Departments
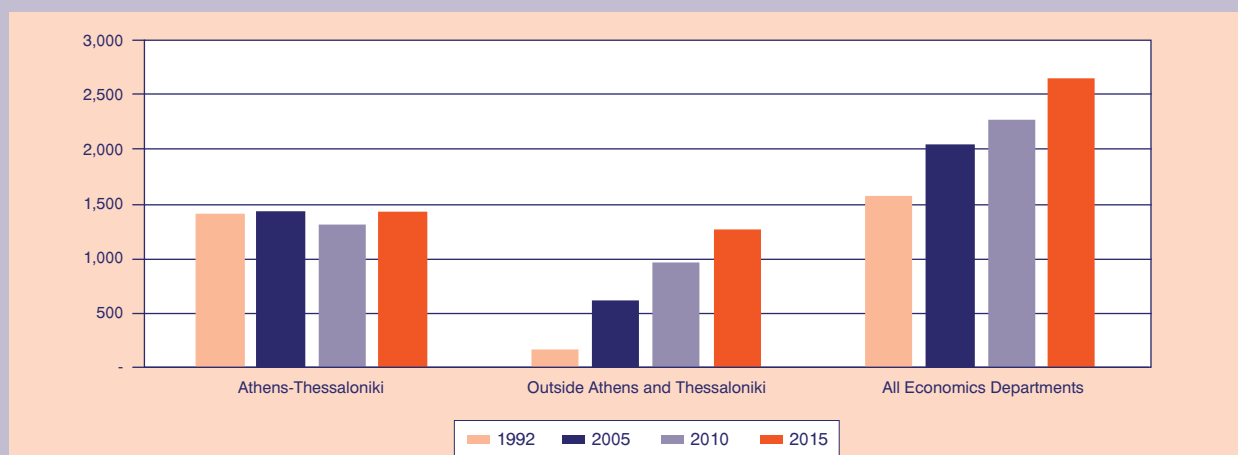
Source: Ministry of Education (author's calculations).

CHART 4
Admittance thresholds (in points) in Economics Departments, 2008 and 2017
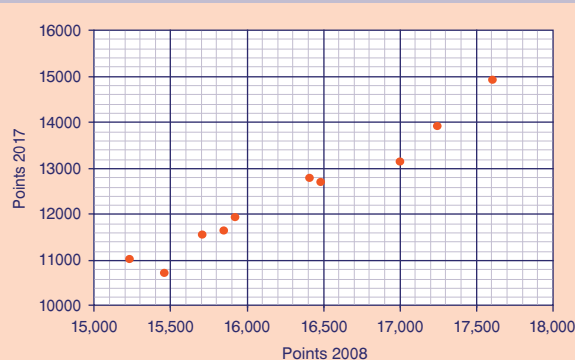
Source: Ministry of Education.

These developments took place at a time when the Economics curriculum changed significantly, with the main element of change being the increased focus on mathematics. The preparation of prospective university students did not change to the same extent, however, while students lack information about the nature and content of the university curriculum.

Between 2008 and 2017, entry requirements, as measured by the total number of points each student achieved, have declined. This is shown in Chart 4, which depicts the points of the last entrant in each Department. Furthermore, the percentage of students graduating with "Excellent", the equivalent of a UK "First", from these Departments (see Chart 5) is very low. On average for all Departments, this figure for the academic year 2013-14, the last year for which data are available, is only 1.4%.

The data used in the remainder of the paper refer to the total number of students admitted, after taking the Pan-Hellenic Exams, in an Economics Department for three consecutive academic years starting with 2004-05 (i.e. participation in the Pan-Hellenic Exams in June 2004). Admissions after Pan-Hellenic Examinations account for the highest percentage of admissions in each department. Candidate students for Economics Departments could follow one of three tracks in high school: Economics and Computer Sciences, Hard Sciences or Humanities, provided they sat for a Pan-Hellenic Exam in *Prin-*

ciples of Economics. The available information on the options and performance of the admissions high school is summarized in Table 1.

Most students followed the so-called Economics and Computer Sciences track (see Table 1). Between 2004 and 2006 grades in the following subjects were taken into account: Modern Greek Language, History, Elements of Mathematics and Statistics, Advanced Mathematics, Physics, Principles of Organization and Business Management, Computer Science and Programming Principles and Principles of Economics.[4]

Three points emerge from Table 1: first, the very low percentage of students who chose the department as their first choice; second, the very high percentage of students who had selected non-Economics Departments as their first choice; and third, the relatively moderate student performance as judged by either the grade of the School Leaving Certificate or the overall admission points.

Table 2 presents detailed information on the scores in individual courses that are included in the calculation of overall admission points.[5] Courses are graded on a one to twenty scale. Averages are presented for both the sample as a whole and for students in the top percentile (highest 10% of admission points) and for students in the lowest percentile (lowest 10% of admission points).

The figures in the table suggest that students have the most difficulty with: Modern Greek Language, Advanced Mathematics and Physics. Grades for class performance are higher than grades on written tests and usually differ as much as the maximum permissible difference of two points. Advanced maths grades are particularly low for most admitted students, even for those who are in the top percentile of the distribution.

Table 3 shows the distribution of the length of time to the degree for students admitted to the Department in the period 2004 to 2006. The average duration of studies for those who have completed their studies is 11.1 semesters, i.e. slightly over 5 years, and the median time for completion is 10 semesters, i.e. exactly 5 years. The minimum completion time is 8 semesters (4 years) and the maximum completion time for studies is 23 semesters (i.e. just over 11 years).

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4. Physics and Biology were examined by Pan-Hellenic Examinations only up to 2005.

5. In 2004 and 2005 the number of General Education courses that were taken into account were five as History, Physics and Biology were also included.

CHART 5
Proportion of graduates by degree class, academic year 2013-14
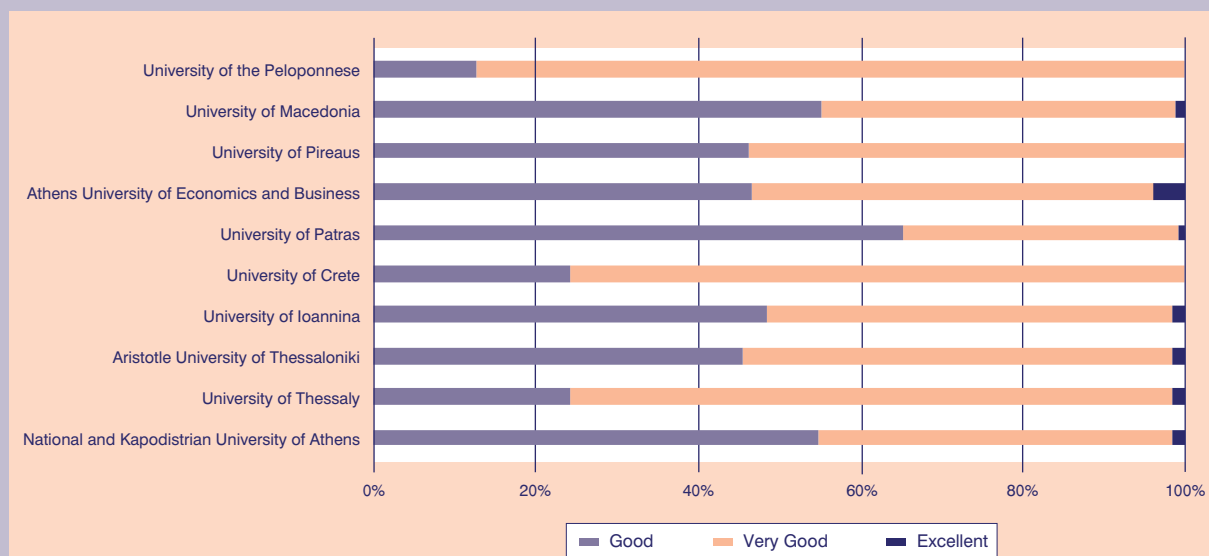
Source: ELSTAT, *Education Statistics* (author's calculations).

TABLE 1 High-school performance and choices of students admitted to the Department during 2004-2006

	2004	2005	2006
Admission means			
Pan-Hellenic Examinations	82.7	80.9	83.5
Other means	17.3	19.1	16.5
Track followed in high school			
Economics and Computer Sciences	78.3	77.1	87.8
Hard Sciences	14.5	13.7	7.4
Humanities	7.2	9.2	4.7
High-school performance			
Graduation grade in the penultimate year in high school	16.00	15.98	16.17
High-school Leaving (Apolytirion) Certificate grade	17.026	16.89	17
Admission points	16,005.60	15,714.19	15,783.87
% of admitted students for whom the Department was their first choice	23.6	14.9	16.5
% of admitted students for whom the Department was between second and fifth choice	23.70	23.57	25.46
% of admitted students who had selected a non-economics Department as their first choice	35.60	47.20	67.70

Source: Calculations using the Department's data.

TABLE 2 High-school performance

A. All admitted students

	2004		2005		2006	
	Class performance grade	Written test grade	Class performance grade	Written test grade	Class performance grade	Written test grade
General education courses						
Modern Greek Language	15.1	13.2	15.3	13.2	14.8	13
History	16.2	14.4	15.7	14		
Mathematics & Elements of Statistics					19.0	17.8
Track-specific courses						
Advanced Mathematics	14.1	12.1	13.6	11.4	13.1	11.1
Physics	14.1	12.2	12.8	10.6	13.6	11.7
Principles of Organization and Business Management	16.2	14.4	16.9	14.9	17.5	16.2
Computer Science and Programming Principles	17.3	16.8	16.7	14.8	16.9	15.3
Elective courses						
Principles of Economics	18	16.8	18.6	16.9	19	17.9

B. Students in the top percentile

	2004		2005		2006	
	Class performance grade	Written test grade	Class performance grade	Written test grade	Class performance grade	Written test grade
General education courses						
Modern Greek Language	16.8	14.5	15.6	14	14.7	12.7
History	17.6	16.1	16.3	14.6		
Mathematics & Elements of Statistics					19.6	18.9
Track-specific courses						
Advanced Mathematics	17.7	15.9	13.7	11.7	15.6	13.7
Physics	18.5	17.1	14.4	12.6	16	14.2
Principles of Organization and Business Management	18.6	17.1	17.2	15.4	18.8	17.7
Computer Science and Programming Principles	19.0	18.2	18.6	17.4	18.7	17.7
Elective courses						
Principles of Economics	19.9	19.7	19.6	19	19.6	19

C. Students in the bottom percentile

	2004		2005		2006	
	Class performance grade	Written test grade	Class performance grade	Written test grade	Class performance grade	Written test grade
General education courses						
Modern Greek Language	15.3	13.5	15	13.2	14.5	12.8
History	15.1	13.4	15.5	13.9		
Mathematics & Elements of Statistics					18.8	17.8
Track-specific courses						
Advanced Mathematics	13.6	11.6	13.3	11.4	12.5	10.5
Physics	12.1	10.5	12.6	10.7	11.9	10
Principles of Organization and Business Management	15.2	13.3	17.8	16.2	18	16.4
Computer Science and Programming Principles	16.8	14.8	15.9	14.3	15.8	14.2
Elective courses						
Principles of Economics	17.5	16.5	17.7	16.6	18.7	17.5

Source: Calculations using the Department's data.

TABLE 3 Distribution of length of time to graduation (% of students)

4 years	17.58
5 years	34.34
>5 and up to 6 years inclusive	17.86
>6 and up to 10 years inclusive	18.13
Over 10 years	12.09

Source: Calculations using the Department's data.

Note: The last interval includes individuals admitted to the Department between 2004-2006 who had not completed their studies by 2016.

3.3. Academic performance

Student grades, both for individual subjects and for the degree, can be considered as the output of a production process which can be schematically represented as follows:

$$Y = \varphi(x, z) \tag{1}$$

where Y is the grade in a particular subject or the degree, x is a vector of inputs to the production process and z captures the demographic features of the student. Inputs include students' efforts and inclinations, the knowledge they have gained, and demographic features such as age and gender.

Unfortunately, evidence on students' effort is not readily available, although some papers use students' self-reported study time and/or attendance of lectures. As it is unclear whether the "weaker" students study longer, it is possible, if the analysis between academic performance and study hours does not take this endogeneity into consideration, to end up with paradoxical results. Certain previous studies (see, eg, Schuman *et al.*, 1985) concluded that longer study hours do not necessarily lead to better academic performance. Recent surveys, however, seem to acknowledge a positive role for study times (see, among others, Beattie, Laliberté and Oreopoulos, 2016 and Bonesrønning

and Opstad, 2012). The positive role of lecture attendance, on the other hand, appears less disputed. In the analysis in this article, we do not use data for study hours or lectures as they are not available.

As far as students' aptitudes are concerned, these are not directly observable or measurable. In the literature, these are usually proxied with scores in assessment tests or class performance and we will do the same. The aim is to investigate whether, beyond the general level of students' skills, which we proxy with the grade of the School Leaving Certificate (Apolytirion), students' grades on specific subjects (Advanced Mathematics and Modern Greek Language) can predict both their degrees in basic compulsory courses of the economics curriculum and the degree grade.

Pedagogists, psychologists and economists emphasize the importance of incentives for academic performance (see, among others, Almlund, Duckworth, Heckman and Kautz, 2011). In the absence of any other information about students' motivations, we proxy these by the order in which students chose the Department to which they are finally admitted.

We also take into account demographic factors (gender) as most surveys show that there are statistically significant gender differences in performance with women performing better than men at both school and university.[6]

Finally, in the analysis we take into account the academic year the student is taking each subject in order to condition for changes in the curriculum and in faculty members.

3.4. Grades in main compulsory courses

We look at determinants of students' grades in the following three compulsory courses in the first year of the curriculum: Mathematics I, Microeconomics I and Macroeconomics I. The analysis follows that of Dolado and Morales (2007). The data we use in this analysis are the grades of students once they have been successful in passing the final exam.[7]

In order to have an overview of the distribution of grades in the individual courses, we present in Table 4 the distribution of student grades in each course by certain features: gender, track followed in high school, School

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6. Other studies use more demographic features, e.g. age, nationality, region of origin. In the instance investigated here, however, the first two features do not vary significantly in the sample while the third characteristic, which shows differentiation in the sample, will be looked into in a subsequent stage of the study.

7. The use of data only when students have successfully sat the exam creates methodological issues as data are "truncated". This will be dealt with in a subsequent analysis.

TABLE 4 Distribution of students by grade in three compulsory university courses %

	Mathematics I			Macroeconomic Theory I			Microeconomic Theory I		
	Good	Very Good	Excellent	Good	Very Good	Excellent	Good	Very Good	Excellent
Gender									
Male students	51.72	36.21	12.07	56.90	32.76	10.34	65.22	31.30	3.48
Female students	46.39	37.95	15.66	49.40	34.34	16.26	64.46	25.90	9.64
High school track									
Economics and Computer Sciences	46.48	38.68	14.84	56.59	30.23	13.18	67.76	26.94	5.31
Humanities	52.63	36.84	10.53	35.00	55.00	10.00	42.11	52.63	5.26
Hard Sciences	60.00	26.67	13.33	37.93	48.28	13.79	50.00	28.57	21.43
Grades in high school									
School Leaving Certificate	16.80	17.00	17.10	16.80	16.90	17.40	16.80	16.90	17.60
Advanced Mathematics	11.70	12.10	12.70	11.60	12.50	12.70	11.70	12.50	13.70
Modern Greek Language	13.90	13.70	13.50	13.60	14.00	13.80	13.80	13.50	14.60
Order in which students ranked the Department in their choices									
First three choices	52.29	28.44	19.27	61.11	26.85	12.04	61.11	30.56	8.33
Fourth to eighth choice	60.67	23.60	15.73	60.44	27.47	12.09	65.12	30.23	4.65
Lower than eighth choice	63.73	28.43	7.84	59.22	25.25	15.53	68.82	24.73	6.45

Source: Calculations using the Department's data.

Leaving Certificate grade and high-school grades in Advanced Mathematics (only for those who followed the Economics and Computer Sciences track) and in Modern Greek Language. University exams are graded on a one to ten scale and a pass requires at least a 5. Grades are grouped into three classes: *Good* if the grade is between 5 and 6.49; *Very Good* for grades between 6.5 and 8.49 and *Excellent* for grades from 8.5 and higher. Table 4 shows the percentage of students in each grade class, i.e. percentages per subject add up to 100. The lines corresponding to the *Apolytirion* grade or to individual high-school grades show averages, e.g. students with an *Excellent* grade in Mathematics I at university have a grade of 12.7 out of 20 in Advanced Mathematics.

The following observations arise from Table 4:

(a) The percentage of students with *Excellent* grades is very low. The overwhelming majority of students obtained a *Good* grade.

(b) In all courses women get better grades than men.

(c) Students who have followed the Hard Sciences track in high school, which is about 10%, as shown in Table 1, have a higher probability than students who followed any of the other tracks to achieve high grades in the Economics course (Macro and Microeconomics).

(d) The School Leaving Certificate grade and the grade in Advanced Mathematics appear to be positively correlated with the grades in university courses.

(e) Students' grades in Modern Greek Language do not show large variation among students.

An alternative way to capture differences between individual groups is to look at the percentage of students with a Good, Very Good or Excellent grade. Comparing these percentages with the composition of the

	(1) Mathematics I	(2) Macroeconomic Theory I	(3) Microeconomic Theory I
Apolytirion grade	0.175*	0.226**	0.117
	(0.073)	(0.071)	(0.071)
Advanced Mathematics	0.054*	0.049~	0.035
	(0.023)	(0.025)	(0.025)
Modern Greek Language	-0.052~	-0.009	0.010
	(0.030)	(0.031)	(0.028)
Order of preference	-0.019*	0.007	-0.012
	(0.010)	(0.011)	(0.010)
Number of observations	248	248	247
R^2	0.169	0.099	0.082

Notes:

1. Robust standard errors in brackets.

2. Superscripts on estimates suggest statistical significance as follows: *** $p<0.001$, ** $p<0.01$, * $p<0.05$, ~ $p<0.10$.

sample[8] we can highlight differences in performance. For example, while female students make up 59% of the sample, the percentage of women among those with *Excellent* grades is much higher. It also appears that in all subjects among those who excelled, the percentage who chose the Department in their first three choices is much higher than the percentage of those who chose the Department in their first three choices in the sample as a whole, which is 36%.

Function (1) can be specified as follows

$$Y_i = a + \sum_{j=1}^{k} \beta_j x_{ji} + \sum_{h=1}^{m} \gamma_h z_{hi} + e_i \qquad (2)$$

where Y is the grade of student i in each of the three subjects we are looking at, x_j are the k variables proxying students' skills and preferences and z_h represents the m demographic variables. Coefficient estimates are obtained from OLS regressions and estimates are presented in Table 5.

In order to make comparisons between the effects of individual variables on the grades on compulsory subjects, we use the standardized grades in the estimates

presented in Table 5.[9] Each column in Table 5 corresponds to the grade in a different subject. Regressions also include variables for the year in which the student successfully sat the exam. A gender dummy and a constant are also included in the regressions although they do not appear in the Table. The gender dummy is not statistically significant in two of the three subjects. From Table 5, it seems that the interpretive capacity of the regressions is low as witnessed by the R^2 value, but this is also observed in other studies which use similar cross-sectional data (see e.g. Oreopoulos and Petronijevic, 2016). The results suggest that a high grade on the School Leaving Certificate is associated with higher grades in two of the three compulsory courses. More specifically, an additional point on the high school *Apolytirion* is associated with a 0.25 point higher degree in Mathematics I and a 0.3 point higher degree in Macro I. Furthermore, although the grade in Advanced Mathematics has already been taken into account in calculating the Apolytirion grade, a higher grade in Advanced Mathematics is associated with a 0.1 point higher grade in Mathematics I and Macroeconomics I. Performance in Modern Greek Language seems to bear a negative association with university

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8. The data used in the analysis constitute a sample of the entire population of the students in the Department (i.e. of all the students who have attended the Department in all its years of operation). However, for the specific time period we are looking at here, the data constitute the entire population of students that were admitted to the Department following Pan-Hellenic Exams.

9. Standardized grades have a mean of zero and a variance of one.

TABLE 6 Ordered logit grades estimates (marginal effects)

	(1) Mathematics I Good	(2) Mathematics I Excellent	(3) Macroeconomic Theory I Good	(4) Macroeconomic Theory I Excellent	(5) Microeconomic Theory I Good	(6) Microeconomic Theory I Excellent
Apolytirion grade	-0.063~	0.034~	-0.0911**	0.047*	-0.031	0.0085
	(0.034)	(0.018)	(0.032)	(0.019)	(0.033)	(0.0096)
Advanced Mathematics	-0.019~	0.011~	-0.026**	0.013*	-0.014	0.0039
	(0.011)	(0.006)	(0.012)	(0.0067)	(0.012)	(0.0033)
Modern Greek Language	0.024	-0.013	-0.00132	0.00068	0.0032	-0.00088
	(0.014)	(0.0077)	(0.016)	(0.008)	(0.013)	(0.0035)
Order of preference	0.013**	-0.0073**	-0.002	0.00083	0.0059	-0.0016
	(0.0050)	(0.0029)	(0.0053)	(0.0027)	(0.005)	(0.0014)
Number of observations	248	248	248	248	247	247
Pseudo-R^2	0.0827	0.0886	0.0477	0.0477	0.0425	0.0425

Notes:
1. The dependent variable takes three values that correspond to the grade class: Good, Very Good and Excellent.
2. The coefficients show the extent to which changes in the independent variables have an impact on the probability of the grade being «Good» (first column for each subject) or «Excellent» (second column for each subject).
3. Robust standard errors in brackets.
4. Superscripts on estimates suggest statistical significance as follows: *** p<0.001, ** p<0.01, * p<0.05, ~ p<0.10.

TABLE 7 Quantile degree grades estimates

Quantiles	(1) Mathematics I 35%	(2) Mathematics I 50%	(3) Mathematics I 75%	(4) Macroeconomic Theory I 40%	(5) Macroeconomic Theory I 50%	(6) Macroeconomic Theory I 75%
		High-school performance				
Apolytirion grade	0.224*	0.151	0.135	0.265**	0.279*	0.195
	(0.102)	(0.111)	(0.084)	(0.101)	(0.108)	(0.148)
Advanced Mathematics	0.038	0.048	0.097**	0.045	0.097*	0.102~
	(0.036)	(0.039)	(0.030)	(0.036)	(0.038)	(0.052)
Modern Greek Language	-0.026	-0.027	-0.063~	0.024	0.017	-0.042
	(0.046)	(0.050)	(0.038)	(0.046)	(0.049)	(0.067)
		Preference order (first to third choice reference group)				
Fourth until eighth choice inclusive	-0.098	0.031	-0.092	0.346	0.414~	0.099
	(0.232)	(0.253)	(0.190)	(0.230)	(0.245)	(0.337)
Lower than eighth choice	-0.188	-0.218	-0.502**	0.203	0.242	0.196
	(0.228)	(0.249)	(0.187)	(0.226)	(0.241)	(0.331)
Number of observations	248	248	248	248	248	248

Notes:
1. Robust standard errors in brackets.
2. Superscripts on estimates suggest statistical significance as follows: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, ~ $p < 0.10$.

mathematics performance. Finally, the lower the department ranks in students' preferences, the worse their performance in Mathematics I.

As the grades distribution is skewed to the left with a bunching of grades around 5, we proceed to estimates based on an ordered logit model (Table 6) and on quantile regression (Table 7). Quantile regression permits us to study the correlations between variables across the distribution of grades.

The ordered probit estimates use the categorical grades (Good, Very Good and Excellent) mentioned earlier. Table 6 above shows marginal effects from a change in the independent variables on the probability of a student's grade being *Good*, i.e. between 5 and 6.5, or *Excellent* i.e. between 8.5 and 10.0. The signs of the coefficients are in line with expectations: a better School Leaving Certificate and a better grade in high-school maths (Advanced Mathematics) increase the probability of obtaining *Excellent* while the lower the department in the students' preferences, the lower the chance for an Excellent grade.

Finally, Table 7 above shows correlations between variables across the range of grades. With this method we estimate the probability of "scoring" in each percentile compared to the previous one, exploiting the continuous nature of the variable. Quantiles have been chosen to correspond to similar grades in each subject. Thus, e.g. in Mathematics I, 35% of students have a grade lower than 5.5, while in Macroeconomics I 40% of students have a grade of 5.5 or worse. The results for Microeconomics I are not presented as there are no statistically significant coefficients. From these results it appears that performance at high school differentiates the performance of those students who are at the right end of the distribution, i.e. have higher grades.

3.5. Degree class

Chart 6 depicts the distribution of degree grades. This distribution is much closer to a normal distribution compared to the distribution of the compulsory course grades as the degree grade reflects achievement in a large number of courses (compulsory and electives). Table 8 presents estimates from an OLS regression of degree grade on variables reflecting demographic features, high-school achievements and the rank of the Department in students' choices. Estimates show that the School Leaving Certificate grade and the grade in Advanced Mathematics have an impact on the degree grade. The rank of the Department in the students' choices is only marginally statistically significant while the length of time
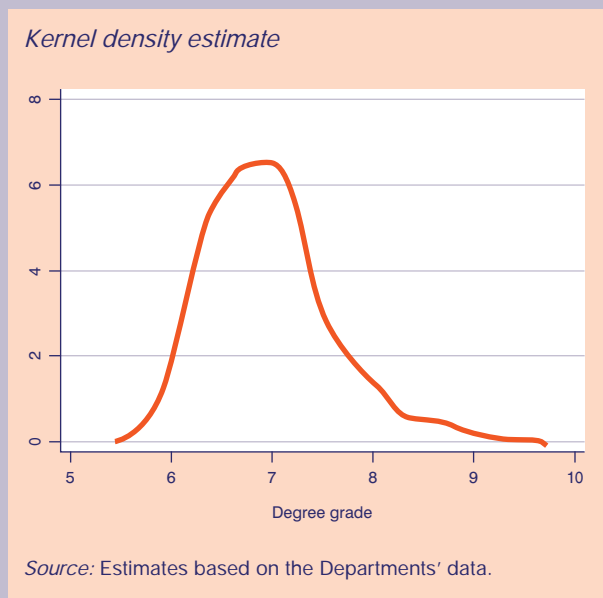
CHART 6
Distribution of degree grades

Kernel density estimate

Degree grade

Source: Estimates based on the Departments' data.

TABLE 8 Degree grade OLS estimates

High-school performance	
Apolytirion grade	0.165***
	(0.036)
Advanced Mathematics	0.028*
	(0.014)
Modern Greek Language	-0,020
	(0.016)
Order of preference for the Department (first to third choice is the reference group)	
Fourth until eighth choice	0,011
	(0.079)
Lower than eighth choice	-0,102
	(0.070)
Length of studies	
Number of semesters for completion of studies	-0.106***
	(0.013)
Constant	5.198***
	-0,667
Number of observations	248
R^2	0,418

to degree completion has a negative impact on the degree grade.

4. Summary and conclusions

The above is a first glance at an issue that concerns the educational community internationally: identifying factors that affect students' performance. School performance and students' preferences seem to affect the duration of studies and academic performance. For economics students in particular it would appear that high-school Advanced Mathematics have a positive impact on academic performance. However, an important part of any variation in university grades has not been explained by the above mentioned factors. The effect of student effort as well as the match between high-school preparation and the skills in the Department to which students are admitted needs to be investigated. Finally, we note that the asymmetric distribution of student grades is a cause for concern, as it is not clear whether these students really have achieved the expected learning outcomes.

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Regional inequality indices for regional development policies

Theodore Tsekeris*

1. Introduction

The reduction of regional inequalities constitutes the principal objective of the spatial dimension of the national growth strategy plan of Greece. The problem of the inequalities between the core region of Attiki[1] (where the capital city of Athens is located) and the peripheral regions of the country has been inadequately addressed, leading to significant opportunity losses and degradation of living conditions in less favored geographical areas. The gradual decrease of interregional inequalities can contribute to the faster and more stable recovery of the economy, through a more balanced and efficient use of regional production factors and the greater diffusion of development impacts across regions. Hence, a system of spatial indicators for monitoring regional inequalities and assessing possible regional development policies is required. Such a system would identify, on a regular basis, the needs, possibilities and location/comparative advantages of each region, as well as the production prospects and opportunities for investment and employment.

Regional inequalities can be typically expressed in relation to several statistical measures of dispersion of per capita Gross Domestic Production (GDP), which refers to a generalized measure of welfare in a region (Shankar and Shah, 2003). The inequality indices are first represented at the regional level, in relation to Attiki, as it is the most developed region of the country. The comparison of peripheral regions relative to Attiki would allow ranking their performance with regard to the best-performing region. At the national level, the measures of standard deviation, unweighted coefficient of variation, and population-weighted coefficient of variation (Williamson index) are calculated. The intertemporal evolution of these measures depicts the σ convergence. In addition, the Gini and Theil indices of inequality are calculated. Furthermore, the coefficient and speed of convergence β are estimated, showing the rate with which the less developed regions catch up to the more developed ones. Next, a composite well-being index (CWI) is presented and calculated for the Greek regions. Such a composite index can provide us with a more complete view of the (evolution of the) comparative performance of regions, taking into account not just individual indices but a combination of indices related to major objectives of the national growth strategy plan.

2. Indices of inequality among regions

2.1. Regional-level indices

The inequality of a region i in relation to the region of Attiki can be expressed by the absolute measure of the logarithm of the ratio of the per capita GDP of that region (y_i) to the per capita GDP of Attiki (y_0), as follows:

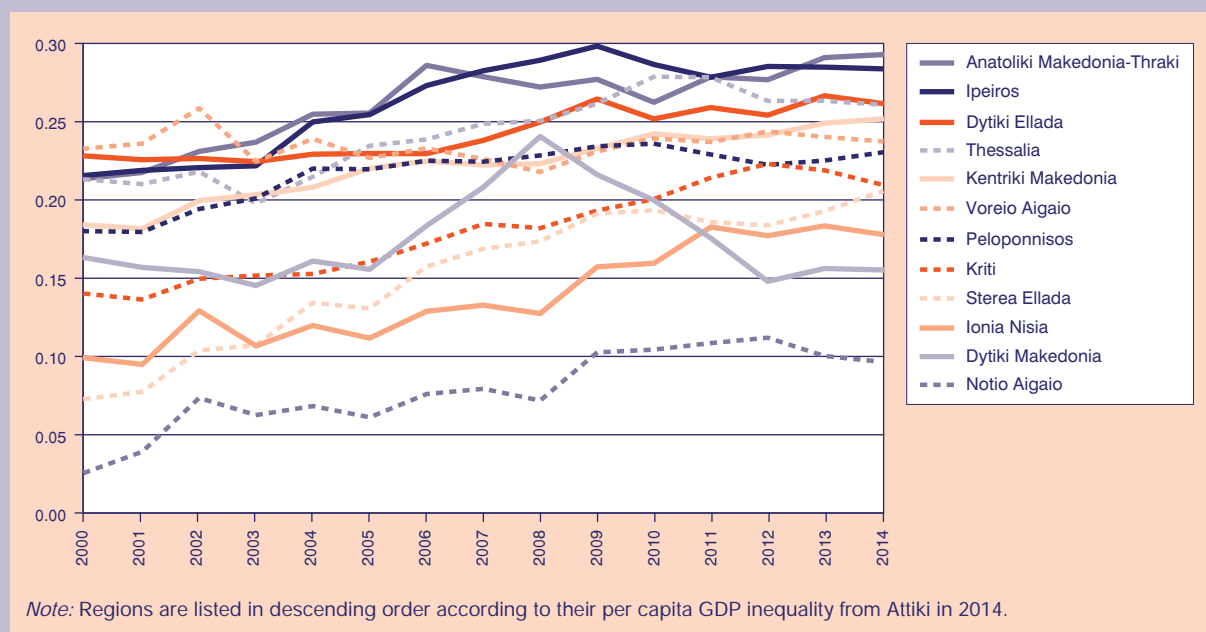$$D_i = \left| \log \left(\frac{y_i}{y_0} \right) \right|. \qquad (1)$$

According to equation (1), in case that the level of per capita GDP of region i reaches the per capita GDP level of Attiki (i.e. $y_i = y_0$), then the inequality becomes zero ($D_i = 0$). Conversely, the measure of regional inequality becomes larger as the difference between y_i and y_0 increases.

Figure 1 illustrates that all peripheral regions of Greece persistently fall behind the core region of Attiki, in terms of the per capita GDP. The measure of regional inequality follows an increasing trend in both periods before 2008 and during the crisis, except for the region of Dytiki Makedonia, whose inequality relative to Attiki decreased by -35% during 2008-2014. This considerable differentiation can be largely attributed to the fact that the gross product of Dytiki Makedonia is closely related to the operation of electric power generation units in the perfectures of Kozani and Florina. During the same period (2008-2014), the region of Ipeiros also presented a small decrease (by -2%) of its inequality in relation to Attiki.

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* Senior Research Fellow, Centre of Planning and Economic Research (KEPE).

1. The names of regions follow the nomenclature of territorial units for statistics (NUTS II) of Eurostat. The translation of these names to English is Attiki: Attica; Kentriki Makedonia: Central Macedonia; Anatoliki Makedonia-Thraki: Eastern Macedonia and Thrace; Thessalia: Thessaly; Dytiki Makedonia: Western Macedonia; Sterea Ellada: Central Greece; Ipeiros: Epirus; Ionia Nisia: Ionian Islands; Peloponnisos: Peloponnesus; Dytiki Ellada: Western Greece; Kriti: Crete; Voreio Aigaio: North Aegean; Notio Aigaio: South Aegean.

FIGURE 1

Regional per capita GDP inequality in Greece in relation to Attiki, 2000-2014

Legend:
- Anatoliki Makedonia-Thraki
- Ipeiros
- Dytiki Ellada
- Thessalia
- Kentriki Makedonia
- Voreio Aigaio
- Peloponnisos
- Kriti
- Sterea Ellada
- Ionia Nisia
- Dytiki Makedonia
- Notio Aigaio

Note: Regions are listed in descending order according to their per capita GDP inequality from Attiki in 2014.

2.2. Intertemporal evolution of per capita GDP dispersion (σ convergence)

The measures of regional dispersion of the GDP per capita are calculated at the national level. They refer to the standard deviation, the (unweighted) coefficient of variation and the population-weighted coefficient of variation (Williamson index). More specifically, the measure of standard deviation σ is calculated as follows:

$$\sigma = \sqrt{\sum_i \frac{\left[\log(y_i) - \log(\bar{y}_u)\right]^2}{n}}, \qquad (2)$$

where $\log(y_i)$ and $\log(\bar{y}_u)$ are the logarithms of the per capita gross product of region i and of the (unweighted) average GDP per capita across regions, and n is the number of regions. The standard deviation takes its minimum value (zero) when the per capita gross product of all regions is the same (absolute equality) and its maximum value when the GDP is concentrated in a single region (absolute inequality).

The coefficient of variation is calculated as the ratio of the standard deviation to the average value of GDP per capita:

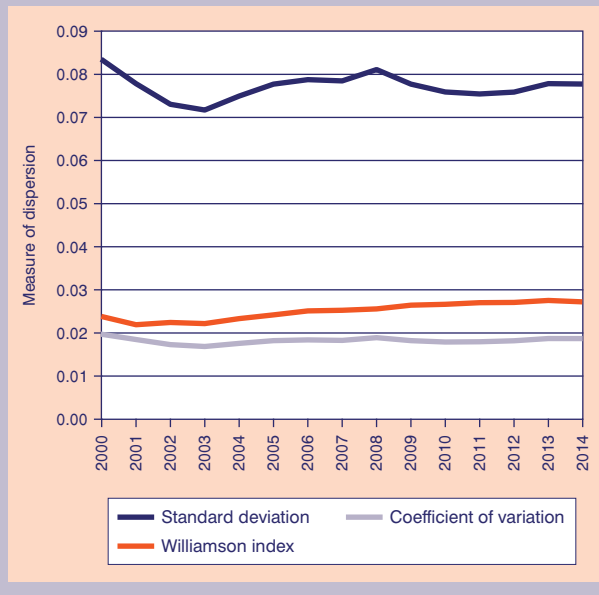$$CV_u = \frac{\sqrt{\sum_i \frac{\left[\log(y_i) - \log(\bar{y}_u)\right]^2}{n}}}{\bar{y}_u}. \qquad (3)$$

The coefficient of variation ranges from zero (in the case of absolute equality) to $\sqrt{n-1}$ (in the case of absolute inequality). The Williamson index refers to the coefficient of variation weighted by the share of each region to the national population, namely:

$$CV_w = \frac{\sqrt{\sum_i \left[\log(y_i) - \log(\bar{y})\right]^2 \frac{p_i}{P}}}{\bar{y}}, \qquad (4)$$

where $\log(\bar{y})$ is the logarithm of the national average GDP per capita, p_i is the size of the population of region i and P is the national population size. The weighted coefficient of variation ranges from zero (in the case of absolute equality) to $\sqrt{(P-p_i)/p_i}$, where region i has all the GDP (in the case of absolute inequality).

Figure 2 shows that the σ convergence among regions is either non-existent or inconsiderable, as the measures of dispersion have not substantially changed during the period 2000-2014. Based on the measures of standard deviation and coefficient of variation, the dispersion of per capita GDP across regions reduced only to a very small extent during the crisis period (2008-2014). According to the Williamson index, the dispersion of per capita GDP across regions increased during the period 2000-2008 and thereafter –during the crisis period– remained stable. These results demonstrate the highly persistent heterogeneity among Greek regions over time, in terms of the per capita

FIGURE 2
Intertemporal evolution of per capita GDP dispersion (σ convergence) among the Greek regions, 2000-2014

Legend: Standard deviation — Coefficient of variation — Williamson index

FIGURE 3
Inequality indices of Gini (unweighted and population weighted) and Theil, 2000-2014

Legend: Unweighted Gini index — Theil index — Weighted Gini index

GDP dispersion, rejecting the hypothesis of interregional convergence.

2.3. Gini and Theil indices

Two indices which have been widely used in the international literature to measure regional inequalities are those of Gini and Theil. The Gini index here denotes the standardized mean value of the absolute differences in per capita GDP between all regions within the country, namely:
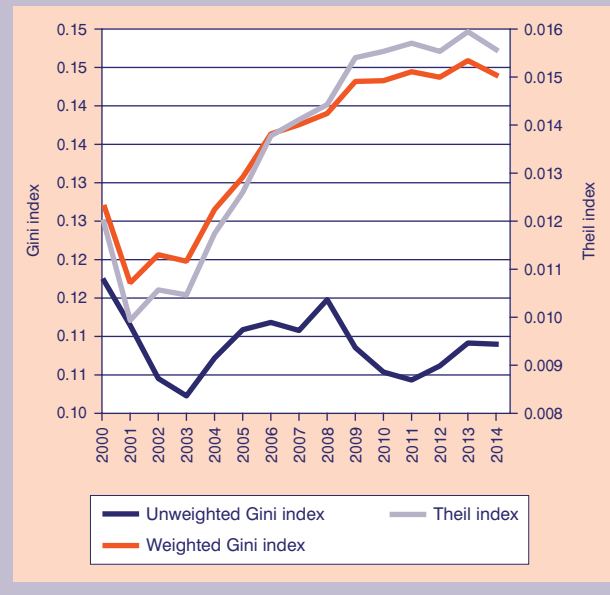
$$G_u = \frac{1}{2\,\bar{y}_u}\,\frac{1}{n(n-1)}\sum_i^n\sum_j^n |y_i - y_j|, \qquad (5)$$

where y_i and y_j are the per capita GDP of regions i and j, respectively, n is the number of regions and $\bar{y}_u$ is the unweighted average per capita GDP across all regions. The absolute equality between regions is expressed by zero and the absolute inequality by unity. Alternatively, the Gini index can be expressed with the weighting of the absolute differences in per capita GDP using the shares of regions to the national population, as follows:

$$G_w = \frac{1}{2\,\bar{y}}\sum_i^n\sum_j^n |y_i - y_j|\frac{p_i\,p_j}{P^2}, \qquad (6)$$

where $\bar{y}$ is the national average per capita GDP, p_i and p_j are the population sizes of regions i and j, respec-

tively, and P is the national population size. The value of the weighted Gini index ranges from zero (in the case of absolute equality) to $1-(p_i/P)$, where region i has all the GDP (in the case of absolute inequality).

The Theil index constitutes an entropy measure of regional inequalities and is given as follows:

$$T = \sum_i x_i \log\!\left(\frac{x_i}{q_i}\right), \qquad (7)$$

where x_i is the GDP share of region i and q_i is the population share of region i to the national total. The value of the Theil index ranges from zero (in the case of absolute equality, where the per capita GDP is equal for all regions, namely, the GDP of regions is proportional to their population size) to $\log(P/p_i)$, where region i has all the GDP (in the case of absolute inequality).

Figure 3 illustrates the intertemporal evolution of the (unweighted and weighted) Gini index and Theil index. The value of the unweighted Gini index presents small fluctuations, without significant changes during the period 2000-2014. However, the values of the weighted Gini index and Theil index, which take into account the population distribution, present a considerable increase over time. Specifically, the value of the weighted Gini index rose by 25% (from 11.7% to 14.6%) and the value of the Theil index rose by 60% (from 1% to 1.6%) during the period 2001-2013. The value of both indices shows a small reduction during 2013-2014.

The growth of interregional inequalities can be largely attributed to the increased concentration of GDP in the core region of Attiki, although the population of the specific region did not substantially change during the study period.

2.4. Dynamic measure of interregional inequality (β convergence)

Figure 4 diagrammatically shows the (absolute or unconditional) convergence β, namely, the rate with which the less developed regions catch up to the more developed ones. Assuming that $\gamma_{i,t,t+T} \equiv \log(y_{i,t+T}/y_{i,t})/T$

is the average annual rate of GDP growth of region i between the initial reference year $t = 2000$ and the final reference year $t + T = 2014$, where $T + 1 = 15$ is the number of years included in the analysis period, and $\log(y_{i,t})$ is the logarithm of per capita GDP of region i in year t, then, the variable $\gamma_{i,t,t+T}$ is given with the following linear regression:

$$\gamma_{i,t,t+T} = a - b\log(y_{i,t}) + \varepsilon_{i,t}. \qquad (8)$$

Figure 4 verifies the negative sign of the gradient of equation (8) ($b = -0.011$), suggesting that the regions with lower income are developing faster than the regions with higher income, relative to the initial year. The average speed of convergence β, which is obtained from the equation $b = (1 - e^{-\beta T})/T$, is positive, i.e. 1.2% per year, but very low (consistent with other similar studies concerning earlier time periods, e.g., Panteladis and Tsiapa [2012]) and statistically non-significant during the study period 2000-2014. The regions with the lowest per capita GDP, i.e. Voreio Aigaio and

Dytiki Ellada, present increased rates of convergence. Nevertheless, there are regions which lie away from the best-fit line and, hence, they are differentiated from the supposed β convergence process. In particular, the position of Attiki in Figure 4 denotes that it is a region which has both a high per capita GDP and an increased growth rate in comparison to other regions. Based on the estimated speed of convergence, it is considered that a number of $t_{0.5} = \ln2/\beta = 57$ years is required to eliminate the income gap between Greek regions by half. This outcome about the very low convergence rate and the inability of the less developed regions to catch up to the more developed ones is consistent with the results of the indices presented before, depicting the strong persistence of interregional inequalities in Greece.

3. Composite index of regional well-being

The composite well-being index (CWI) takes into account more than a single indicator to represent the living conditions, the welfare and the development prospects of a region. Hence, it can be regarded as providing us with a more complete view of the performance of regions. Based on the available dataset, other empirical studies and international standards (Petrakos and Psycharis, 2004; OECD, 2016), the CWI is constructed as a linear combination (bearing equal weights) of eight selected regional indicators. These indicators denote living conditions (income, employment and unemployment), quality of life (education and life expectancy) and welfare and development prospects (proportion of young persons, proportion of aged persons and productivity).

FIGURE 4

Illustration of β convergence among the Greek regions, 2000-2014
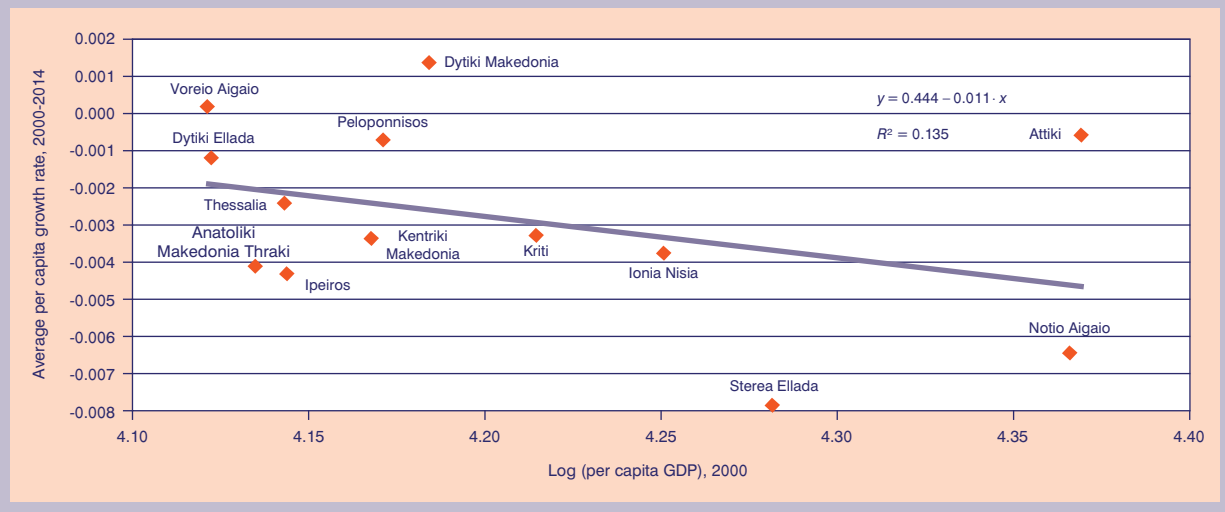
It is noted that while the variables of employment, unemployment, educational attainment and population composition (proportions of young and aged persons) are available up to 2016, the variable of life expectancy is available up to 2015 and the variables of income and regional GDP (to calculate productivity) are available up to 2014. For this reason, the CWI is calculated here for the time period spanning 2000-2014, for which there are data available to account for all indicators. Specifically, the indicators used to construct the CWI are defined as follows:

1) Average personal disposable income: the ratio of the total disposable income to the population of each region (as obtained from the National Accounts of the Hellenic Statistical Authority-ELSTAT at Regional NUTS-II level).

2) Employment rate: the ratio of the number of employed persons to the 15-64 year-old population of each region, expressed as proportion (%) (according to Eurostat).

3) Unemployment rate: the ratio of the number of unemployed persons to the economically active population of each region, expressed as proportion (%) (according to Eurostat).

4) Youth proportion: the ratio of the number of young persons (15-29 years old) to the total population of each region, expressed as proportion (%) (based on the quarterly Labor Force Surveys of ELSTAT).

5) Aged proportion: the ratio of the number of aged persons (above 65 years old) to the total population of each region, expressed as proportion (%) (based on the quarterly Labor Force Surveys of ELSTAT).

6) Life expectancy: the mean number of years expected to be lived by a person less than one year old in a region, expressed in years (according to Eurostat).

7) Educational attainment index: the ratio of the number of tertiary education graduates to the 25-64 year-old population of each region, expressed as proportion (%) (according to Eurostat).

8) Productivity: the ratio of the gross product to the number of employed persons in each region, in euros per worker (based on the National Accounts at Regional NUTS-II level and the quarterly Labor Force Surveys of ELSTAT).

Each of these indicators is standardized in order to be used in the construction of the CWI. More specifically, the minimum and maximum value of each indicator

is calculated in each year. In case that a variable (income, employment, educational attainment, life expectancy, youth proportion, productivity) contributes positively to the CWI, the standardization is carried out as follows:

$$\hat{x}_i = \left(\frac{x_i - \min(x)}{\max(x) - \min(x)} \right) \times 10 . \qquad (9)$$

In case that a variable (unemployment, aged proportion) contributes negatively to the CWI, the standardization is carried out as follows:

$$\breve{x}_i = \left(\frac{\max(x) - x_i}{\max(x) - \min(x)} \right) \times 10 . \qquad (10)$$

Therefore, the lower the value of the CWI of a region toward zero (minimum value), the worse the living conditions and the welfare and development prospects are for this region. Conversely, the higher the value of the CWI of a region toward 10 (maximum value), the better the living conditions and the welfare and development prospects are for this region.

Figure 5 shows the values of the eight indicators used to construct the CWI for each of the 13 Greek regions in 2000, 2008 and 2014. Figure 6 illustrates the temporal evolution of the CWI of the Greek regions during the period 2000-2014. The region of Attiki possessed the highest CWI value up to 2013, having a descending trend during the crisis period. In 2014, the region of Notio Aigaio attained the highest CWI value. The CWI of this island region showed a remarkable upturn since 2010 (Figure 5). On the contrary, the CWI of the region of Kriti, which possesses the third highest value, has been adversely affected by the crisis.

During 2000-2014, the region of Voreio Aigaio increased its CWI by 55%, while the regions of Kentriki Makedonia and Dytiki Ellada showed the largest decrease in CWI (by -33% and -31%, respectively). Especially during the crisis period (2008-2014), the regions of Kentriki Makedonia and Attiki showed the largest reductions in CWI (by -32% and -29%, respectively), with the regions of Sterea Ellada and Thessalia to follow in order (both having a reduction of -27%). Hence, the latter regions can be considered as being the least resilient to the economic crisis. On the contrary, during the crisis period, the region of Dytiki Makedonia showed the largest increase of the CWI (by 32%), with the regions of Notio Aigaio and Ionia Nisia to follow in order (with an increase equal to 20% and 11%, respectively). Thus, the specific regions can be regarded as being the most resilient to the economic crisis.

FIGURE 5

Individual indices of well-being for the Greek regions in (a) 2000, (b) 2008 and (c) 2014
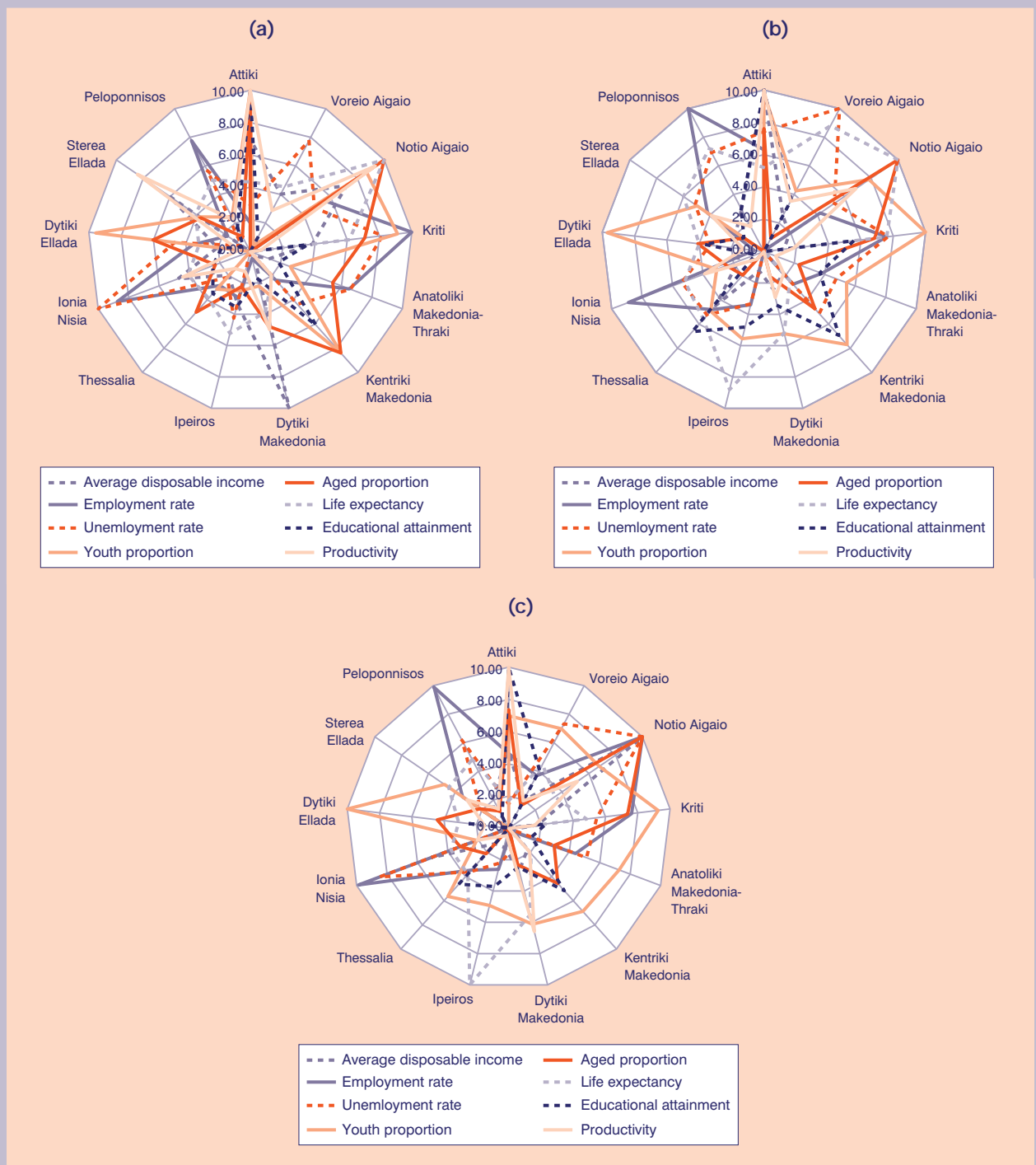
Based on the CWI results, regional inequalities can be expressed by the logarithm of the ratio of the CWI of region i (CWI_i) to the CWI of Attiki (CWI_0), namely:

$$D_i' = \log\left(\frac{CWI_i}{CWI_0}\right). \qquad (11)$$

Figure 7 illustrates that the regions of Notio Aigaio and Kriti steadily present the smallest inequality in relation to Attiki (the log difference does not fall beyond -10% in 2014), while the regions of Sterea Ellada, Anatoliki Makedonia-Thraki and Dytiki Ellada show the largest inequality in relation to Attiki (-34% in 2014).

FIGURE 6

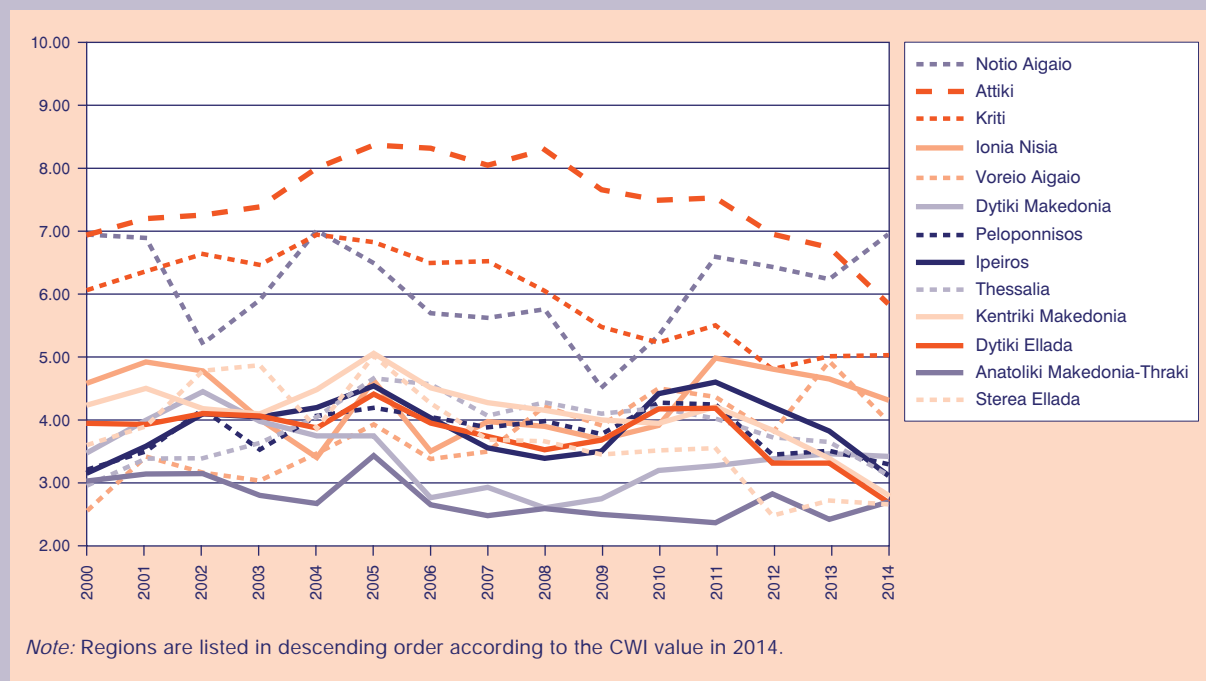**Composite well-being index (CWI) of the Greek regions, 2000-2014**

Note: Regions are listed in descending order according to the CWI value in 2014.

FIGURE 7

Regional inequalities in Greece in relation to the CWI of Attiki, 2000-2014

Note: Regions are listed in ascending order according to their discrepancy from the CWI of Attiki in 2014.
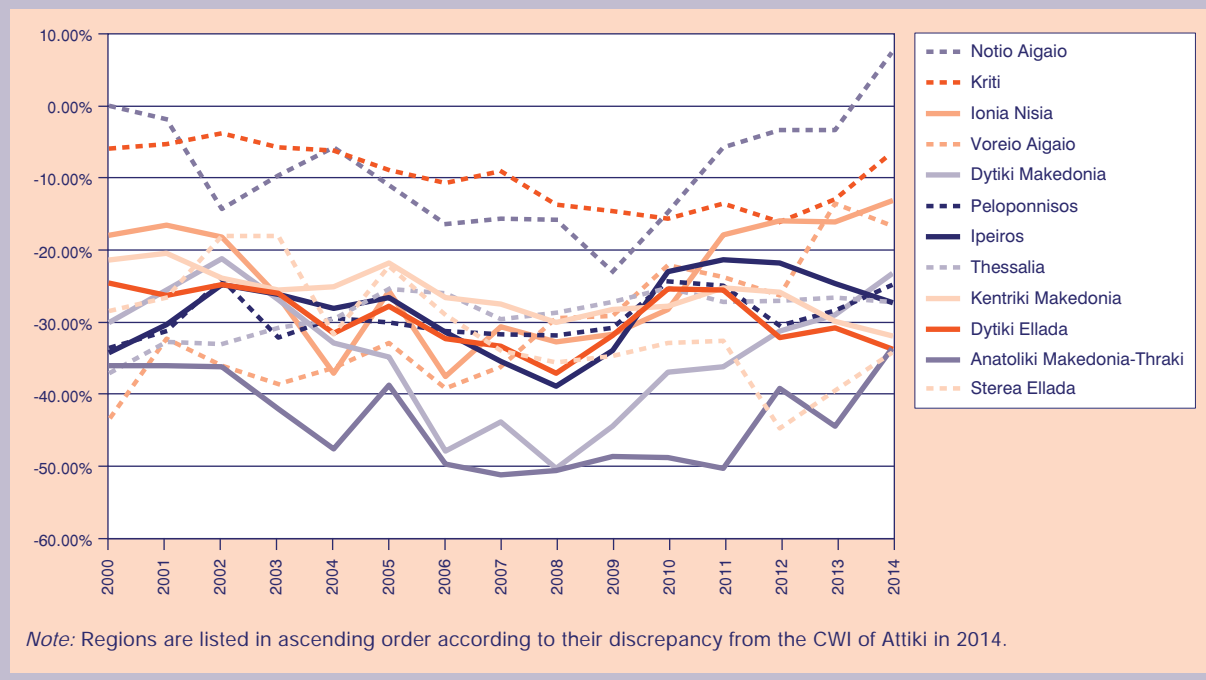
4. Conclusions

This article presented a series of indices of inequality at the regional (NUTS-II) level in order to depict the magnitude and temporal evolution of economic and social discrepancies among the Greek regions. The results of these indices make clear the persistency of interregional inequalities in the country. The regional inequalities signify structural problems and inconsistencies against the balanced and efficient use of re-

gional production factors both before and after the outbreak of the crisis (see also Caraveli and Tsionas, 2012; Papaioannou *et al.*, 2017).

Specifically, all peripheral regions are found to significantly and persistently lag behind the core region of Attiki, in per capita GDP terms. At the same time, the less developed regions catch up to the more developed ones only at a very small rate (1.2% per year during 2000-2014). Nonetheless, the construction of a composite well-being index (CWI) suggests the downward trend of Attiki during the crisis period and the gradual reduction of inequalities in relation to Attiki, on average, from -33% in 2008 to -22% in 2014. In particular, the more populated regions of Attiki and Kentriki Makedonia present the lowest resilience to the crisis, in terms of well-being conditions. Conversely, the region of Dytiki Makedonia, together with the island regions of Notio Aigaio and Ionia Nisia, demonstrate the highest resilience to the crisis, in terms of well-being conditions.

It is noted that the CWI could also be used to provide a medium-term monitoring of regional inequalities, encompassing only variables updated (and seasonally adjusted) quarterly, e.g., those originating from the quarterly Labor Force Surveys, such as the youth and aged proportions, the full-time and part-time employment rates, the long-term and short-term unemployment rates, and educational attainment indices. However, the CWI results must be interpreted with caution, taking into account the equal weighting of constituent indicators and the sensitivity of CWI values to the definition of each constituent indicator. Another possible shortcoming of the CWI to be addressed in future re-

search refers to the fact that some constituent indicators may be significantly overlapped with each other, such as the employment and unemployment rates, and the average disposable income and productivity. Finally, intraregional (within-region) inequalities could be investigated, taking into consideration the limitations in data availability concerning several variables at a higher (e.g., prefecture, municipal etc) level of spatial resolution.

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Analysis of health expenditure in Greece during the period 2009-2015

Roxani Karagiannis*

1. Introduction

The global interest in health expenditure can be explained by the rapid increase in health spending during the last fifteen years. The nature of health services and the need to ensure the optimum level of the population's health constitute this global debate. According to Gerdtham and Jonsson (2000), health expenditures reflect the demand of each country's health care services. As a result, governments emphasize the cost containment and cost effectiveness of health spending, taking into consideration that the highest portion of expenditures are financed by the general government through taxes or/and compulsory health insurance.

De la Maisonneuve and Oliveira Martins (2013) show that without structural reforms to contain health-related costs, public spending on health care for OECD countries would increase on average from 6% of GDP in 2010, to 9% in 2030, and to 14% in 2060. The demographic, socio-economic, medical and epidemiological factors as well as the increased volume and value of health care services are the main factors that influence the size of health care expenditures. The improvement in life expectancy and the phenomenon of population ageing increased the number of elderly people, the medical care of whom requires more health resources and long-term care. The continuous development and expansion of medical and therapeutic protocols and the diffusion of biotechnology has increased the cost of provided health care services, despite the improvement in the diagnosis and treatment of diseases. The expansion of chronic and degenerative diseases and the long-term, and sometime ineffective, therapies require more and more health care resources. The universal insurance coverage, the increased per capita disposable income and the modern lifestyle of the population led to overconsumption of health services, rising private out-of-pocket payments. Furthermore, the supplier-induced demand, the moral hazard, the improper use of biotechnology, the over-prescription of drugs and laboratory and imaging services, the over-supply of physicians and the waste in the financial resources of health care facilities increased the level of health expenditures over time (Marino *et al.*, 2017; de la Maisonneuve *et al.*, 2016).

In order to cope with growing health spending, authorities have implemented a series of structural reforms concerning the demand- and supply-side of health care services aiming to the productive and efficient use of available health system resources. The demand-side reforms, such as (a) a co-payment for outpatients for medical and dental services, pharmaceutical products, laboratory and imaging services and (b) special taxation on goods which are responsible for the over-consumption of health care services are aimed at the reduction of the volume of health care services and the release of resources which can be used for other health needs and priorities. The supply-side reforms, such as (a) global budgets,[1] (b) capitation reimbursement system, (c) barriers to entry for new physicians/doctors, (d) health technology assessment, (e) control of public pharmaceutical spending and e-prescription, (f) pricing control of health care services provided, (g) reduction of wholesale and retail traders' profit in the supply chain and (h) the revision of the negative and positive list[2] aimed at the reduction of the volume of health care services provided.

Therefore, health care expenditures are a key discussion issue, especially in period of economic recession, as experienced by our country. The main target of the Economic Adjustment Program from May 2010 up to the latest revision in June 2017 is the rationalization of health care spending, focusing on the reform of the health care system and the cost containment of the public pharmaceutical expenditure. The main purpose of this article is to analyze the health care expenditure evolution in Greece during the period 2009-2015 from the side of the financing agents/schemes, the various health care activities and providers. The analysis is based on the revised national health expenditure data, published by the Hellenic Statistical Authority (ELSTAT) in April 2017 according to the System of Health Accounts of the Organization for Economic Co-operation and Development (OECD, 2011).

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* Senior Research Fellow, Centre of Planning and Economic Research (KEPE).

1. A global budget provides a fixed amount of funding for a fixed period of time (typically one year) for a specified population. The main objective is to constrain the amount a hospital can spend in order to limit the total amount of money spent on the health care system.

2. Pharmaceuticals classified in the negative list may not be prescribed at the expense of the statutory health insurance. On the other hand, pharmaceuticals classified in the positive list may be prescribed by practitioners affiliated with the health service.

2. The evolution of health care expenditure

In Greece, total health expenditures, at current prices, exhibited a significant reduction after 2009, reaching 8.38% of GDP in 2015, relative to 9.76% in 2009. More specifically, total health expenditures reached their highest value (€23,615 million) in 2008, relative to €13,459 million in 2002, while during the economic recession expenditures decreased gradually to €14,732 million in 2015 (Figure 1). In 2015, the total health expenditures increased slightly by €600 million for first time since 2009. The expenditures of the general government[3] and the private sector[4] followed the trend of total health expenditures. The general government spending increased from €8,137 million in 2002 to €15,412 million in 2009 and decreased to €8,407 million in 2015, reaching the level of 2002. The private/voluntary expenditures increased from €5,322 million in 2002 to €9,459 million in 2008, but decreased to €5,765 million in 2015. The private spending presented low shifts after 2012 relative to the general government expenditures.

The growth rates[5] of total, general government and private health care expenditures follow the same trend until 2008 (Figure 2). Afterwards, the general government and private expenditure rates present opposite shifts. During the period 2002-2009, the total health expenditures exhibited an average annual growth rate of 4.42%, which was followed by an average annual reduction of 5.97% during the period 2009-2015. The general government and private/voluntary expenditures decreased, on average, by 8.11% and 2.42%,

FIGURE 1
Evolution of health expenditures at current prices, 2002-2015 (in million euros)
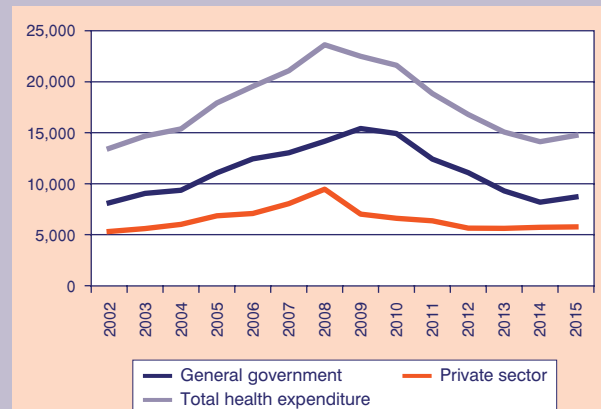
Source: ELSTAT (2017), OECD Health Data Statistics (2017).

FIGURE 2
Annual growth rates (%) of health expenditure at real prices, 2002-2015
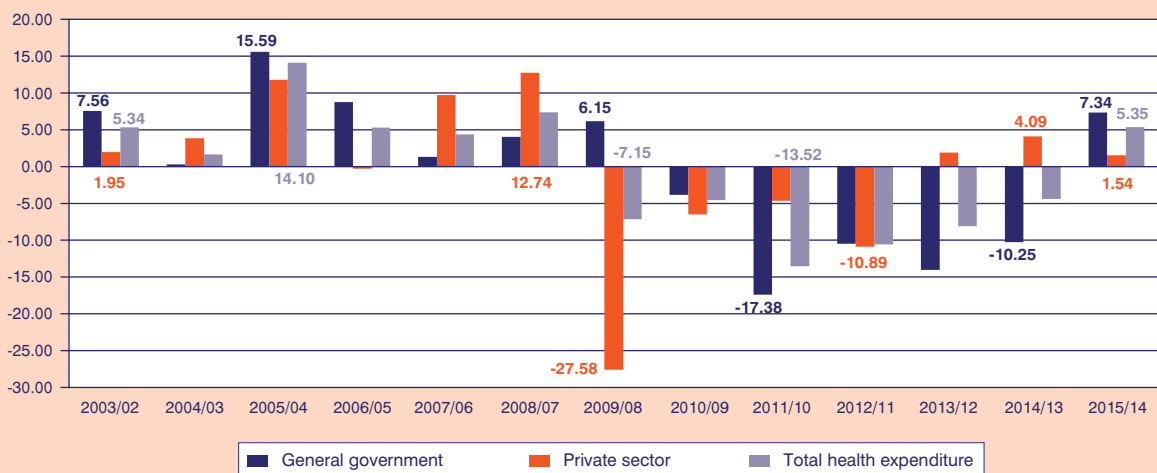
Source: ELSTAT (2017), OECD Health Data Statistics (2017), Author's estimations.

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3. General government health expenditure includes central government and social (compulsory) health insurance (OKA) spending.

4. The term of private or public expenditures refers to the financial institution and not to the ownership status of the heath care provider. Private health expenditure includes voluntary health insurance and household out-of-pocket payments.

5. Growth rates of health expenditures are adjusted using GDP deflator (100=2010) (OECD, 2017).

Evolution of health expenditure as a share of GDP at current prices, 2002-2015
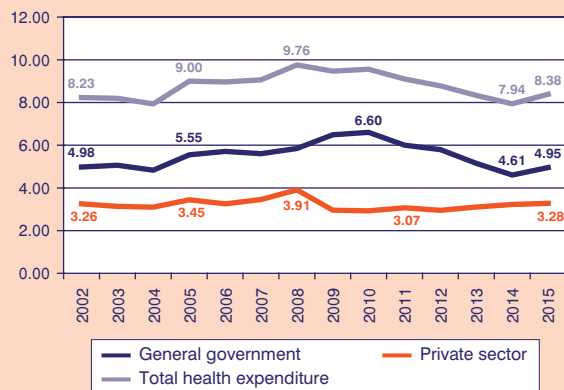
Source: ELSTAT (2017), OECD Health Data Statistics (2017).

respectively, after 2009 relative to a 6.24% and 1.74% increase during the period 2002-2009. During the period of economic recession, the general government spending reduced gradually from -3.84% in 2010 to -10.25% in 2014, but increased by 7.34% in 2015. The highest reduction (-17.38%) was observed in 2011, the first year of the implementation of the Economic Adjustment Program for the health care system in Greece. In addition, private/voluntary expenditures reduced from -6.49% in 2010 to -10.89% in 2012. The private/voluntary expenditures recorded an upward trend during the period 2013-2015, with the highest value of 4.09% in 2014.

The total health care expenditures as a share of GDP, at current prices, amounted to 8.23% in 2002, 9.76% in 2008, 7.94% in 2014 and 8.38% in 2015 (Figure 3). The general government spending ranged from 4.98% in 2002 to 6.60% in 2010 and 4.95% in 2015, while private/voluntary expenditures increased from 3.26% in 2002 to 3.91% in 2008, but decreased to 3.28% in 2015. We can observe that the size of total health expenditures as a share of GDP have reached the level of 2002 due to the implementation of structural reforms, while the general government spending exhibited the highest reduction (average annual negative rate 4.15%) in contrast to a positive rate (+1.80%) for the private/voluntary expenditures.

According to the literature, the size of total health expenditures may be influenced by social and economic factors. Newhouse (1987), Leu (1986), Brown (1987), Parkin *et al.* (1987) and Gerdtham *et al.* (1992) find an income elasticity of demand for health care services greater than unity and they argued that per capita income is positively related to health expenditure

growth. On the other side, Barros (1998), Di Matteo and Di Matteo (1998), Giannoni and Hitiris (2002), Koening *et al.* (2003), Di Matteo (2005) and Baltagi and Moscone (2010) found an income elasticity with values between zero and one, indicating that health care services are a necessity rather than a luxury good (Martin Martin *et al.,* 2011).

The results of the literature do not offer sufficient evidence to consider population ageing to be a significant variable of health care expenditure. Leu (1986), Gerdtham *et al.* (1992) and Hitiris and Posnett (1992) argued that ageing populations exhibit a significant influence on health expenditures. Zweifel *et al.,* (1999), Felder *et al.* (2000), Breyer and Felder (2006) and Werblow *et al.* (2007) maintained that closeness to death, rather than population ageing, is the variable that explains the increase in health care expenditures.

Weisbord (1991) concluded that advances in medical technology, though sometimes making existing procedures cheaper, generally increase demand and supply of health care services, resulting in increased health expenditures. Reinhardt (2003) finds that apart from the health care technologies, the asymmetry of health care market power, favorable to supply rather to demand, and the scarcity of health care professionals are the true drivers of health care expenditures' growth rather than the ageing of the population.

Evans (1974), Rice (1983), McQuire *et al.* (1993) argued that the supplier-induced demand is an explanation for the increase in health expenditures. Pauly (1968) and Weisbord (1991) concluded that increases in compulsory health insurance can influence the size of health expenditures through both the demand and the supply of health care. The OECD (1996) suggested that the high portion of the general government funding of health expenditures can increase public debt while compulsory insurance contributes to moral hazard.

Furthermore, the development of political and fiscal crises and the implementation of structural policies at national or/and regional levels tends to influence public health care expenditures (van Gool and Pearson, 2014; Braendle and Colombier, 2016). In Greece, a significant share of the reduction of total health care expenditures resulted from the fiscal adjustment program through the implementation of structural reforms after May 2010 and its subsequent revision. The size of total health care expenditures as a share of GDP depends on changes in both health spending and in the economy as a whole. In Greece, the economic crisis has contributed to a significant reduction of GDP after

FIGURE 4
Current total health spending and GDP, 2002-2015 (in million euros)
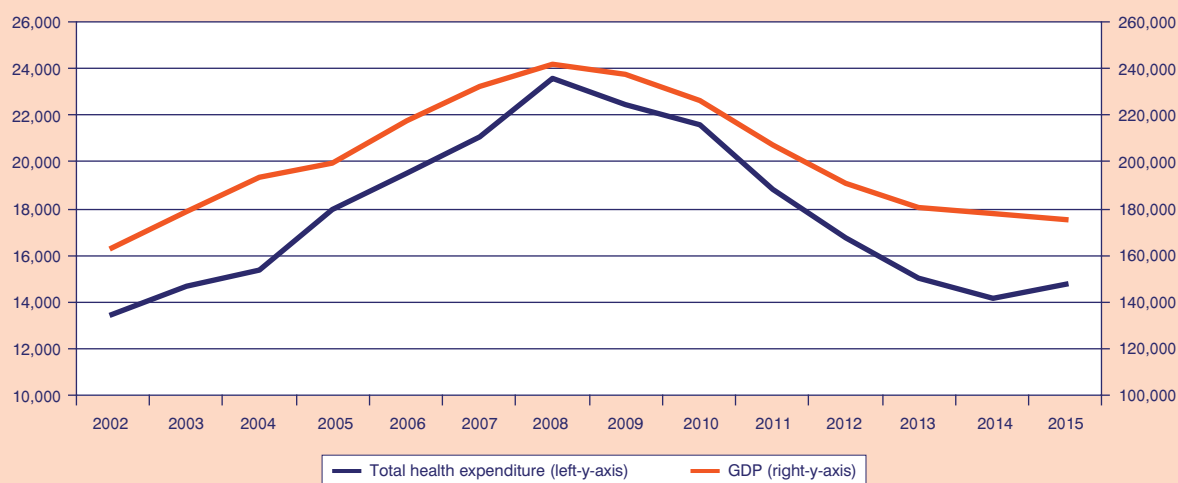
Source: OECD Health Data Statistics (2017).

2009 (Figure 4). Greece saw health spending growth decline much more than GDP, resulting in a rapidly decreasing health expenditure to GDP ratio from 9.47% in 2009 to 7.94% in 2014.

3. The financing of the health care system

Figure 5 presents the proportional distribution of total health expenditures by kind of financing agents/ schemes at current prices during the period 2009-2015. The various health activities, such as curative,

rehabilitative and long-term care services, ancillary services, medical goods dispensed to outpatients, prevention care and health system administration, are financed by the central government, the compulsory health insurance, households and private insurance companies. During the first year of the economic crisis, the main financial burden of the health care system was shouldered by compulsory health insurance funds (41.34% of total health expenditure or €9,297 million) and households' out-of-pocket payments (29.31% or €6,592 million) followed by central

FIGURE 5
Distribution (%) of health expenditure by kind of financing agents/schemes at current prices, 2009-2015

FIGURE 5
Distribution (%) of health expenditure by kind of financing agents/schemes at current prices, 2009-2015

Legend:
- Central government
- Compulsory health insurance
- Voluntary health insurance
- Household out-of-pocket payment
- Other agents/schemes
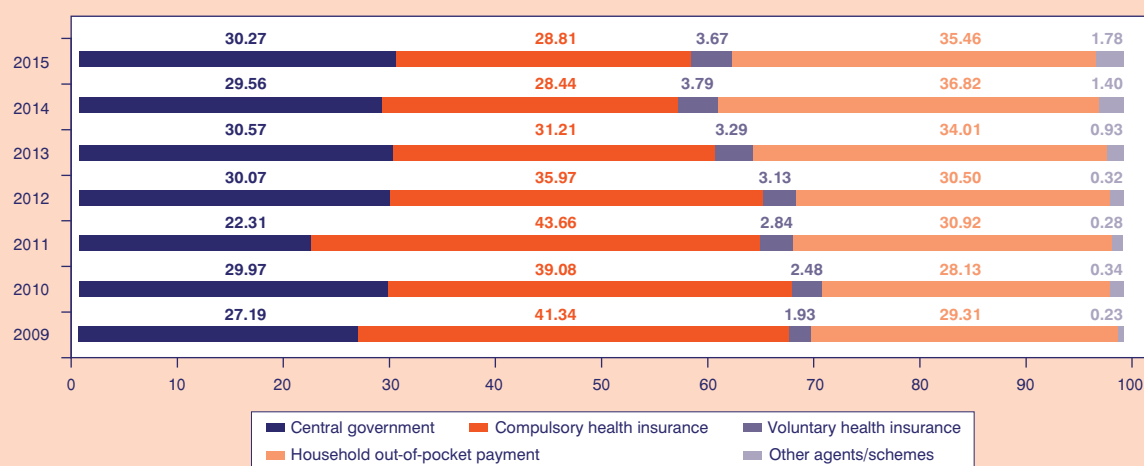
Source: ELSTAT (2017), Author's estimations.

	2010/09	2011/10	2012/11	2013/12	2014/13	2015/14	2015/09	Average annual rates
Central government	5.18	-35.62	20.54	-6.59	-7.56	7.90	-23.95	-2.69
Compulsory health insurance (OKA)	-9.77	-3.40	-26.32	-20.27	-12.89	6.76	-52.38	-10.98
Total general government expenditure	-3.84	-17.38	-10.47	-14.04	-10.25	7.34	-41.10	-8.11
Voluntary health insurance	22.88	-1.25	-1.21	-3.57	10.10	2.25	30.13	4.87
Household out-of-pocket payment	-8.42	-4.94	-11.78	2.45	3.51	1.47	-17.35	-2.95
Total voluntary health care payments	-6.49	-4.64	-10.89	1.89	4.09	1.54	-14.42	-2.42
Other agents/schemes	38.13	-28.92	2.46	166.67	44.96	33.54	419.34	42.81
Total health expenditure	-4.57	-13.52	-10.58	-8.10	-4.39	5.35	-31.69	-5.97

Source: ELSTAT (2017), Author's estimations.

government spending (27.19% or €6,115 million). In 2015, the financing share of compulsory health insurance reduced to 28.81% (€4,245 million), while those of the out-of-pocket payments increased to 35.46% (€5,224 million), the central government to 30.27% (€4,459 million), the voluntary health insurance to 3.67% (€541 million) and the other agents to 1.78% (€262 million).

The implementation of structural reforms in the health sector, in accordance to the cost containment of health spending, has resulted in the highest reduction of compulsory health insurance expenditures relative to the other financing agents of health care services (Table 1). More specifically, the financing of the compulsory health insurance agents decreased by 52.38%, narrowing also their share to total health expenditures by 12.53 percentage points during the period 2009-2015. The financing of central government and household out-of-pocket payments decreased by 23.59% and 17.35%, respectively. However, their share to total health expenditures increased by 3.08 and 6.15 percentage points. The financing of voluntary health insurance schemes increased significantly by 30.13% with a corresponding increase in the share of total expenditures by 1.74 percentage points. During the same period, the financing of other agents and more specifically the code HF.4 increased by 419.34% due to the incoming European funds from ESPA programs. The central government and compulsory health insurance spending increased by 7.90% and 6.76%, respectively, in period 2014-2015, after the significant reduction in health care expenditures during the first years of the economic crisis.

4. The financing of health care activities

Total health care expenditures, regardless of the financing agent, are allocated to inpatient and outpatient curative (public and private) and rehabilitative care; long-term care; ancillary services, such as laboratory and imaging services and patient transportation; medical goods dispensed to outpatients, such as pharmaceuticals and therapeutic appliances and other medical durable goods; preventive care and governance and health system administration.

Table 2 and Figure 7 show that the two main leaders of total health expenditures are inpatient and outpatient care, amounting to €5,524.61 million for the general government and €3,491.61 million for households in 2015, as well as the medical goods dispensed to outpatients, amounting to €2,253.23 million and €1,915.84 million, respectively, with inpatient care occupying the first position. The ancillary services occupied the third position with €305.12 million for the general government and €281.31 million for households.

TABLE 2 Health expenditure by kind of health care services/activities at current prices, 2009-2015 (in million euros)

	2009	2010	2011	2012	2013	2014	2015
				General government			
Curative care	9,001.11	8,649.65	6,634.26	6,438.96	5,584.09	4,904.33	5,525.61
Rehabilitative care	11.51	9.58	9.58	0.00	0.00	65.58	77.98
Long-term health care	86.21	116.33	66.75	78.84	84.35	51.52	62.90
Ancillary services	519.69	473.09	490.55	359.97	489.14	368.09	305.12
Medical goods	5,159.30	5,115.98	4,684.69	3,693.76	2,648.22	2,212.14	2,253.23
Preventive care	273.87	271.15	218.49	175.58	166.99	209.89	174.89
Governance and health system administration	360.50	285.08	321.01	335.67	330.13	383.19	304.78
Total	**15,412.18**	**14,920.86**	**12,425.32**	**11,082.77**	**9,302.92**	**8,194.72**	**8,704.51**
				Voluntary health care payments			
Curative care	5,054.86	4,650.93	4,386.28	3,686.88	3,409.27	3,466.00	3,491.61
Rehabilitative care	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Long-term health care	7.53	9.76	10.72	14.34	7.34	7.34	5.14
Ancillary services	433.96	383.71	338.71	326.23	343.94	298.29	281.31
Medical goods	1,501.28	1,542.41	1,543.45	1,552.71	1,784.94	1,896.79	1,915.84
Preventive care	3.70	3.70	3.70	3.51	3.51	3.27	18.00
Governance and health system administration	75.29	93.14	92.71	90.00	81.89	81.89	81.89
Total	**7,076.61**	**6,683.66**	**6,375.57**	**5,673.67**	**5,630.89**	**5,753.59**	**5,793.79**

Source: ELSTAT (2017).

General government expenditures, at real prices, reduced for all main categories of health care activities in 2009-2015, with the highest average annual reduction (-11.68%) recorded in pharmaceutical products and therapeutic appliances, due to the initial cost containment target that public pharmaceutical spending should not exceed 1.3% of GDP in 2014. The implementation of the revised pharmaceutical pricing policy, the increased use of generics, the revised negative and positive lists and the introduction of clawbacks[6] were the main structural reforms implemented for the achievement of the aforementioned target. The curative care services and the ancillary services exhibited an annual average negative growth 6.48% and 5.58%, respectively. During the same period, the private/voluntary health care payments for curative and ancillary care services fell annually by 5.10% and 6.05%, on average, respectively. On the other side, the expenditure for medical goods dispensed to outpatients increased annually by 5.06%, on average, indicating a burden shift from the general government to households due either to the expansion of the negative list of drugs or to the higher patient co-payments in certain categories of pharmaceutical products. We can observe in Figure 6 the continuous shrinkage of the general government health spending for curative care services and provision of medical goods for the whole period under consideration apart during the period

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6. Clawbacks refer to any money or benefits that have been given out but need to be returned from health care providers (such as private clinics, laboratory centers, pharmacies) due to special circumstances or events. Usually it works as an alternative policy for a reduction to prices of health care services and goods.

FIGURE 6

Annual growth rates (%) of health expenditure by kind of health care services/activities at real prices, 2009-2015

General government

Voluntary health care payments

Legend: 2010/09 | 2011/10 | 2012/11 | 2013/12 | 2014/13 | 2015/14

*Source:* ELSTAT (2017), Author's estimations.

2014-2015, when a rise by 13.86% and 2.93% at real prices, respectively, is recorded. Households' out-of-pocket payments for curative care and medical goods presented a continuous increase but with a diminishing growth rate after 2013.

Figure 7 presents the distribution of general government and household spending by kind of health care activities at current prices. The share of the general governments' spending for inpatient and outpatient curative care increased from 58.40% in 2009 to 63.48% in 2015, while the share of medical goods and therapeutic appliances provided to outpatients decreased

from 33.48% to 25.89%, respectively. On the other hand, households seem to allocate a greater share for medical goods and appliances (33.07% in 2015 relative to 21.21% in 2009) and a lower share for curative care (60.26% relative to 71.43%, respectively) and ancillary services (4.86% relative to 6.13%, respectively). The implementation of structural reforms resulted in the reallocation of expenditures' share between the general government and households. Households appear to cover the gap in public pharmaceutical spending while the general government seems to finance a higher share of outpatient and ancillary care for the population.

FIGURE 7

Distribution (%) of health expenditure by kind of health care services/activities at current prices, 2009-2015

Source: ELSTAT (2017), Author's estimations.
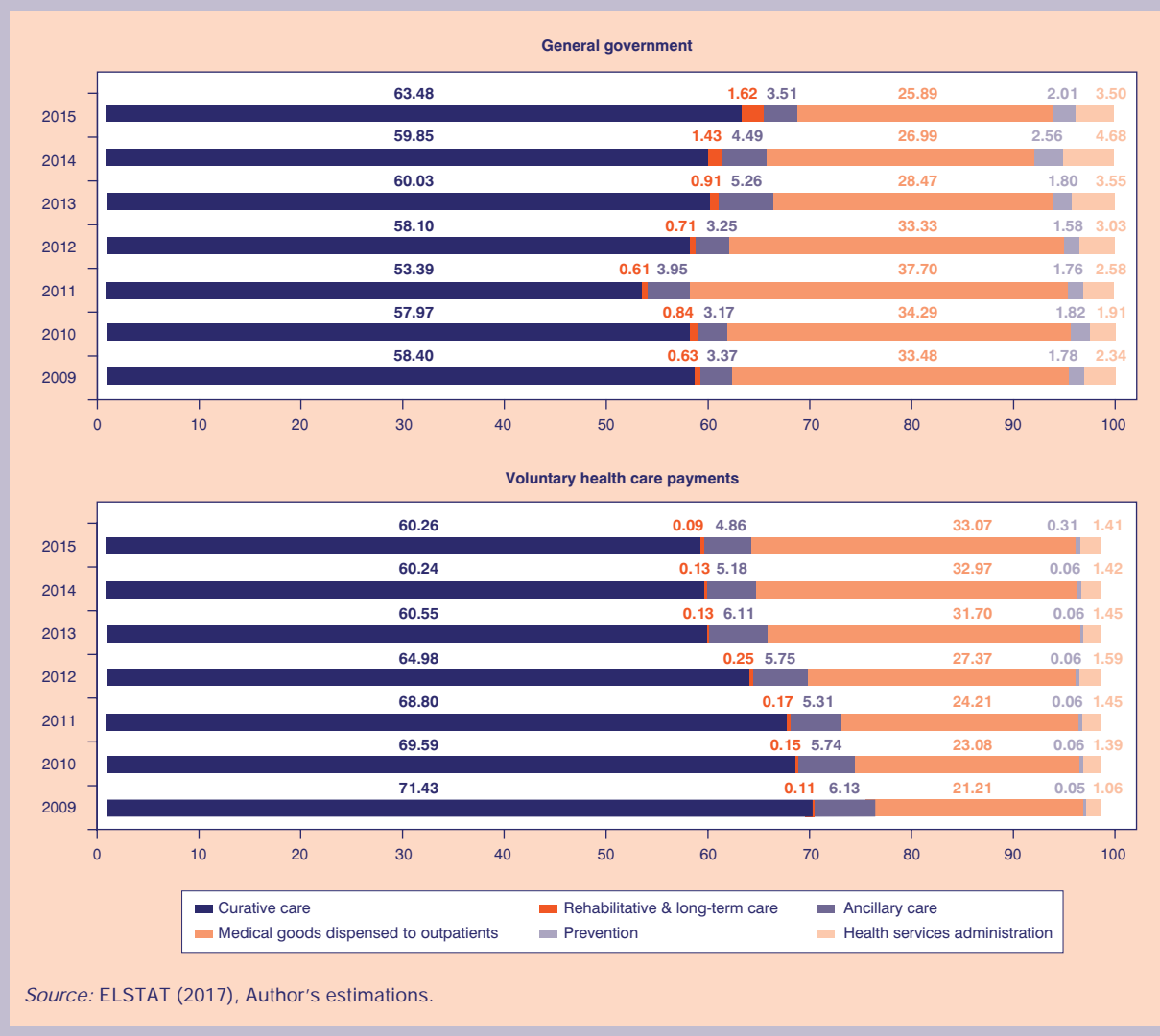
5. The distribution of health care expenditures by health provider

The main providers of health care services are hospitals (public and private), nursing and residential care facilities, ambulatory health facilities such as medical and dental practices, ancillary facilities such as medical and diagnostic laboratories, retailers and other providers of medical goods such as pharmacies and other providers activated in the provision and administration of health programs.

The financing of health care providers at current prices decreased significantly during the period 2009-2014 and increased in 2015 (Table 3). More specifically, hospital expenditures decreased from €9,514 million in 2009 to €6,235 million in 2015, exhibiting -5.6% an-

nual average growth rates. Figure 8 presents the negative evolution of hospital spending until 2014, with the highest reduction (-21.47%) observed in 2010-2011. This reduction could be a result of the combined effect of the implementation of central procurements and cost containment reforms in public hospitals, through their budget control, as well as the cost control of public pharmaceutical spending. However, the share of the hospital expenditures does not seem to vary over time, amounting to 42% of total health expenditures (Figure 9). The general government financed the greater portion of hospitals' spending relative to private/voluntary payments. In 2015, the general government funded hospitals with €4,390 million, reduced by 46% relative to 2009. On the other hand, households and other private agents paid €2,155 million, increased by 41% relative to 2009 (Figure 10). The greater share of funding

	2009	2010	2011	2012	2013	2014	2015
Hospitals	9,514.29	9,209.42	7,290.26	7,497.34	6,463.15	5,909.50	6,235.00
Residential long-term facilities	116.99	140.83	129.14	81.53	62.44	117.69	122.92
Providers of ambulatory health services	4,853.71	4,357.57	3,963.38	2,849.06	2,827.97	2,793.96	3,168.23
Providers of ancillary services	859.02	769.17	749.28	624.88	777.40	645.92	567.24
Retailers and other providers of medical goods	6,588.09	6,632.19	6,189.11	5,245.36	4,433.16	4,108.93	4,169.07
Other providers	558.81	499.52	514.52	482.76	494.39	554.88	469.49
Total health expenditures	**22,490.92**	**21,608.69**	**18,835.69**	**16,780.93**	**15,058.52**	**14,130.87**	**14,731.94**

Source: ELSTAT (2017).

FIGURE 8
Annual growth rates (%) of health expenditure by general category of providers at real prices, 2009-2015

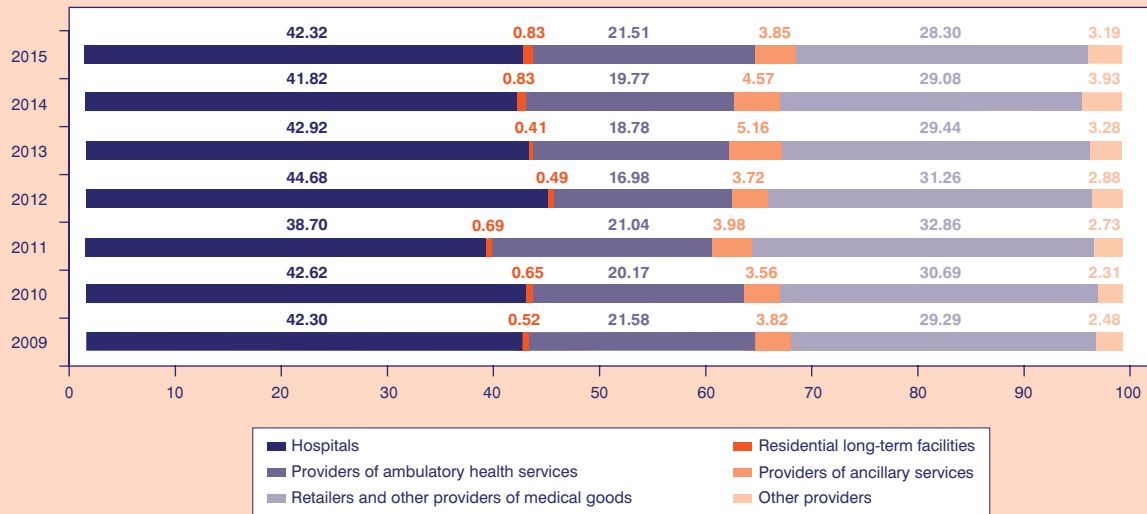*Source:* ELSTAT (2017), Author's estimations.
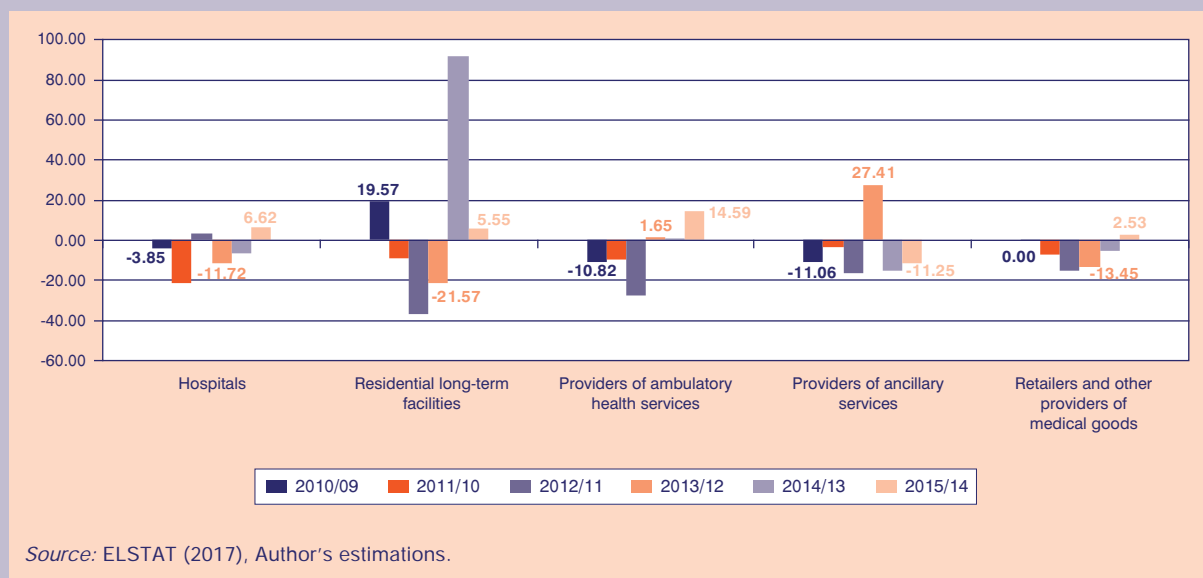
was allocated to general hospitals (36% of total health expenditures approximately) and a much lower share to mental and specialized hospitals (Figure 11).

The financing of retailers and other providers of medical goods decreased from €6,588 million in 2009 to €4,169 million in 2015 (Table 3), exhibiting an annual average negative growth rate of 6.47%. The financing of pharmacies reduced by 34% during the period 2009-2015 due to the implementation of cost containment policies on public pharmaceutical spending (Figure 8). The reimbursement of pharmacies from the general government decreased by 56.30%, while the contribution of household out-of-pocket payments increased by 43.76%, indicating a cost shift from the public to private sector (Figure 10). Pharmacies engaged about 26% of total health expenditures, making pharmacies and hospitals the two main pillars of health care system financing (Figure 11).

FIGURE 9

FIGURE 9
Distribution (%) of health expenditure by general category of providers at current prices, 2009-2012

Year	Hospitals	Residential long-term facilities	Providers of ambulatory health services	Providers of ancillary services	Retailers and other providers of medical goods	Other providers
2015	42.32	0.83	21.51	3.85	28.30	3.19
2014	41.82	0.83	19.77	4.57	29.08	3.93
2013	42.92	0.41	18.78	5.16	29.44	3.28
2012	44.68	0.49	16.98	3.72	31.26	2.88
2011	38.70	0.69	21.04	3.98	32.86	2.73
2010	42.62	0.65	20.17	3.56	30.69	2.31
2009	42.30	0.52	21.58	3.82	29.29	2.48

Legend:
- Hospitals
- Providers of ambulatory health services
- Retailers and other providers of medical goods
- Residential long-term facilities
- Providers of ancillary services
- Other providers

Source: ELSTAT (2017), Author's estimations.

FIGURE 10
Annual growth rates (%) of providers' reimbursement by main financing agents, 2009-2015

General government

Hospitals: -5.94, 6.04, -16.24
Providers of ambulatory health services: 1.60, 20.65, 39.80
Medical and diagnostic laboratories: -14.93, -9.25
Pharmacies: 0.50, 1.87, -26.17

Voluntary health care payments

Hospitals: 7.15, 2.85, 7.83
Providers of ambulatory health services: -15.44, -12.89, -4.78
Medical and diagnostic laboratories: -12.17, 7.97, -4.70
Pharmacies: 4.32, 21.07, 2.36

Legend: 2010/09, 2011/10, 2012/11, 2013/12, 2014/13, 2015/14

Source: ELSTAT (2017), Author's estimations.

Distribution (%) of health expenditure by main sub-categories of health care providers at current prices, 2009-2015

Source: ELSTAT (2017), Author's estimations.
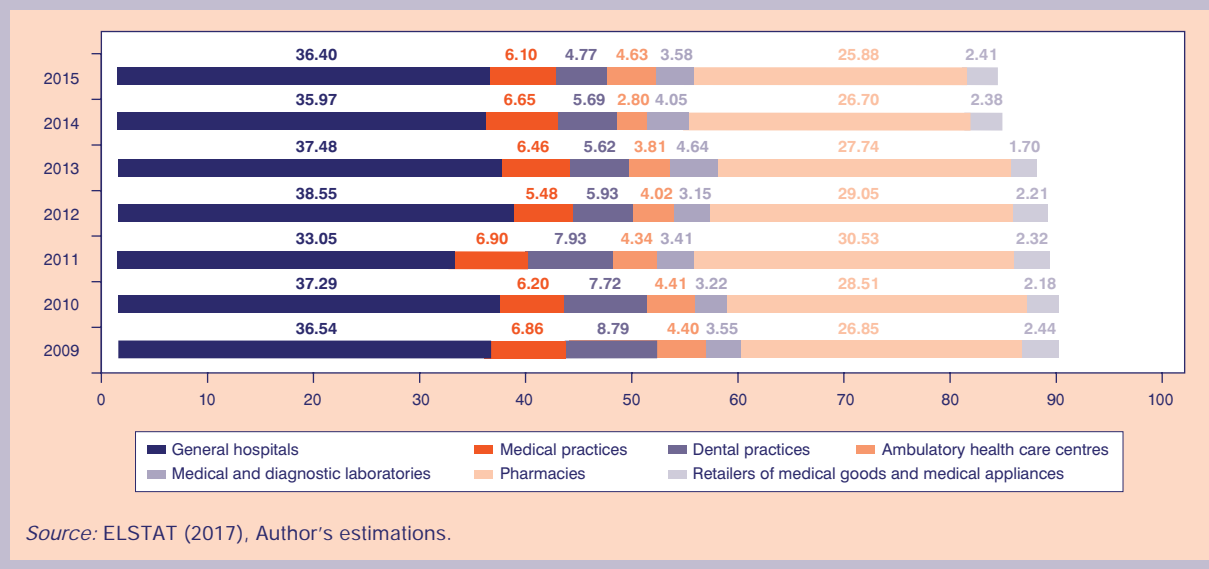
The financing of the ambulatory health care providers, such as medical and dental practices, and the ambulatory health care centers decreased from €4,854 million in 2009 to €3,168 million in 2015, exhibiting an annual average negative growth rate by 5.26% (Table 3) and accounting for 21% of total health expenditures over time. After 2013, the financing of ambulatory health care providers achieved an upward trend, but with a lower growth rate relative to the rapid fall during the period 2009-2012 (Figure 8). The size of funding does not vary significantly between the general government and the private/voluntary payments. However, the establishment of EOPYY as a buyer of health care services and the changes in the reimbursement system of the physicians in primary health care have increased the funding from the general government to ambulatory health care providers by 17.84%, but have decreased the funding from the out-of-pocket payments by 57.31% during the period 2009-2015 (Figure 10). Medical and dental practices' expenditure accounted for 6% and 5% of total health expenditures, respectively. During the economic crisis, the share of dental practices' expenditures decreased by 4 percentage units relative to 2009, while the share of medical practices remained relatively stable.

6. The evolution of health expenditures in European countries

Health expenditures fell or slowed in many European countries as a result of the global economic reces-sion that began in 2009, after a period of continuous growth. European countries were forced to control the cost of health care services after the economic recession. Given that public funds account for around three-quarters of total health expenditures on average across European countries, governments have adopted various structural reforms to increase the efficiency of health care systems, such as adjusting the level of financial resources, regulating the demand for health care and controlling the cost of care (Morgan and Astolfi, 2013; 2014). In the last couple of years, health spending has generally seen a slow but steady increase, albeit at much lower rates compared to the pre-crisis period (OECD, 2016).

In Greece, total health expenditure as a share of GDP accounted for 8.2% in 2016, occupying a position very close to the average of 26 European countries (Figure 12). European countries devoted a total of 8.8% of their GDP, on average, to health care, remaining more or less unchanged during the period 2008-2015. Switzerland, Germany, Sweden and France spent around 11% of GDP on health care services, followed by the Netherlands, Norway, Belgium, Austria and Denmark at 10%. On the other side, Turkey and Latvia are among the countries with the lowest health spending as a share of GDP, 4.3% and 5.7%, respectively. As shown in Figure 13, Greece, Ireland and Portugal experienced one of the sharpest declines in total health expenditure as a share of GDP during the period of economic crisis, in contrast with the average of European countries that remained relatively stable (Figure 13). Ireland occupied the first position among those countries with -3.78% av-

FIGURE 12

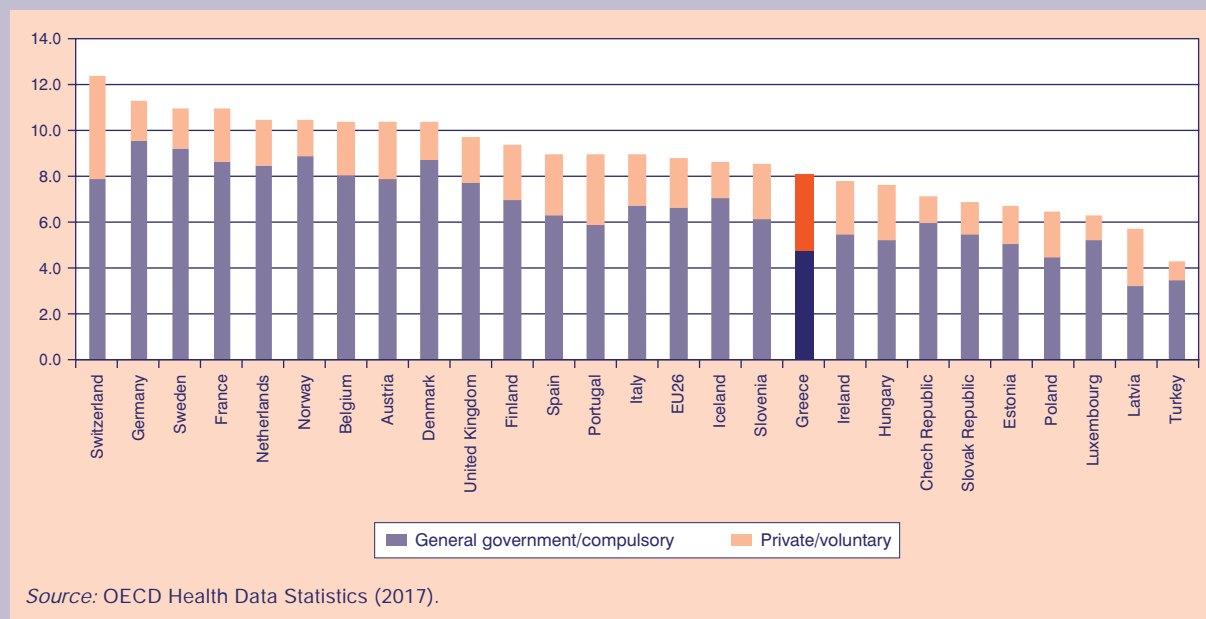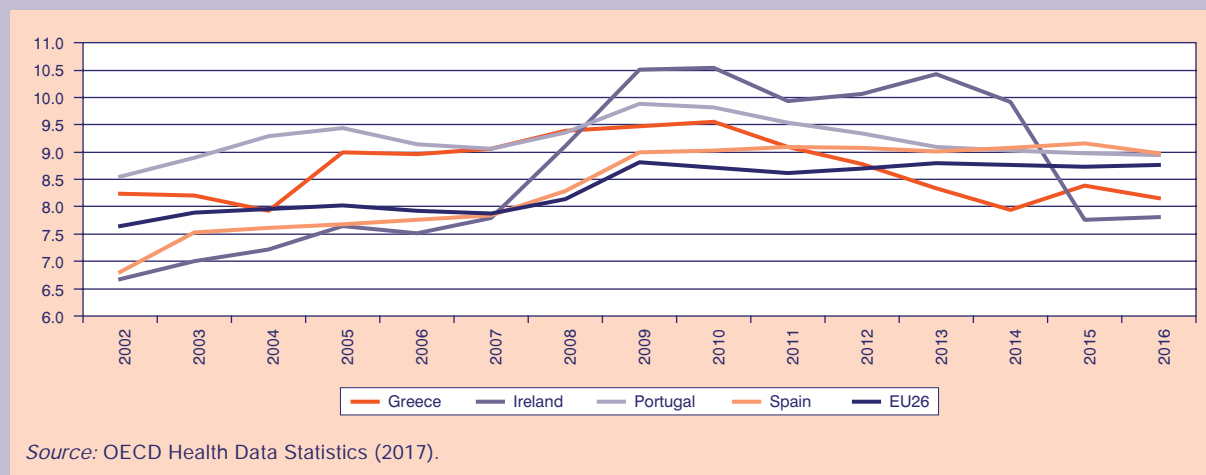**Total health expenditure as a share of GDP, 2016 or nearest year**

■ General government/compulsory   ■ Private/voluntary

Source: OECD Health Data Statistics (2017).

FIGURE 13

Evolution of health expenditure as a share of GDP, selected European countries, 2002-2016

— Greece   — Ireland   — Portugal   — Spain   — EU26
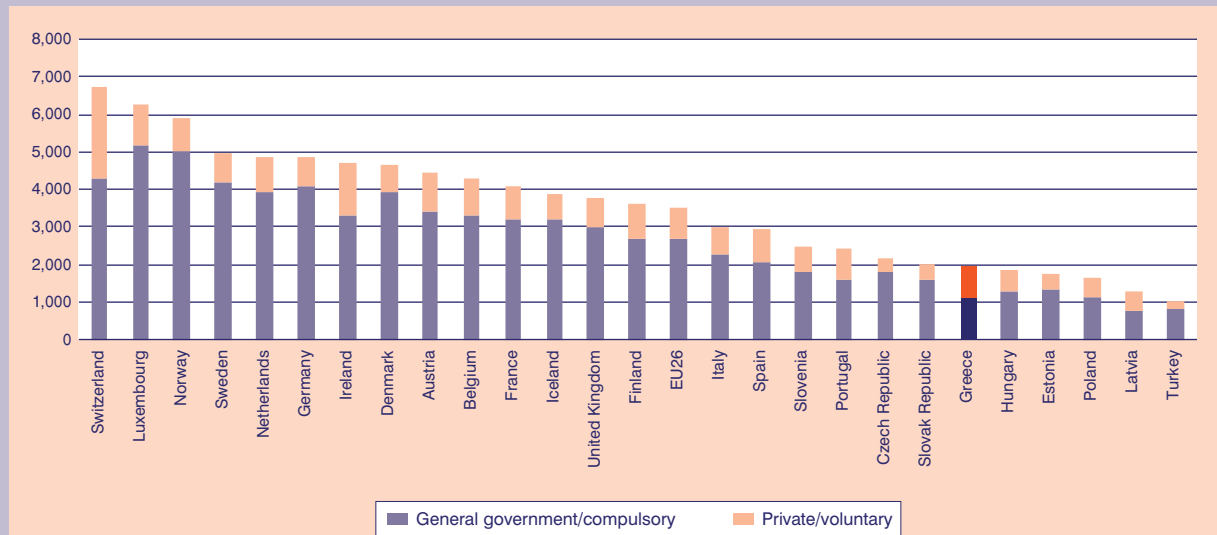
Source: OECD Health Data Statistics (2017).

erage annual growth rate during the period 2009-2016, followed by Greece with -2.02% and Portugal with -1.40%. On the other hand, Sweden increased total health expenditures by 3.40%, Norway by 2.11% and the United Kingdom by 1.99% (OECD, 2017).

Concerning health expenditure per capita at real prices, we can observe that high-income countries spent the most on health in 2016 (Figure 14). Switzerland (€6,718), Luxemburg (€6,246) and Norway (€5,887) were the European countries with the highest spending. Greece was below the average of 26 European countries (€3,518) with €1,937. At the other end of

the scale, Turkey (€1,006) and Latvia (€1,300) were the lowest per capita spending countries among European countries. In the European Union as a whole, health expenditures increased by only 0.7% annually in real terms during the period 2009-2015 relative to 3.1% between 2005 and 2009 (OECD, 2016). Greece experienced one of the biggest reversals of health expenditure growth (Figure 15). During the period 2005-2009, per capita health expenditure averaged a 4.08% annual growth rate. With fiscal consolidation in place, health expenditure per capita has seen an average annual negative growth rate of 5.09% since 2009. Portugal, Spain and Slovakia have also experienced signif-

FIGURE 14
Health expenditure per capita at constant PPPs prices, 2016 or nearest year (US dollars)

Legend: ■ General government/compulsory   ■ Private/voluntary

Source: OECD Health Data Statistics (2017).

FIGURE 15
Annual average growth rates in per capita health expenditure, constant PPPs prices, 2002-2016

Legend: ■ 2009/02   ■ 2016/09
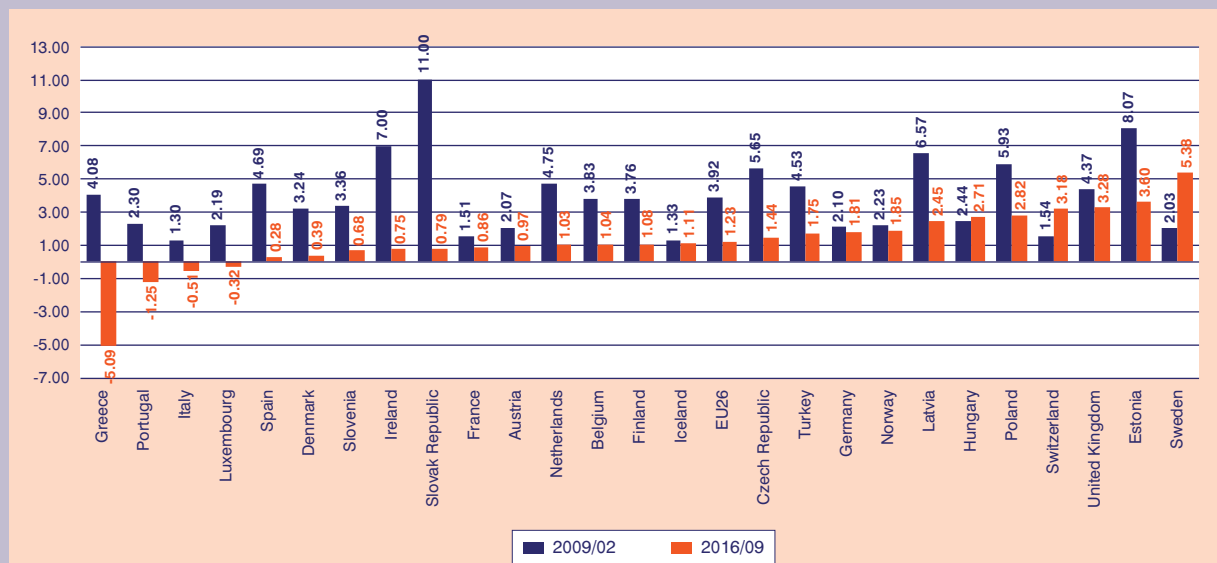
Source: OECD Health Data Statistics (2017).

icant negative growth in per capita health expenditure since the onset of the crisis.

7. Concluding remarks

Reeves *et al.* (2014) argued that the analysis of cross-national data in Europe does not show a clear relationship between health care cuts and economic recession. Some countries have raised total health spending in the face of increasing population needs, while another group of countries has allowed health expenditures to rise as a measure that would facilitate improvement in the quality and accessibility of health services, aiming to foster economic growth. On the other hand, some countries appear to have substantially reduced government health spending, arguing that fiscal consolidation would promote future growth. More specifically, Greece, Ireland, Spain and Slovenia

implemented large reductions in health spending in real terms, while the Netherlands, France and Switzerland have allowed real levels of health expenditures to increase.

In Greece, the economic crisis has led to the adoption and the implementation of various structural reforms aiming to the rationalization of the health care system. The initial target of the general government was that the public expenditure for pharmaceutical products dispensed to outpatients should not exceed 1% of GDP, i.e. approximately €2 billion euros (in accordance with the average level of EU countries) and the total public pharmaceutical spending (inpatient and outpatient) should not exceed 1.3% of GDP in 2014 (Memorandum of Understanding, May 2010). In order to achieve this target, Greece has legislated a series of measures, such as the implementation of an external reference pharmaceutical pricing policy according to the best practice policies in Europe, the revision of negative and positive drug lists, the implementation and control of e-prescribing, the introduction of central procurements, the expansion of generics consumption, the profit reduction of retailers and wholesalers of medical goods and the introduction of rebates and clawbacks. Simultaneously, the government established EOPYY as a buyer of health care services and redefined the reimbursement system of physicians in primary health care. Concerning the public hospitals, the government developed cost accounting systems and DRGs and restructured the health administrative services, aiming at cost savings. According to the most recent revision of the Memorandum of Understanding (July 2017) the authorities have committed to continue reforming the health care sector, controlling public expenditures, managing prices of pharmaceuticals, improving hospital management, increasing centralized procurement of hospital supplies, managing demand for pharmaceuticals and health care through evidence-based e-prescription protocols, commissioning private sector health care providers in a cost effective manner, modernizing information technology systems and developing a new electronic referral system for primary and secondary care that allows for the formulation of care pathways for patients.

During the period of economic recession and after the implementation of a number of structural reforms, the health expenditure of the general government fell significantly, albeit at a rapid increase achieved to the pre-crisis period. On the other hand, the private/voluntary health expenditure fell during the period 2010-2012 but recorded an upward trend with diminishing growth rates afterwards. According to Thomson *et al.* (2014), Greece is among the countries where the per capita health expenditure decreased significantly,

reaching 2007 levels. A great portion of the aforementioned reduction was due to the shrinkage of the general government's health spending as a result of restructuring the health system and the implementation of structural reforms. In 2015, total health expenditures increased for first time after 2009.

The inpatient and outpatient health care services (mainly general hospitals) as well as the provision of medical goods (mainly pharmaceuticals) constitute the main components of total health expenditures. These were financed mainly by the general government, the social security organizations and household's out-of-pocket payments.

The contribution of compulsory health insurance from social security organizations reduced significantly during the period under consideration, mainly due to the pharmaceutical spending cuts. The establishment of EOPYY, the introduction of e-prescribing, the revision of the positive list, the implementation of the external reference pharmaceutical pricing policy, the introduction of clawbacks and rebates had as a result the compulsory health insurance spending to reduce with a greater growth rate relative to the other agents that fund the health system.

According to Morgan and Astolfi (2014), the reduction in the public pharmaceutical spending contributed to around 1/3 of the overall reduction in the public health budget in 2009-2011, helping to reduce the overall Greek public deficit by the equivalent of 1% of GDP. Furthermore, Greece occupies the first position among countries with significant cuts in the financing of preventive and public health. On the other hand, the private/voluntary pharmaceutical expenditures increased significantly, while spending for ancillary care services decreased. The positive change of private/voluntary health expenditure might be due to the fact that the implementation of structural reforms, such as increased cost-sharing of insurers for specific categories of drugs and the expansion of the negative drug list, has shifted the financing burden from social security organizations to households. The reduction of household disposable income and the high rates of unemployment negatively influenced the upward trend of private/voluntary payments for outpatient health care facilities such as medical and dental practices, medical and diagnostic laboratories and private clinics.

The analysis of health care spending during the period 2009-2015 demonstrates a clear reduction in total health expenditures. As the result of this reduction, the size of total health expenditure as a share of GDP has reached the level of 2002, and the general government spending has achieved the highest decline relative to private/voluntary payments. Simultaneously, a redistri-

bution of health expenditure shares from the general government to households is observed. Households seem to pay for the reduction in public pharmaceutical spending while the general government spent a higher amount for outpatient and ancillary care of citizens.

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Migration flows and fiscal impact: A first approach

Christos Triantopoulos*

1. Introduction

In 2015, in the midst of a difficult economic and fiscal sentiment, Greece was faced with the need to manage the particularly high flows of migrants and refugees arriving in the country via the Mediterranean Sea and, in particular, through the Aegean islands. This was a complex and multifaceted phenomenon with strong geopolitical, humanitarian, social, political and economic dimensions, and special implications at the European level, as the destination of these migrants and refugees was the most developed European economies and, in particular, the European North (IMF, 2016). The gradual spread of the phenomenon, combined with the institutional and organizational weaknesses of the European Union (EU) with regard to its coherent and timely management, allowed it to be transformed into a (new) crisis for the EU. Being the main entrance point for the migration and refugee flows to EU member states, Greece has played a key role in the wider context of refugee crisis management. The same goes for Italy.

In particular, with regard to Greece, according to the Office of the United Nations High Commissioner for Refugees (UNHCR), the total number of refugees and migrants that arrived through the Mediterranean Sea reached 856,723 in 2015, representing around 8.2% of the country's population and an increase of 1988% compared to the previous year (Figure 1). Most of the arrivals of refugees and migrants (mainly from Syria, Iraq and Afghanistan) via the Mediterranean Sea took place in the second half of 2015, the peak being observed in September 2015 when the arrivals amounted to 211,663. The phenomenon, however, began to gradually decline after the EU's agreement with Turkey (March 2016) and the numbers of refugees and migrants arriving to the country were considerably reduced in relation to the previous period (Kavounidis, 2017). According to UNHCR data, in 2016 arrivals of refugees and migrants through the Mediterranean Sea amounted to 173,450 (87% taking place in the first quarter of the year), while for the eight-month period of 2017 (on 27/8/2017), these arrivals reached (only) 14,656, which is lower than the corresponding size for the same period of 2014 (arrivals in the period January - August 2014 amounted to 20,284). As a whole, for the period January 2014 - August 2017, arrivals of refugees and migrants through the Mediterranean amounted to 1,085,867.

FIGURE 1
Arrivals of refugees and migrants in Greece through the Mediterranean Sea

Source: UNCHR.

Note: The data of August 2017 cover the period until 27/8/2017.

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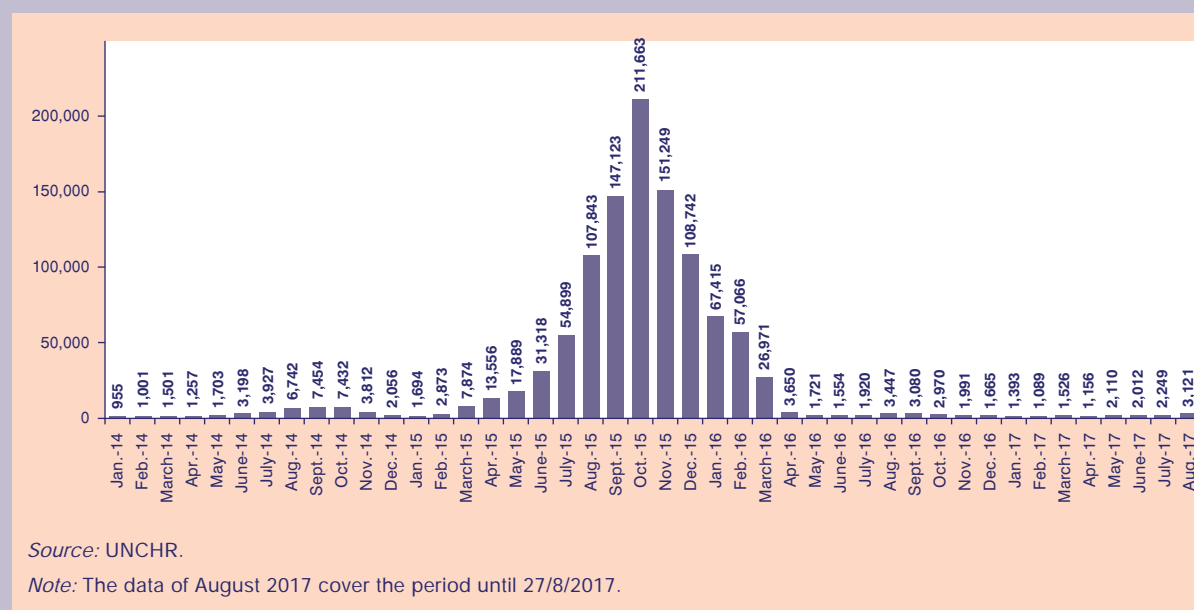
* Research Fellow, Centre of Planning and Economic Research (KEPE).

FIGURE 2

Arrivals of refugees and migrants in Italy through the Mediterranean Sea

Source: UNCHR.

Note: The data of August 2017 cover the period until 30/8/2017.
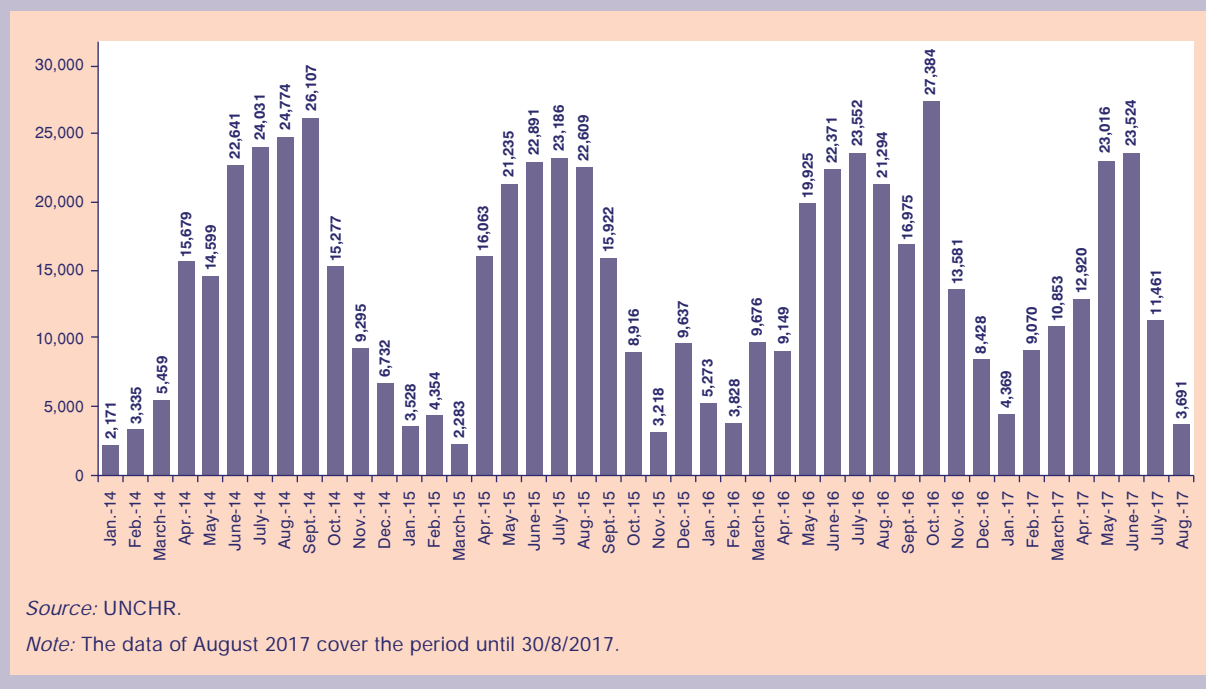
Unlike Greece, Italy has not shown any significant outbreak in recent years, maintaining a relative seasonality in the intensity of flows of refugees and migrants through the Mediterranean –which is also largely affected by weather conditions (Figure 2). Thus, the number of refugees and migrants arriving in Italy through the Mediterranean Sea stood at 170,000 in 2014, decreased to 153,842 in 2015, rose again to 181,436 in 2016, and stood at 98,904 in the first eight months of 2017.

The management of the increased flows of refugees and migrants, alongside the humanitarian, social and geopolitical dimension, has a significant fiscal dimension related to the direct and indirect impact on public finances, determined by both the intensity and the phase of the phenomenon. This fiscal impact, in spite of the inherent weaknesses linked to it (e.g. extraordinary circumstances, stakeholder fragmentation, involvement of different countries, etc.) is rather useful to be captured, quantified, underlined and monitored separately, in order to contribute to the effective exercise of this policy. The separate monitoring of the fiscal implications of the migration policy is even more essential for countries such as Greece, which are undergoing (rigorous) fiscal adjustment and stabilization (Triantopoulos, 2015). Within the framework of the EU, therefore, the distinct full and detailed monitoring of the fiscal impact of managing the refugee flows is of particular importance, because –given the (European)

specificities of the phenomenon and the Greek fiscal situation– it allows some sort of fiscal 'aid' to be established for Greece, corresponding to the size of the impact (Ministry of Finance, 2016). In particular, this fiscal 'aid' can arise either by increasing EU (regular and emergency) funding to the country, excluding the budgetary impact related to the management of the phenomenon from the fiscal targets (the adjustment program), or by relaxing the rigor of the fiscal targets that are in place due to the extraordinary circumstances. At the same time, the distinct fiscal monitoring of the refugee crisis management allows for the development of fiscal scenarios with regard to both its course (e.g. the possible increase in flows) and its evolution (e.g. increase in inventory).

The present article, after discussing the theoretical background: (a) analyzes the initiatives and procedures adopted in Greece in the context of the need to distinguish the fiscal impact of managing increased refugee and migration flows, (b) discusses the fiscal data relating to each of the fiscal impact quantification approaches, and (c) concludes in proposals on improving the current situation.

2. Theoretical background

The identification of the fiscal impact of refugee and migration flows management, according to the relevant theoretical background, can be realized through three

basic approaches, the use of which is determined by the special conditions related to the phenomenon and the data that are available (Ministry of Finance, 2016). The first approach is that of accounting, which is the direct (static) calculation of the impact of migration as evidenced, on the one hand, by the taxation and insurance contributions of migrants (if they join the labour market); and, on the other hand, by the public expenditure related to migrants and to the overall management of the phenomenon (OECD, 2013). The second approach is that of dynamic models, which identifies the long-term impact of migration –also taking into account the generations that followed the first immigrants– through the calculation of its future impact on public finances, focusing *inter alia* on different dimensions of public finances, such as public debt and the sustainability of the pension system (Lee and Miller, 1997; Ekberg, 2011; Auerbach, Gokhale and Kotlikoff, 1991; OECD, 2013). The third approach is that of macroeconomic models, which deals with the assessment of the overall impact of migration on the economy, focusing –through the use of computational models of general equilibrium– on analyzing the impact (for a determined period of time) of changes in migration policy and changes in refugee flows in fields such as social spending and the budget (Chojnicki *et al.*, 2011; OECD, 2013).

The fiscal impact –regardless of the method of calculation– may be (a) direct, resulting from the public expenditures reflected in the budget and related to state subsidies to stakeholders, commissions, new activities, projects, infrastructure, but also the provision of related services; and (b) indirect, as determined by the fiscal cost associated with the public services provided by the state to the entire population (e.g. increasing the number of pupils in school classes, increasing incidents in hospitals, etc.) (Nasser and Symansky, 2014; Ministry of Finance, 2016).

Among the three approaches, the one that can capture, in the short-term and in real time, the fiscal impact of refugee and migration flows –so that the impact of the flows at the time of passing through the country to other destinations can be included– is the accounting approach; the two other methods of measuring the fiscal impact (dynamic and macroeconomic models) approach the phenomenon of migration with one (at least) medium-term (if not long-term) dimension, focusing in particular, on the accommodation and integration of migrants in the country of destination and not so much on the country used as transit to the final destination (Ministry of Finance, 2016). Of course, accounting can also be developed in a mid-term analysis framework. Therefore, the choice of the appropriate method is dependent largely on the phase of the refugee and migration phenomenon, in addition to the

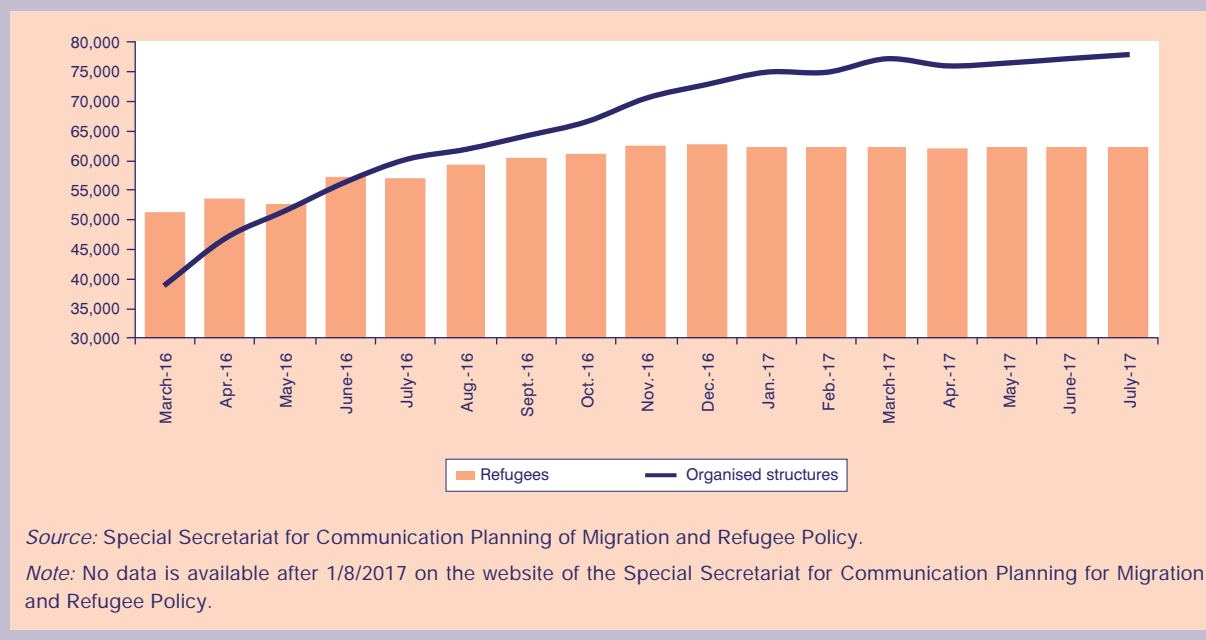availability of relevant data and the credibility of the data collection processes.

In particular, the key phases of this phenomenon are three, starting from the moment refugees and migrants enter (illegally) the country: The first phase is when the country –as a point of first reception and transit to the final destination– manages these arrivals, in the context of the mobility of refugee and migrant flows, and provides temporary hospitality, assistance and care. The second phase is when the country –acting as a place of temporary accommodation– manages, in the context of a possible "obstruction" of flows of refugees and migrants to other countries, the (temporary) accommodation of such arrivals and creates hospitality conditions until the host state asylum framework is implemented (e.g. asylum applications examined, etc.), also facilitating their transit to the final destinations. The third phase is when the country –as a place of permanent settlement– deals with integrating refugees and migrants, as well as their future generations, as part of the development of a wider immigration policy (Triantopoulos, 2015; Ministry of Finance, 2016).

Therefore, since the suitability of the method of determining the fiscal impact of refugee and migration flows is also influenced by the phase of the phenomenon, it appears –through the correlation between the phases of the phenomenon and the proposed methods– that, during the first phase of managing flows of refugees and migrants (that is, when the country is the first point of arrival and a transit country to the final destination) the most appropriate approach is that of accounting, especially when the measuring of the impact is attempted in real time and with the phenomenon being in progress. However, as the evolution of the phenomenon enters the second phase and heads towards the third phase (that is, when the country is a point of temporary hospitality or [ultimately] the final destination) the conditions are met for either the dynamic models or the macroeconomic models to be used, since more relevant data are becoming gradually available and the phenomenon can be integrated into the macroeconomic environment of society and the economy (e.g. permanent accommodation, integration measures, etc.). In the same direction, as the management of the phenomenon moves towards the third phase, the scope for indirect fiscal burdens is widened as it relates to the whole process of integrating refugees and migrants flows (Ministry of Finance, 2016).

3. Distinct recording of the fiscal impact

In the case of Greece, the phenomenon of increased refugee and migration flows through the Mediterranean Sea was identified, until the beginning of 2016

FIGURE 3
Hospitality structures and refugees and migrants staying in Greece

Source: Special Secretariat for Communication Planning of Migration and Refugee Policy.

Note: No data is available after 1/8/2017 on the website of the Special Secretariat for Communication Planning for Migration and Refugee Policy.

(since 2015), as being (mainly) in the first phase, i.e. the country being used as a transit country for the flows of refugees and migrants crossing towards other final destinations (especially northern Europe). So, at that stage (and at that time) the most feasible and effective approach to capture the fiscal impact of the phenomenon –also taking into account structural weaknesses in the availability of relevant data and the dynamic evolution of the phenomenon– was the accounting approach (Ministry Finance, 2016).

Gradually, however, after the flow to different final destinations (the developed economies of northern Europe) was "obstructed", following the decision of the governments of these member states to tighten their border policy ("closing" the passages), the management of the phenomenon in Greece began gradually to move toward the next two phases, since a significant number of refugees and migrants remained in the country –either (initially) pending departure, or (subsequently) with the prospect of permanent residency.

More specifically, according to the data of August 1, 2017 by the Special Secretariat for Communication Planning for Migration and Refugee Policy (created exclusively for this information), the number of refugees and migrants remaining in the country –alongside the operation of the European redistribution mechanism for refugees, volunteer returns and departures to Turkey– amounted to 62,206 (from 51,393 in March 2016), while the total nominal capacity of the various hospitality structures across the country

is estimated at around 78,000 (from 39,000 in March 2016) (Figure 3).

Thus, according to the new data (as the phenomenon is being managed as being at its third phase), the appropriate methods of calculating and recording the fiscal impact of refugee and migration flows management are the dynamic and macroeconomic models so that long-term impacts are integrated into the results, in the framework of the wider macroeconomic environment, and various scenarios are possible.

In any case, the basis for the development of dynamic and macroeconomic models is to adequately depict in accounting the fiscal impact of the phenomenon, making the effort launched in 2015 significant.

The need for a distinct recording of the fiscal impact related to the management of the phenomenon was identified from the start, and so were the difficulties in reaching a reliable result (Triantopoulos, 2015; Ministry of Economy, Infrastructure, Maritime and Tourism, 2015). In particular, the determination of the fiscal impact –at the outset of the phenomenon– was faced with the following problems (Ministry of Finance, 2016):

(a) The absence of a separate fiscal record of public spending related to the phenomenon; the involved entities and stakeholders and the central body responsible for the fiscal management not having –initially– precise fiscal data.

(b) The multidimensional nature of the phenomenon, since it addresses different fields of politics, so-

ciety, economy and public administration, and is therefore linked to various stakeholders at central, regional and local levels, and has a strong geopolitical and European dimension.

(c) The particularly large scale and the dynamics of the phenomenon, as, on the one hand, the flows of refugees and migrants have shown a large upward trend and, on the other hand, the data related to the flows show a particular variability.

(d) The absence of mapping the full range of services and actors involved in managing the phenomenon so that there is a comprehensive picture of the structure of the state mechanism that implements the expenditure and, by extension, of the types of expenditure involved.

(e) The weaknesses, at the state level, related to adequate co-ordination of the management of the phenomenon, as a result of the competent Ministry's short life, the continuous involvement of new entities and services, the transfer of responsibilities between ministries and the involvement of many bodies and actors at national, regional and local levels.

The first attempt, in the direction of a distinct recording of the fiscal impact of the increased refugee and migration flows, was made by the Greek state in October 2015, when the recording of the relevant expenditure was established by the General Accounting Office (GAO) through questionnaires that were sent to the ministries and/or other entities of the General Government. This is, in particular, a questionnaire that (a) covers all related (ordinary and investment) expenditure of ministries, local authorities, public enterprises and organizations, legal persons, hospitals and social security organizations; (b) is regularly completed by the competent Directors-General for Financial Services (c) includes other –in addition to fiscal– quantitative data related to the management of the phenomenon (e.g. number of incidents, number of vehicles involved, etc.); (d) includes the provision of fiscal data that may be included in the alternative costs of managing the phenomenon (e.g. wages, etc); and (e) includes the estimates of the competent services for each year – depending on the scenarios that are in place on the evolution of the phenomenon for the year in question.

This particular method of recording contributes to forming an initial picture of the fiscal impact, aggregating data for the General Government as a whole, calculating the costs that cannot be separately recorded (e.g. fuel, wages, etc), providing various quantitative data and, projecting different scenarios. At the same time, alongside the positive results of this record-

ing approach, a number of (significant) weaknesses can be observed, such as the existence of overlapping data, mistakes and omissions with regard to the data entered in the questionnaires and the large and continuous need for coordination (between DGs and other entities) and crosschecking of the data entered. During the first phase of the implementation of this method, the temporary (until the first quarter of 2016) involvement of scientific bodies such as the Centre of Planning and Economic Research (KEPE), the Council of Economic Experts (SGC) and the Prime Minister's Economic Office in the coordination and processing of data (collected by the General Accounting Office-GAO), ensured the production of reliable results and the projection of reliable scenarios regarding the evolution of the phenomenon and its corresponding fiscal repercussions.

The second attempt to make a distinct calculation of the fiscal impact of managing the refugee and migration flows phenomenon involved the establishment, from April 2016, of special bodies for the recording of the expenditure related to the phenomenon monitored by the General Accounting Office. This is, in particular, a distinct accounting method for the relevant expenditure where (a) expenditure on refugee and migration flows is directly recorded; (b) only the structures of the ordinary budget of the State Budget are included and direct monitoring of the course of these costs –within the relevant (budget) limits– is possible. This particular approach allows a more accurate recording of the related costs, the direct recording of expenditure and the immediate availability (from the relevant information system) of the data. At the same time, however, this method does not allow the recording of expenditures beyond the ordinary budget of the State Budget, the recording of expenditure that cannot be distinguished (e.g. wages, fuel, etc.), the utilization of other quantitative data, or the formation of scenarios and assessments on the course of the phenomenon. In this context, the establishment and operation, from January 2017, of a distinct ministry (the Ministry of Migration Policy) responsible for the management of the refugee and migration flows should be taken into account. Thus, the expenditure of the ordinary state budget for migration flows, along with including the Ministry of Migration Policy in the special entities, also includes its operational costs.

The next stage (the third) related to the calculation of the fiscal impact of the phenomenon is related to the (regular and exceptional) resources coming from the EU to address the phenomenon, as part of the Public Investment Budget (PIB) (outside the ordinary budget), which contribute decisively to the financing of the needs arising from the management of the phenome-

non. In this context, in April 2017, the Special Secretariat for the "Coordination and Management of Asylum, Immigration and Integration Fund, Internal Security Fund and other Funds (TAMETEAAP)" was set up at the Ministry of Economy and Development to ensure a more effective management of the relevant EU funds (see L. 4375/2016). According to the initial rationale of the establishment of this Special Secretariat, its mission is "... *the efficient coordination, supervision and acceleration of the actions of the Ministry and the entities involved, the management of the resources related to the Common European Asylum System, the integration of third-country nationals and legal migration, the return, the management of external borders and the common visa policy, and the conduct of a political dialogue in these areas ...*" its aims also including "*[...] the use of other resources, including emergency aid resources related to managing migration flows and other migration issues [...].*"

4. Available fiscal data

In the context of the aforementioned actions and institutional changes that have taken place over the last period, the data for the calculation of the overall fiscal impact of refugee and migration flows can (theoretically) be derived from three distinct, overlapping and non-harmonized data sources: (a) the completed General Government questionnaires, (b) the recording of ordinary budget expenditures in special entities and of operating expenses of the Ministry of Migration Policy, and (c) regular and exceptional financial assistance from the EU (see Public Investment Budget) and the Special Secretariat for TAMETEAP (Figure 4). Nonetheless, despite the development of these three sources of data collection on refugee and migration flows, reliable estimates for the fiscal impact are still not feasible (on the basis of current data) as: (a) the logic of recording data is not fully harmonized among the three sources, (b) there is an overlap between procedures and sources (especially between the questionnaire and the other two); and (c) there are no procedures in place to ensure that the relevant data are logged in all three sources (e.g. coordination of several stakeholders and structures) and that processing the data is in a commonly usable form.

The process of recording expenditure and making estimates via questionnaires to the General Accounting Office, although it is still in place, including also the sub-sectors of the General Government, no longer provides reliable and useful data because: (a) the initial coordination between the parties concerned was not maintained, (b) there is no further processing and control of the data provided (e.g. detection and correction of overlaps, identification of omissions, etc.), and (c) the questionnaires were not revised to follow developments in the other two data sources. Thus, in addition to the scenarios developed in the first quarter of 2016 in the relevant study of the Council of Economic Advisors, the Economic Office of the Prime Minister, the Centre of Planning and Economic Research, the General Accounting Office, the Bank of Greece and other stakeholders (Ministry of Finance, 2016), there are no other available data.

The second data source, the recording of ordinary state budget expenditure in special entities, provides reliable fiscal data, which along with the operational expenditure of the Ministry of Migration Policy compose the (earmarked) expense for migration flows that is excluded –as an outcome of the negotiations that took place in the first half of 2016– from the programs target fiscal surplus. Thus, according to the Medium-Term Fiscal Strategy Framework (MTFS) 2018-2021 data, in 2016, the expenditure on refugee and migration flows stood at just EUR 30 million from the initially budgeted EUR 71 million. This expenditure is pro-
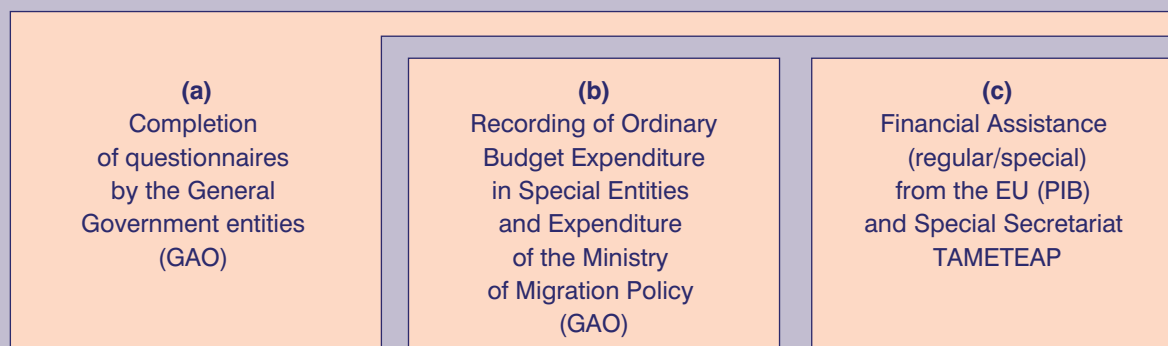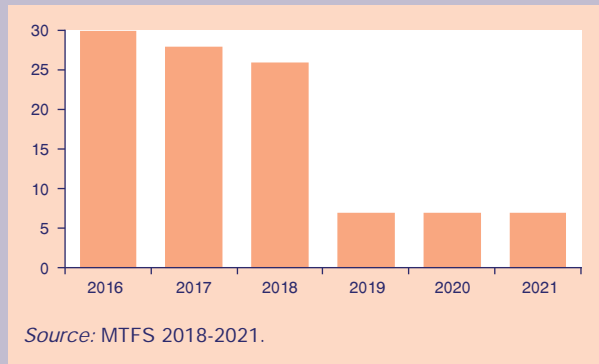
FIGURE 4
Data sources for refugee and migration flows

(a) Completion of questionnaires by the General Government entities (GAO)	**(b)** Recording of Ordinary Budget Expenditure in Special Entities and Expenditure of the Ministry of Migration Policy (GAO)	**(c)** Financial Assistance (regular/special) from the EU (PIB) and Special Secretariat TAMETEAP

FIGURE 5
State expenditure on migration flows

Source: MTFS 2018-2021.

FIGURE 6
Agreements on emergency EU funding

Source: European Commission.

Note: The data refer to the period until 26/7/2017.

jected to decrease, reaching EUR 7 million from 2019 onwards (Figure 5). This is, however, an expenditure which –as already noted– does not include costs that can not be distinguished from the whole (e.g. wages, fuel, etc.) and, of course, does not concern the whole of the General Government.

Finally, the EU funding, regular or emergency (which covers the larger part of the costs related to the management of the phenomenon), is channeled either through the public sector or through the private sector (e.g. non-profit organizations and non-governmental organizations). Overall, the financial assistance to Greece for the management of refugee and migration flows (or "refugee crisis"), according to the European Commission data of July 2017 (26/7/2017), was set at 871.3 million euro (European Commission, 2017). This financial 'aid' is analysed as follows:

(a) EUR 509.5 million is the regular EU funding for the period 2014-2020, of which (1) EUR 294.6 million comes from the Asylum, Migration and Integration Fund (AMIF), (2) EUR 194.3 million comes from the Internal Security Fund (ISF), and (3) EUR 20.5 million comes from the Internal Security Fund (Police).

(b) EUR 361.8 million constitutes emergency EU funding, of which (1) EUR 124.8 million comes from the Asylum, Migration and Integration Fund, (2) EUR 55.8 million comes from the Internal Security Fund and (3) EUR 181.2 million constitutes emergency assistance to international non-profit and non-governmental organizations, also from the Asylum, Migration and Integration Fund and the Internal Security Fund (Figure 6).

Of a total amount of EUR 871.3 million, EUR 395 million had been disbursed by July 2017, with an absorption rate close to 45%, while it is worth noting that by the end of January 2017 341.1 EUR million (out of EUR 395 million) was spent, while most of the relevant agreements were made in 2016.
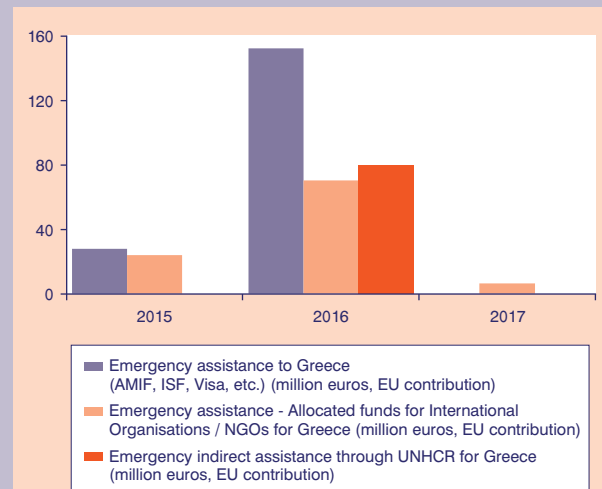
Finally, for the period 2016-2018 the EU has developed an emergency humanitarian aid framework through the Emergency Support Instrument to address the refugee crisis through non-profit and non-governmental organizations. This is a special financial assistance totaling EUR 700 million, of which EUR 401 million has been contracted by the end of July 2017, a substantial part of which concerns also the activity of non-governmental and non-profit organizations in Greece (along with the aforementioned funding).

5. Concluding remarks

In conclusion, as described in detail above, significant administrative initiatives concerning the distinct recording of the fiscal impact of refugee and migration flows management have been promoted and implemented in recent years –under the pressure, of course, of the developments and conditions created by the phenomenon under consideration. These initiatives and procedures, firstly, allowed the development of "static" scenarios (in the initial phase of the phenomenon) and, subsequently, the drawing of corresponding resources from the EU financial assistance channels and the exception of the relevant fiscal impact from the targets included in the fiscal adjustment program that the country follows regarding the primary surplus.

However, there are significant weaknesses observed –due to the incompatibility and the non-harmonization of sources– regarding a more concise (and distinct) assessment of the fiscal impact of the management

of the incremented refugee flows. These weaknesses are of particular importance since this phenomenon is in the third phase of its development (a significant number of refugees and migrants being permanently settled in Greece) and it is now necessary to utilize dynamic and macroeconomic models in order to capture and record the wider (long-term) impact of the phenomenon on both the public finances of the country and the economy as a whole.

In this direction, some interventions supplementary to the initiatives that have been developed in recent years would be rather useful, such as:

(a) Enriching and widening the process of (distinct) recording of the fiscal data related to the refugee phenomenon across the General Government through the utilization of relevant IT infrastructure.

(b) Improving the consistency of the sources of fiscal data, focusing mainly on the questionnaire process so that there are no overlaps, gaps and ambiguities, thus also allowing for other quantitative data to be exploited, and also allowing for reliable estimates and scenarios to take form.

(c) Creating a reliable basis of fiscal and administrative (other quantitative) data to allow for the development of a dynamic analysis of the long-term impact of the phenomenon.

These proposals are, in essence, related to administrative interventions (on current procedures) that will allow for a more comprehensive picture on the fiscal impact of the phenomenon to be shaped, while contributing to the development of assessments and scenarios for the evolution of a phenomenon which is critical for both the economy and the society.

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